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# ABOUT THE JOURNAL

The International Journal of Education and Ethical Issues in Research (IJEEIR) is an academic, professional and peer reviewed journal published by the Faculty of Education, University of Uyo, Akwa Ibom State, Nigeria. Two issues in one volume of the journal shall be published twice a year (May and November) in English.

The researches published in this journal is aimed at extending the frontiers of knowledge and understanding in all areas of educational activity and from all perspectives including learners, educators, policy makers and the public. Educational researches (theoretical and applied research papers) published will be those in which Authors adhere to ethical principles while presenting contemporary issues in Nigeria, Africa and global settings.

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- 3. The cover page should contain the title of the article, author's name, mailing address/academic affiliations, e-mail and phone number(s) or only that of the corresponding author in case of multiple authors.
- 4. The abstract should be precise, with not more than 250 words, typed in single line spacing. Only 3-5 keywords are required.
- 5. The organization of the manuscript should consist of the following parts: introduction, context and review of literature, method, result/findings, discussion, conclusion and recommendations.
- 6. Tables, figures and other illustrations should be kept to the barest minimum and are to be numbered consecutively.
- 7. The approved referencing styles is the current American Psychological Association (APA) format.
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# EDITORIAL OVERVIEW

It is with joy, excitement and sense of service that we bring to you the International Journal of Education and Ethical Issues in Research (IJEEIR), a peer-reviewed journal published by the Faculty of Education, University of Uyo, Uyo, Akwa Ibom State, Nigeria.

The Journal aim is to publish both in print and online versions, empirical and theoretical research papers that are of international significance in the field of education.

The Journal receives articles written by experts and practitioners in the field of education. Articles submitted are evaluated using the criteria of excellence, novelty and significance, thereby ensuring that only works of high quality that have relevance to contemporary issues and trends in education are put forward for international readership.

It is our Editorial Board policy that only manuscripts that follow the guidelines for Authors, as well as adherence to major ethical issues in conducting research are accepted and reviewed for publication.

Send us your treasured research articles to form part of the next edition that promises to be stimulating and analytic.

**Prof. Antiabong O. Ekong**, FNATT, MNAE Editor-in-Chief

# EFFICACY OF COGNITIVE BEHAVIOUR THERAPY IN MANAGING BULLYING BEHAVIOUR AMONG CHILDREN WITH PHYSICAL DISABILITIES IN PUBLIC SPECIAL SCHOOLS IN SAPELE LOCAL GOVERNMENT AREA, DELTA STATE.

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#### Abstract

The study investigated the efficacy of cognitive behavioural therapy in managing bullying behaviour among children with disabilities in public special school in Sapele Local Government Area, Delta State. This study adopted a pre-test-post-test control group quasiexperimental design. Three (3) hypotheses were formulated to guide the study. The target population consisted of 125 secondary school students 1-3 in special public secondary schools in Sapele Local Government Area, Delta State.Multi-stage random sampling technique was adopted and used to select 102 children with physical disabilities in public special secondary schools in Sapele Local Government Area, Delta State. The instrument that was used for data collection was researchers'-developed scale titled; Anti-Bullying among Special Student Questionnaire (ABASSQ). The scale comprises 20 items, structured on a four-point Likert format, with responses ranging from strongly agree to strongly disagree. The internal consistency of the instrument was determined by analyzing the data collected using Cronbach's Alpha statistic and an alpha value of 0.79 was obtained. The instrument was used to collect data for pretest scores for both experimental and control group which was followed by a six weeks treatment of the experimental group while the control group was not treated. At the end of the treatment session, both experimental and control group were post-tested using the same instrument and the questionnaire was retrieved immediately from the respondents. The data collected were analyzed using inferential statistics of paired sample t-test, Fisher's LSD Post hoc pairwise comparisons and one and two way Analysis of Variance (ANOVA). The findings of the study showed that cognitive behaviour therapy was significantly efficacious in managing bullying behaviour among children with physical disabilities. Based on the findings, it was recommended among others that, counsellors should utilize cognitive behaviour therapy in managing bullying behaviour among children with physical disabilities.

Keywords: Bullying, Disabilities, Cognitive Behaviour, Reality Therapy, Efficacy

# Introduction

School has always remained one of the safest places, next to the home in a child's life. One wonders if this still holds sway in our present society given the ever increasing negative behaviours in our schools. These negative behaviours contrast to the expectations of the society and are problematic to the individuals and those around them (Olweus, 2013). Behaviour is the way one acts or conducts oneself especially towards others. When certain behaviour conforms to the demands and acceptable standard of the society, it is said to be an adaptive or positive behaviour but if it does not, it is said to be maladaptive or negative behaviour. Such negative behaviours may include bullying. Bullying is a conduct disorder or behavioural problem that exists in most public special schools (Field, 2017). It is an unwanted aggressive behaviour among school aged children with physical disabilities. There is the tendency that children who are bullied and who bully others may have serious lasting problems. Bullying is the intentional, repetitive harming or injury by one's peer or peers; they are occurrences in which the victim is unable to avoid or stop the victimization, this behaviour has emerged as a persistent problem in many public special schools. It is an unwelcomed behaviour among school aged children particularly among secondary school students and it involves a real or perceived power imbalance.Bullying is abusive behaviour by one or more students against a victim or victims. It can be a direct attack, teasing, taunting, threatening, stalking, name-calling, hitting, making threats, coercion, and stealing; or more subtle through malicious gossiping, spreading rumours, and intentional exclusion. Both result in victims becoming socially rejected and isolated. (Alulede, 2011). Bullying in the schools therefore is a much more damaging and dangerous experience for children than ever suspected. Unfortunately, it is much more prevalent and is trending at an earlier age than ever before especially among children with physical disabilities. Bullying can lead teenagers to feel tense, anxious, and afraid. It can affect their concentration in school, and can lead them to avoid school in some cases. If bullying continues for some time, it can begin to affect their' self-esteem and feelings of self-worth. It also can increase their social isolation, leading them to become withdrawn and depressed, anxious and insecure. In extreme cases, bullying can be devastating for children, with long-term consequences. Some teens feel compelled to take drastic measures, such as carrying weapons for protection or seeking violent revenge. These have led to the formation of fighting groups/cults in the secondary schools. Others, in desperation, even consider suicide. Bullying whether verbal, physical or both is one way people claim a sort of power in their lives by seeking out those who seem vulnerable and attacking some aspect of their personality that makes them stand out.

The researchers have discovered from their experience as counsellors that, years after the bullying has stopped, adults who were bullied as teens have higher levels of depression and poorer self-esteem than other adults. Victims of bullies often fear school and consider it to be an unsafe and unhappy place. They will often stay home 'sick' rather than go to school or travel on the school bus. They experience real suffering that can interfere with their social and emotional development, as well as their school performance. Some have attempted suicide rather than continue to endure such harassment and abuse. Other victims have taken out their anger and frustration in violence. Most of the young people who have caused school-related violent deaths have been victims of bullying. Pepler and Craig, (2010) discovered that bullying and victimization occurs in all schools as well as special schools.

The phenomenon may seriously affect the development and adjustment of pupils and students with disabilities. There are several factors that could influence bullying behaviour among children with physical disabilities, but this study focused on sex.Some researchers believed that boys are more involved in bullying than girls, some say girls are more involved while others believed that both sexes equally engage in bullying but that the difference is in the type of bullying they engaged in.

According to the reports of Bullying Statistics (2010), 46% of male participants and 26% of female participants reported they had been in physical fights, while Olweus (2013), Field (2017), Badejo & Ubangha (2012) are in agreement that boys engage in more direct method of physical assault than the girls, who may likely engage in subtle indirect bullying methods such as calling names and spreading rumours. Egbochuku (2007) found out that bullies were most likely to be boys. Boys tend to engage in physical forms of bullying and sexual harassment more than the girls whereas the girls are more involved in verbal aggression (Farrington & David, 2015). When school bullying, harassment or emotional abuse is ignored or improperly managed, it can affect school settings such as losing classroom learning time; poor learning and academic performance; students who dislike school and are afraid to attend class increases in number; more health problems among students; a fearful and disrespectful environment; a perception that teachers and staff have little control or do not care, and so on. Consequently, there is need to manage bullying behaviour among children with physical disabilities. The researcher therefore makes use of Cognitive Behaviour therapy to manage bullying behaviour among children with physical disabilities in Sapele Local Government Area, Delta State.

Cognitive Behavioural Therapy (CBT) is a short-term goal-oriented psychotherapy treatment that involves an applied method to problem-solving. It aims to alter thought patterns that are behind individuals' difficulties, and so alter the way they feel. Cognitive Behavioural therapy was propounded by Beck in 2011. This treatment method is a hands-on method that requires both the therapist and the client to participate in the process. They both work together as a team to identify the problems of concern, come up with new plans for addressing them, and finding lasting solutions (Martin, 2016). CBT is based on the cognitive model of mental illness which states that individuals' behaviours are influenced by their perceptions of events. It is not the situation that regulates what individuals feel but rather their interpretation of the situation (Beck, 2004).CBT focuses on challenging and changing unhelpful cognitive distortions such as thoughts, beliefs, attitude, and behaviours, and improving emotional regulation, and developing personal coping strategies that target solving current problems. The goal of Cognitive Behavioural Therapy is to reduce individuals' anxiety by training them how to identify, evaluate, control, and change their negative thoughts and behaviours (Hawton & Kirk 2009). Cognitive Behavioural Therapy is based on the idea that a person's unrealistic thoughts, feelings, and beliefs lead to one's negative and unhealthy behaviours. Undergoing CBT helps the participants become aware of their unreasonable thoughts and beliefs so they can view their situation more realistically and react more healthily. Originally, the therapy was designed to manage depression, but its use has been expanded to include treatment of several mental health conditions, including bullying behaviour. This therapy has been found to be effective in enhancing adaptive behaviour (Egbochuku & Obadan, 2005) as well as managing maladaptive behaviours.

In a study carried out by Razieh, et al (2013) on effectiveness of cognitive-behavioural therapy in managing social anxiety reduction and bullying in female high school students in Karaj. The study used a semi-experimental design, a pre-test, post-test type with the control group and follow-up phase. The sample size comprised of 60 students, which were selected using multi-stage sampling technique. Social anxiety and bullying questionnaire was used which contains 48 items with four Likert format. Cognitive behavioural therapy was used to treat the participant for five weeks of eight sessions. Descriptive statistics of mean, and standard deviation and inferential statistic of Analysis of Covariance and t-test statistic were used to analyze the data. The findings showed that cognitive behavioural therapy was effective in the management of social anxiety and bullying of the students.

In another study carried out by Rien and Netherlands (2015) on the efficacy of Cognitive Behavioural Therapy in managing anxiety, a quasi-experimental research design was adopted for the study. Participants were psychiatric outpatients with a Diagnostic and Statistical Manual of Mental Disorders (4th ed.) diagnosis of generalized social phobia (GSP). A matching procedure was used to obtain two equivalent samples in both conditions (N 5 48). It was shown that CBT were effective in reducing social and general anxiety, decreasing the severity of psychopathology, and increasing social skills and self-control. The researchers therefore sets out to investigate the efficacy of Cognitive Behaviour Therapy in managing bullying behaviour among children with physical disabilities in Sapele Local Government Area, Delta State, Nigeria.

# **Purpose of the Study**

The study investigated the Cognitive Behaviour Therapy in managing bullying behaviour among children with physical disabilities in Sapele Local Government Area, Delta State. Specifically, the objectives are to:

- 1. find out the difference in the pre-test and post-test of bullying behaviour mean score of children with physical disabilities exposed to Cognitive Behaviour Therapy;
- 2. ascertain the difference in the pre-test and post-test of bullying behaviour mean score of children with physical disabilities exposed to Cognitive Behaviour Therapy and those in the control group;
- 3. determine the interaction effect of treatment by sex in managing bullying behaviour of children with physical disabilities.

# Hypotheses

- 1. There is no significant difference in the pre-test and post-test of bullying behaviour mean score of children with physical disabilities exposed to Cognitive Behaviour Therapy.
- 2. There is no significant difference in the pre-test and post-test of bullying behaviour mean score of children with physical disabilities exposed to Cognitive Behaviour Therapy and those in the control group.
- 3. There is no significant interaction effect of treatment by sex in managing bullying behaviour children with physical disabilities.

# Methodology

This study adopted a pre-test-post-test control group quasi-experimental design. Three (3) hypotheses were formulated to guide the study. The target population consisted of all one hundred and twenty-five (125) secondary school students 1-3 in special public secondary schools in Sapele Local Government Area, Delta State.Multi-stage random sampling technique was used to select 102 children with physical disabilities in public special secondary schools in Sapele Local Government Area, Delta State. In stage 1, simple random sampling was used to select two public special schools from Sapele LGA while in stage 2, purposive sampling technique was employed to select an intact class from each of the public special school selected in stage 1 and in stage 3, the intact class selected in school A became experimental group (54), while the intact class selected in school B became the control group (48) by simple random sampling.

The instrument that was used for data collection was a researchers'-developed scale titled; Anti-Bullying among Special Student Questionnaire (ABASSQ). The scale comprises twenty items, structured on a four-point Likert format. With responses ranging from strongly agree to strongly disagree. The purpose of the instrument was two-fold: first, to help determine students with high and low bullying behaviour scores in the intact classes; and to treat obtained scores as pretest scores for children with physical disabilities with high bullying behaviour scores and also use the instrument to obtain post treatment scores on the basis of which the effect of treatment was determined. The instrument was pilot-tested on some selected special students who were not part of the main study but were considered equivalent in nature. The internal consistency of the instrument was determined by analyzing the data collected using Cronbach's Alpha statistic and an alpha value of 0.79 was obtained. The instrument was used to collect data for pretest scores for both experimental and control group which was followed by a six weeks treatment of the experimental group while the control group was not treated. The first step in the treatment procedure was the pre-testing of participants in the experimental and control group. The second stage was the treatment of the experimental groups using cognitive behaviour therapy and reality therapy, while the control group will be the non-attention group. Stage three was the post-test assessment of the participants in the experimental and the control groups. At the end of the treatment session, both experimental and control group were post-tested using the same instrument and the questionnaires were retrieved immediately from the respondents. The data collected were analyzed using inferential statistics of paired sample t-test, Fisher's LSD Post hoc pairwise comparisons and one and two way Analysis of Variance (ANOVA).

# Results

**Hypothesis 1:** There is no significant difference in the pre-test and post-test of bullying behaviour mean score of children with physical disabilities exposed to Cognitive Behaviour Therapy.

Table 1: Paired sample t-test of pre-test and post-test of mean scores on management<br/>of bullying behaviour among children with physical disability exposed to<br/>CBT treatment.

Test	Ν	Mean	Standard	Т	Sig. (2-tailed
			Deviation		
Pre-test	54	137.40	31.35		
				7.521	.000
Post-test	54	99.87	17.82		
P ≤ .05					

Table 1 shows a paired sample t-value of 7.521 at an alpha level of 0.05, with a p-value of .000. Since the p-value is less than the alpha level of 0.05, the null hypothesis which states that there is no significant difference in the pre-test and post-test of bullying behaviour mean score of children with physical disabilities exposed to Cognitive Behaviour Therapy is rejected. Consequently, Cognitive Behaviour Therapy is significantly efficacious in the management of bullying behaviour among children with physical disability in Sapele Local Government Area, Delta State.

**Hypothesis 2:** There is no significant difference in the post-test of bullying behaviour mean score of children with physical disabilities exposed to Cognitive Behaviour Therapy and those in the Control group.

Treatment Group	Ν	Mean	Standard Deviation	Т	Sig. (2-tailed
Experimental	54	137.40	31.35		
				-8.077	.000
Control	48	125.93	19.50		
$\mathbf{D} \neq 05$					

Table 2: Paired sample t-test of bullying behaviour scores of participants exposed to<br/>CBT and those in the control group at paretest

P ≤ .05

Table 2 shows a calculated t value of -8.077 and a p-value of .000 at an alpha level of .05. Since the p-value is less than the alpha level, there is a significant difference in bullying behaviour mean scores of participants exposed to CBT and those in the control group at pretest. Hence the need to use pretest scores as covariate.

# Table 3:Mean and standard deviation in bullying mean post-test scores of<br/>participants exposed to CBT and those in the control group

Treatment Group	Ν	Mean	Standard Deviation
Experimental	54	103.75	19.095
Control	48	149.56	14.704

Table 3 shows the mean and standard deviation in bullying behaviour mean scores of participants exposed to CBT and those in the control group at post-test as 103.75 and 19.095 for the experimental group and 149.56 and 14.704 for the control group respectively.

Table 4:	ANCOVA of bullying behaviour post-test scores of participant exposed to
	CBT and those in the control group

Source	Type III SS	df	MS	F	Sig.
Corrected Model	42812.179 <sup>a</sup>	2	21406.089	564.875	.000
Intercept	1038.438	1	1038.438	27.403	.000
Pretest	15454.498	1	15454.498	407.821	.000
Group	11647.478	1	11647.47	307.260	.000
Error	8829.597	233	37.895		
Total	292219.000	236			
Corrected Total	51641.775	235			

a. R Squared =.829 (adjusted R Squared =.828),  $p \le .05$ 

Table 4 shows a calculated F value of 307.260 and a p-value of .000 at an alpha level of .05. Since the p-value is less than the alpha level, the null hypotheses which states that there is no significant difference in the post-test of bullying behaviour mean score of children with physical disabilities exposed to Cognitive Behaviour Therapy and those in the Control group is rejected. Consequently, there is a significant difference in post-test mean scores of participants exposed to CBT and those in the Control group. Hence, the need for a post-hoc analysis.

# Table 5:LSD post-hoc pairwise comparison in bullying behaviour mean post-test<br/>scores of participant exposed to CBT and those in the control group.

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig. <sup>a</sup>
Experimental	Control	-45.806*	.862	.000
Control	Experimental	45.806*	.862	.000

\*. The mean difference is significant at the .05 level.

a. Least Significant Difference (equivalent to no adjustments).

Table 5 shows a mean difference of -45.806 and a p-value .000. Since the mean difference is negative it shows that CBT is more efficacious in managing bullying behaviour compared to the control group. Hence the results obtained from Tables 2, 3 and 4 above showed that the hypothesis which states that there is no significant difference in the post-test of bullying behaviour mean score of children with physical disabilities exposed to Cognitive Behaviour Therapy and those in the control group is rejected.

**Hypothesis 3:** There is no significant interaction effect of treatment by sex in managing bullying behaviour children with physical disabilities.

# Table 6: Mean and standard deviation of treatment by sex interaction effect on<br/>bullying behaviour among children with physical disabilities exposed to CBT<br/>and those in the control group at Post-test

Group	Sex	Ν	Mean	Std. Deviation
Experimental	Male	24	21.40	3.07
	Female	30	21.10	2.23
	Total	54	21.25	2.68
Control	Male	28	43.81	13.06
	Female	20	41.64	15.45
	Total	48	42.79	14.21
Total	Male	52	32.79	14.73
	Female	50	31.01	14.93
	Total	102	31.93	14.82

Table 6 shows the mean and standard deviation in bullying behaviour mean scores of male and female students exposed to CBT and those in the control group at post-test as 21.40 and 3.07 for male; 21.10 and 2.23 for female in the experimental group and 43.81 and 13.06 for male; 41.64 and 15.45 for female in the control group respectively.

exposed to CBT and those in the control group					
Source	Type III SS	df	MS	F	Sig.
Corrected Model	42990.139a	4	10747.535	286.961	.000
Intercept	955.280	1	955.280	25.506	.000
Pretest	15492.558	1	15492.558	413.654	.000
Group	11471.358	1	11471.358	306.287	.000
Sex	27.652	1	27.652	.738	.391
Group *Sex	149.613	1	149.613	3.895	.035
Error	8651.636	231	37.453		
Total	292219.000	236			
Corrected Total	51641.775	235			

# Table 7: Two-way ANCOVA of bullying behaviour post-test scores of students

a. R Squared = .832 (Adjusted R Squared = .830)

Table 7 shows a calculated F value of 3.895 and a *p* value .035 at an alpha level of .05. Since the p-value is greater than the alpha level, the null hypotheses which states that there is no significant interaction effect of treatment by sex in managing bullying behaviour is retained. This means Cognitive behaviour therapy managed bullying behaviour of males and females equally well.

# **Discussion of the Findings**

The first hypotheses which states that there is no significant difference in the pre-test and post-test of bullying behaviour mean score of children with physical disabilities exposed to Cognitive Behaviour Therapy was rejected. Meaning that CBT was efficacious in managing bullying behaviour among children with physical disabilities exposed to CBT treatment. This finding agrees with the findings of the study that was carried out by Razieh, et al (2013) where they found that CBT was efficacious in managing maladaptive behaviour.

The second hypothesis which predicted that there would be no significant difference between the experimental and control group was rejected based on the results. The difference between the treatment group and the control group is as a result of counselling (six weeks of treatment with CBT), that has taken place. This finding finds congruence with Rien and Netherlands (2015) who found out that CBT could manage negative behaviour such as bullying behaviour.

The third hypotheses which states that there is no significant interaction effect of treatment by sex in managing bullying behaviour f children with physical disabilities was retained. This means that CBT managed both the bullying behaviour of males and females children with physical disabilities. This result agrees with the study of Egbochuku (2008), who found no significant difference between the proportion of boys and girls who have experienced some form of bullying. This is however in contrast with the study of Badejo and Ubangha (2012) who found out sex differences in managing bullying behaviour in their study. However, the differences in the studies enumerated can be as a result of cultural differences and the effective contribution of the treatment.

# Conclusion

Based on the findings of this study, it concluded that Cognitive Behaviour Therapy was efficacious in managing bullying behaviour among children with physical disabilities and that bullying behaviour is not influenced by sex; it can be deduced that bullying behaviour among children with physical disabilities may be due to the lack of exposure to psychotherapy such as CBT, as opposed to socio-demographic variables of Sex.Intervention was efficacious in managing bullying among children with physical disabilities. This was significant from their pre-test and post-test mean scores.

# Recommendations

- 1. Functional counselling units should be established in all public special secondary school and counsellors should be employed to treat children with physical disabilities with CBT psychotherapy as this will be of benefits to them than giving them mere advice.
- 2. Children with physical disabilities in public special school should take advantage of the treatment package of CBT as this will help them manage bullying behaviour
- 3. Researchers should take advantage of the data used in this study to serve as a reference for further research work to promote educational gains, as well as manage bullying behaviour among children with physical disabilities.

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## MODERN TRENDS IN RABBIT PRODUCTION FOR NATIONAL DEVELOPMENT AND FOOD SECURITY IN NIGERIA

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## Abstract

This paper considered the challenges and modern trends in rabbit production for national development and food security in Nigeria. Rabbit production faces a lot of challenges in Nigeria, and such challenges include: poor housing, healthcare challenges, and poor quality of foundation stock and marketing. This review presents economic importance and nutritional value of rabbits as well as modern trends in breeding and artificial insemination, in new technologies, housing structures, feeding and feeding equipment, as well as general management and awareness. It is however recommended among others that government on its part should sponsor her agricultural personnel to acquire modern skills, technique and technology for profitable rabbit enterprise and on their part, farmers should adopt these new techniques and technology to blend with the traditional method for increase in rabbit production and food security for national development in Nigeria.

Keywords: Modern Trends, Rabbit Production, National Development, Food Security

# Introduction

Nigeria is still characterized by high reliance on food importation. Malnutrition is widespread in the entire country and the rural areas are especially vulnerable to chronic food shortage, malnutrition, unbalanced nutrition, erratic food supply, poor quality food, high food cost and even near total lack of food. This phenomenon makes food security Primus-inter-Pare of the country priorities. Food security according to United State Agency for International Development (USAID), (2016) means that all people at all times have physical, social and economic access to sufficient, safe and nutritious food that meets their food preference and dietary needs for an active and healthy life. A family is food secured when her members do

not live in hunger or fear of hunger. Food insecurity is often rooted in poverty and has longterm impact on the ability of families', communities and countries to develop and prosper. Prolonged under nourishment, results in stunted growth, slow cognitive development and increased susceptibility to illness.

There is a high level of malnutrition among children in rural areas of Nigeria; with 56% reported in rural areas of the South and 84.3% in the northern part of Nigeria (Akinyele, 2009). The key thrust of Nigeria's agricultural renaissance is to diversify its economy by making agriculture the hub of economic growth while also achieving a hunger-free country. A hunger-free country is one that is food secure. Food security has become a national priority for the Nigeria considering that about 198.1 million of her population is food insecure (Federal Ministry of Agriculture and Rural Development, 2016). Food and nutrition insecurity is prevalent in Nigeria despite its favorable agro-ecological endowments. Nigeria has a total landmass of 92.4 million hectares, out of which only about 32 million hectares or 34.63 percent are under cultivation. Nigeria, therefore, lacks both the capacity and capability to cater for the food and nutrition requirements of its teeming population. As such, food insecurity and the prevalence of under-nutrition in Nigeria are among the worst globally (Fadare, Amare, Mavrotas, Akerele & Ogunniyi, 2019).

Although Nigeria is yet to devote 10 percent of its annual national budget to agriculture to be on track to achieving 6 percent growth in productivity as projected in the Comprehensive Africa Agricultural Development Program (CAADP) and the ECOWAS Agricultural Policy (ECOWAP) documents, it initiated major agricultural policies from 2010 and has been pursuing them (FMARD, 2016). Also, although modest progress has been made in the production of cassava and rice, there are still enormous gaps between domestic production and demand for many staple crops. Thus, Nigeria expends huge amount of its scarce resources on food importation. Nigeria's Central Bank sources indicated that the country's monthly import bill in 2015 was US\$665.4 million. However, new data from the same source showed that the figure had drastically fallen to US\$160.4 million monthly by October 2018 (CBN, 2018).

Notwithstanding these snippets of success, the overall picture is that Nigeria is grossly food and nutrition insecure with the lurking danger that it could slip into acute food insecurity without warning due to the erosion of agricultural productivity by national insecurity. In Nigeria, several attempts have been made to address food and nutrition insecurity through such programmes like the National Accelerated Food Production Programme (NAFPP), Operation Feed the Nation (OFN), Green Revolution and the Directorate of Food, Roads and Rural Infrastructure (DFRRI), among others. In spite of the enormous prospects for National development in agriculture and food security in Nigeria, these intervention programmes have recorded little or no success considering the current rate of hunger, malnutrition, poverty and poor rural livelihood (Smith, 2018).

Rabbit (*Oryctolagus cuniculus*) which is described as a micro livestock species (Viet-Meyer, 1985), appears to be the cheapest and sustainable means of producing high-quality animal protein for expanding population of developing countries like Nigeria. Onifade, Abu, Obiyan & Abanikannda (1999) opined that pre-urban rabbit production can contribute to meet the growing demand for fresh and affordable animal product in conurbation of development. Also rabbit production may provide the impoverished urban population and the resource-poor rural dwellers the opportunity to earn additional income on a sustainable basis.

The possibilities derived from the exceptional attribute of rabbit includes: affordable or lowcost management requirements, small body size, short gestation interval, fecundity, rapid growth rate, genetic diversity, ability to utilize forage and agricultural by-products and adaptation over a wide range of ecological environment. Nutritionally it is high in protein, low in sodium, low in fat and cholesterol. With the enormous benefits of rabbit production, the national growth and food security of the country will be achieved by increasing meat (protein) production and gross domestic production (GDP) of the country as well as employment opportunity. Indulgence of farmers in the production of rabbit will help reduce food insecurity in meat production, serve as a means of exportation to other countries and increase the availability of fresh meat protein in the country.

# Economic Importance of Rabbit Production to Food Security and National Development

Rabbit possesses a number of features that might be of advantage in the smallholder subsistence type of farming in Nigeria.

- Rabbit farming or production is a rewarding business with high probability of recouping i. original investment within the shortest possible time (Oseni, Ajayi, Komolafe, Siyanbola, Ishola & Madamidola. 2008). It is also a veritable way of alleviating animal protein deficiency in Nigeria (Onyeonoro, 2016). A rabbit has immense potentials and good attribute which include high growth rates, high efficiency in converting forage to meat, short gestation and high prolificacy, relatively low cost of production, high nutritional quality of rabbit meat which includes low fat, sodium and cholesterol levels high protein level of about 20.8% while its consumption is bereft of culture, ethnic and religious bias (Lukefahr, 2010). The presence of caeca-microbe enables rabbit to digest large amount of fibrous feed that most non-ruminant species cannot. Rabbit grow fast especially if fed well, reaching sexual maturity at five months and slaughter weight at 3 months they require less land space with diminishing land size, meaning it can be reared at the backyard. Rabbit can derive their feed requirement entirely on forages only. They are prolific with each doe capable of reproducing four times a year with an average of 8 kittens per kindling. In addition to these rabbits have one of the highest feed conversion ratios of 4:1 (Iheukwumere, 2018).
- In recent years there has been increased awareness of the advantage of rabbit meat ii. production in Nigeria as a means of alleviating food insecurity. This is due to the rabbits' high rate of reproduction, early maturity, small body size and rapid growth rate only comparable to that of broiler chickens (Baruwa, 2014). High genetic selection potential, efficient feed and land space utilization, limited competition with humans for similar food and high-quality nutritious meat makes rabbit an outstanding specie for food security. (Arijeniwa, Otaikhan & Imaseun. 2000). Rabbit has been identified as an economic livestock that could breach the wide gap in dietary protein intake in Nigeria (Adedeji, Adejumo & Obaniyi. 2012). It is a micro livestock producing about 47 kg of meat per day per year which is enough to solely meet the annual protein requirements for a modern medium sized family (Ugosor, Ochu & Agbulu. 2016). Besides, rabbit meat is rich in vitamin B and extremely low in cholesterol and sodium. The meat of the rabbit is white, fine-grained, and nutritious, the meat is more nutritious than that of poultry chickens. Rabbit skin or pelt are of economic importance as it could be used in producing carpets and other decorative household ornamentals and its dung serves

as manure for soil improvement. As a result of a number of characteristics that are advantageous to rabbit production the venture is of great significance to improve food security and nutrition in Nigeria which can as well reduce to some extent, the country's malnutrition problems and the diminishing bush meat supply across the country.

#### **Challenges Militating Against the Production of Rabbit in Nigeria**

The constraints which limited the production of rabbit in Nigeria include the following;

- i. **Poor Housing:** Rabbits are not fully accorded proper housing thus resulting in poor animal performance especially during the wet season. This constitutes a major constraint in the adoption of improved rabbit technology by producers (Ozor & Madukwe, 2005). Similar observation was made by (Oseni et al., 2008). In West Nigeria, further studies by (Muldrin, 2010) noted the prevalence of premature death of fryers as well as weaners due to this challenge. This is complicated by the fact that most extension agents were not adequately equipped to impart knowledge and skills to rabbit producers on disease and pest of rabbits. Furthermore, there is low level of awareness on the benefits and prospects of the enterprise and economic value in Nigeria thereby, resulting in low number of farmers going into rabbit production enterprise.
- ii. **Health Challenges:** Lukefahr, Nkwocha, Njakoh, Tawah, Akob, Kongyu,Njwe, and Gudahl (2000), reported one of the health challenges in rabbit production in Nigeria, to be one of the difficulty of rabbit producers to procure drugs for treatment of rabbit due to low purchasing power. Others are inability to promptly isolate sick animals and difficulty to access to veterinarian services.
- iii. **Marketing:** Marketing has also been a major issue in rabbit production as there is no established state-wide market or marketing system for rabbits. In most cases producers develop their own market. However, they appear to be good domestic demand for rabbit meat because of its taste and that it could be presented as bush meat which is highly prized.
- iv. **Poor Quality of Foundation Stock:** There are no known rabbit breeders in the country to ensure quality foundation stock and this hinders the growth of this industry. Oseni et al (2008) and Kaplan-pasternak (2011) found out the challenges facing rabbit production to be difficulty in getting reliable and stable source for foundation or replacement stock. Iwena (2015) observed that a major problem militating against commercial production of rabbit in Nigeria is unpredictable breeding behavior of rabbits. Others were: incidence of respiratory disease, inadequate sanitation and sanitation programs, high nest box mortality of litters, lack of ability to embark on mass production because most production activity in rabbit cannot be automatized, he added that inadequate supply and high cost of concentrate feed impedes large investment in the industry.
- v. Lack of Awareness: One of the major constraints of rabbit production in Nigeria includes awareness of rabbit meat consumption. According to Gu, Chen, Huang, Liu, Chen, and Zhao, (2014), the Chinese supported the need for the promotion of rabbit meat to increase the awareness of rabbit production. The rabbit branch of the Chinese animal husbandry association has sets every 6th of June as "rabbit meat festival" during which various activities are conducted. This positively impacts on the acceptance of rabbit meat and the popularization of the knowledge about rabbit meat.

# **Modern Trends in Global Rabbit Production**

Global rabbit production is currently estimated at more than 1 million tons per year. According to FAO, (2019) the world largest producer of rabbits for food security is China with 315,000 tons and followed by Italy with 221,000 tons, Spain with 135,000 tons, France with 85,000 tons, Malta with 1,350 tons, and Cyprus with 830 tons. In 2000 Europe produced 570,051 tons of rabbit, South America produce 16317 tons and Central America 4364 tons. In North America very little rabbit is consumed, production was estimated at just 35,000 tons, and Africa produced 85,782 tons (76,600 tons came from North Africa).North African countries produce 90% of Africa's rabbit meat covering 15% of European consumption (570,051 tons). Morocco tops production at 0.78 kg per person. There are some commercial rabbit farmers and most rabbit farming in North Africa are essentially artisanal. From data collected it was discovered that rabbit production in Nigeria is largely a traditional and not fully commercial with an average of 2 to 7 doe's and 3 bucks per stock making Nigeria far back in exploiting the international market demand of rabbit meat to high demanding countries like China, Italy, Japan and United States which has high demand of these white meat and increase the meat production demand of the country (FAO, 2001).

**Trending Issues on Rabbit Management**: Modern issues trending in global rabbit production include:

- i. **Housing:** The conventional method of housing rabbit in Nigeria include cage rearing on wooden poles and placing one cage on top of the other which hinder proper ventilation, high constitution of ammonia builds up, high rates of disease circulation in between hutch boxes, easy attack by rodents and other predators. The modern housing makes provision for hutch boxes hanging from the ceiling roof. Where cages are erected on wooden poles, there are provision for nest warmer, aluminum photo flood reflector, insulation foam board panels, plastic foam trays or 25-watt bulb to keep the cage warm at about 18 to 28 degrees Celsius and each of any of the above instrument serve same purpose depending on the commercial size of the production or farmers purchasing power. The improvement in the housing construction of rabbit helps in reducing ammonia build up, communicable disease, reduce mortality rate due to provision of warming apparatus in the hutch box during extreme cold period as is peculiar to cold States in Nigeria like as Plateau.
- ii. **Feeding:** Rabbits are mono-gastric herbivores and can only thrive on forage which is a cheap source of feed and but for optimal biological gains there are needs to supplement with concentrates. Feeding of rabbit constitutes about 70% of the total management functions, therefore feed provided for the rabbit should be provided in modern fed trough and racks. France developed modern feed hoppers for green or pellets and small trough for feed mashes as well as modern rack for forage. According to Mayip (2015), in large commercial production, the Egyptians provided concentrates in the morning while forage was served in the evening. Although, feeding in rabbit is cheap there is a tendency for rabbit to contaminate, waste and soil forage that is being served which will lead to total rejection and loss of feed by the producer. Modern technology in France was developed to avoid spillage and wastage of feed and water by rabbits. The bars of the rack were designed to withstand rabbit teeth and keep the young ones from entering to soil the forage. The feed hopper was also designed to trap and keep young ones out.

The width between partitions in the feeding box is about 7 to 8 cm for medium breeds and the racks closely-spaced (1-2 cm) to prevent wastage. For watering, use of old cans or glass or earthenware pots as drinkers can create a hygiene problem. One possible improvement is an invented water bottle drinker or better still though expensive, is an automatic drinker in every cage. The automatic open drinker ensures that rabbits always have clean water and can also be easily used in administering medicine.

- iii. **General Equipment and Management:** Equipment designed to improve rabbit production in advance countries include humane traps or havahart, this new equipment help to return or retrieve escaped rabbits.
- Artificial Insemination: Kitajima (2009), submitted that the novel technique for iv. efficient colony management and production of rabbit include artificial insemination. The authors submitted that the technique shows better performance other than natural mating. Recent result has shown that one ejaculation can be sufficient to fertilize about 25 females. This innovation can help in reduction of resistance to bucks, pseudo pregnancy in doe's and several hazards faced during natural breeding in rabbit. In recent years, in order for China to encourage and increase the production of rabbit and its industry in the country, it decided to formally incorporate the rabbit production into China Agricultural research system and started long-term support to promote the development of rabbit industry (Wu, 2007). In management, the recent trend is the achievement of the development of the "bande unique" in commercial rabbitries. Here, where all doe's are inseminated the same day, 30-31 days after, all the pregnant doe's kindle together, all litters are weaned on the same day and all rabbits leaves the rabbitry on the same day for the slaughterhouse or market. This management method would enhance mass production of rabbits all over the country

# Conclusion

Traditional rabbit production can be improved to meet the needs of the modern society. Rabbit production has been in its micro stage of exposure in Nigeria, though the world had gone beyond micro production of rabbits. Nigeria has been slacking in the full commercialization of rabbitry due to lots of reasons which include inadequate awareness of the enterprise, inadequate technologies or modern techniques and technology in rabbit production, poor quality foundation stock (good breeds), etc. This paper viewed the recent developments and trends in rabbit production and to how it can improve food security in Nigeria. Individual bodies, companies or government organizations can improve rabbit production into commercialization to alleviate poverty, educate and increase food security in the country. The paper looked into novel developments in the areas of housing, feeding and general management of rabbits to ensure high production of rabbit meat for the country and also for exportation to high demand countries like China and Italy. It should be highly noted that if the new trends and technologies are fully inculcated by individuals, companies and government organization in Nigeria, there would be a significant increase in the production, awareness of the prolific nutritional value of rabbit meat and rabbit production.

# Suggestions

In the light of the foregoing and conclusion drawn from the paper, the following suggestions are made that:

- 1. Government at all levels should through the Ministry of Agriculture allocate trainees to acquire recent ideas, skills, techniques and technologies on rabbit production and management for onward transmission to rabbit farmers
- 2. State and Federal Government through the Ministry of Information and Agriculture Development Programmes should introduce programs to develop and create awareness, profitability, production and nutritional value of rabbits to widen acceptability and increase production for national development and food security.
- 3. Rabbit Farmers should adopt new trends in the construction of housing and feeding, general management and artificial insemination in rabbit production.

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## ETHICAL ISSUES AND PROFESSIONAL PRACTICE OF SECONDARY SCHOOL COUNSELLORS IN AKWA IBOM STATE

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#### Abstract

The study was conducted to determine the extent of compliance of secondary school counsellors to ethical issues in Akwa Ibom State. The population consisted of 165 practicing counsellors from public secondary schools in Akwa Ibom State. The purposive sampling technique was adopted for the study as all the practicing counsellors in the state public secondary schools were involved in the study. A structured instrument tagged "Ethical Issues and Professional Counselling in public Secondary schools Questionnaire" (EIPCQ) was developed and used for data collection. The instrument was made up of two parts. Part I solicited personal information from the respondents, while part II, made up of two sections A and B, solicited responses to the variables of the study. Altogether there were twelve items on the instruments, which was validated using face and content validity and tested for reliability using the Cronbach Alpha reliability technique. This gave a reliability coefficient of .82. With this, the instrument was considered significant, hence appropriate for the study. The researcher administered the questionnaire with the aid of a research assistant. The respondents were visited in their respective schools, served the questionnaire and encouraged to fill and return them. Independent t-test was used in testing the two null hypotheses at .05 level of significance. On the basis of the data analysis, it is concluded that secondary school counsellors in Akwa Ibom State are competent and legible for the job as they are selected based on qualification and certification. Besides, the counsellors uphold to the ethics of their profession and ensure that no harm is done to clients, the school and the society at large. It was recommended among other things that the State Secondary Education Board should ensure continuous mandatory training for all school counsellors in the state. This is intended to keep the counsellors abreast of the global trend in contemporary school counselling.

# **Keywords:** Ethical Issues, Counselling, Secondary School Counsellors, Professional Practice

#### Introduction

There is no way of avoiding ethics in counselling, but the question is whether the counsellor will be ethical in the practice of the profession. The importance of knowing the contents of professional codes of conduct and the purposes and limitations of such codes is essential to the understanding of ethical and legal issues in school counselling. School counsellors should

therefore have at least a basic understanding of their ethical responsibilities as defined in these documents. The ethical standards of practicing counsellors present school counsellors with the behaviors to which they should comply and give general guidelines for addressing difficult issues in the school system. They do not, necessarily provide answers to the many specific dilemmas that school counsellors face. However, when the standards do not provide enough direction, counsellors are encouraged to consult with colleagues, professional experts, and perhaps their administrative supervisors before taking action. Almost all professionals, at some point in their career, suspect or become aware of a colleague's unethical behavior. School counsellors are obligated to address any conduct by a colleague that could cause harm to clients. This informs the need for a good understanding of the ethics of the profession and the need for school counsellors to uphold to them. This paper investigated two important ethical considerations in school counselling and the level of compliance of secondary school counsellors in Akwa Ibom State.

# **Ethical Issues and Counselling Practice**

Cohen, Manion, and Morrison (2007) identified three different levels of ethical regulation in research: legislative, professional and personal. At the legislative level, a school counsellor may require ethical approval from which can often be seen as a hurdle to get over as opposed to an opportunity for ethically sound decision-making. This process is also referred to as 'procedural ethics'. Professional bodies and associations have formulated codes of practice that reflect the values of the professional group and provide guidelines for ethically sound practice within a specific discipline. Some of the professional bodies' codes of practice pertinent to education, psychology and guidance counselling are: Counselling Association of Nigeria (CASSON); British Educational Research Association (BERA): British Psychological Society (PSI); Irish Association for Counselling and Psychotherapy (IACP); International Association of Educational and Vocational Guidance (IAEVG); and Institute of Guidance Counsellors (IGC, 2012). Practitioners who are members of such bodies are bound to their specific codes of practice and need to refer to these while practicing. The codes can also serve as reference points when specific issues arise in the research process such as duty of care, levels of confidentiality guaranteed and the sharing of data.

However, even though there is a certain degree of homogeneity between these professional codes and guidelines, they can only provide a guide and cannot tell the practitioner what to do in unique situations (Cohen et al., 2011). Haas and Malouf (2009, p.11) argued, in particular, that ethics are 'situated' and arise from "the practicality of conducting research, the need for sensitivity to socio-political contexts and to be fair to disadvantaged groups, and to take account of the diversity and uniqueness of different situations". However, continuous ethical reflexivity and keen discernment in decision-making is required to deal with specific issues and situations as they arise (Hearne, 2009).

The four key ethical principles outlined in most counselling *Code of Ethics* are respect for the rights and dignity of the client; competence; responsibility; and integrity. Embedded within these four are three specific items related to school counselling:

- (i) When engaging in counselling, protect the dignity and wellbeing of clients.
- (ii) Take all reasonable steps to ensure that every collaborator treats clients in an ethical manner.
- (iii) Conduct counselling sessions in a way that is consistent with a commitment to honest, open inquiry, and communicate clearly any personal values or financial interests that may affect the programme (IGC, 2012, p. 32).

These professional principles align with the five ethical principles of counselling proposed by McLeod (2010). The principles are Non-maleficence, Beneficence, Autonomy, Fidelity, and Justice. Non-maleficence refers to the concept of 'doing no harm' and minimising the risk of psychological, emotional, professional and personal damage (Cohen et al., 2011). This is also known as the 'costs/benefits ratio' dilemma which is defined as the balancing of likely social benefits accrued from counselling practices against the personal costs to the individuals taking part (Cohen et al., 2011). Thomas (2009, p. 52) identified five potential risks:

- (i) Causing psychological or physical harm to clients or others;
- (ii) Damaging the standing or reputation of clients or others;
- (iii) Infringing on the privacy of clients or others;
- (iv) Breaking the law;
- (v) Harming a community in some way.

School counsellors need to make decisions about the counselling process in accordance with their personal values and professional ethics. In particular, consideration has to be given to the possible impact on the client during and after counsellor sessions regardless of the age and background of the client. A particular ethical issue in guidance counselling is the protection of the client's privacy at all times. McLeod (2003) argued that "informants who feel safe are more likely to share more of themselves" and proposes the three specific strategies of appropriate counselling practices, informed consent and maintaining confidentiality to minimise harm to clients. It is paramount that appropriate referral routes and supports are identified in advance in the event that clients become upset during the interactions. It is an ethical responsibility at the core of our professional practice to ensure that those individuals we engage with are not exploited, damaged or abandoned in the pursuit of new knowledge.

Beneficence is inextricably linked with non-maleficence and refers to the idea that counselling should also strive to contribute to the health and wellbeing of individuals and society (McLeod, 2010). Counselling needs to be worthwhile and valuable. *Autonomy* refers to the clients' freedom of action and freedom of choice to counselling without coercion (McLeod, 2010). The school counsellor needs to respect the "right of individuals to discontinue participation in counselling services at any time, and be responsive to non-verbal indications of a desire to discontinue if individuals have difficulty in verbally communicating such a desire" (NCGE, 2008). The issue of autonomy is addressed through the procedure of informed consent.

Fidelity in counselling practice denotes the confidential and respectful nature of counselling and the need for "loyalty, reliability, dependability and action in good faith" (McLeod, 2010). The purpose and counselling procedure should be communicated honestly and accurately, in a straightforward and open manner, and non-exploitative in terms of any conflict of interest in the professional and personal relationships involved (NCGE, 2008). The fifth principle, justice, implies that school counsellors need to be mindful of the social justice aspect of their activities and give due recognition to the role of counselling in the interests of the oppressed, marginalised or minority groups (McLeod, 2010).

# Competence

There are two general approaches to describe ethical issues in the counselling profession: principle ethics and virtue ethics. Principle ethics refer to rules and guidelines related to

specific problem situations, whereas virtue ethics refer to ideal characteristics or qualities of professionals (Meara, Schmidt & Day, 2006). Counsellor competence is an important ethical issue for both the development of the profession and the well-being of clients and one of the primary ethical guidelines of many professional organizations (Kim, 2002). As Corey, Corey, and Callanan (2007) noted, counsellor competence lies at the center of protecting the client from potential harm and promoting the client's welfare. Counsellor competence is related to the principle ethics of nonmaleficence, which states that professionals should not harm others intentionally (APA, 1995). Meara et al. (2006) suggested that clients may be harmed if counsellors are not knowledgeable and skilled in counselling, and that the more clients are culturally different from their counsellors, the possibility of harm increases.

Counsellors are expected to strive to improve their competence in counselling knowledge, practice, and other related activities. Also, counsellors need to recognize and practice within the limits of their professional competence. Competence is one of the ethical standards in APA's Ethical Principles of Psychologists and Code of Conduct (APA, 2003). Psychologists strive to maintain high standards of competence in their work. They need to recognize the boundaries and limitations of their expertise, and provide services or use techniques that they are qualified by education, training, or supervised experience. The ACA's (1995) *Code of Ethics and Standards of Practice* includes professional competence under section C "Professional Responsibility," where counsellors are asked to practice only within the boundaries of their competence, based on their education, training, supervised experience, credentials, and professional experiences. These ethical guidelines explicitly indicate that they are qualified through appropriate education, training, or experiences.

In contrast to principle ethics, virtue ethics provide ideal characteristics or qualities of professionals. Meara et al. (2006) suggested that the virtue of prudence is required for psychologists to maintain competence. A prudent person is described as someone who is "planful, appropriately cautious, who has foresight, and who has or exercises good judgment" (p. 38). In other words, a prudent person knows what is morally good, has the ability to judge ethical situations, applies ethical principles and rules, and acts upon one's decision. In view of the above, counsellor competence is considered important from both the perspectives of principle ethics and virtue ethics. Principle ethics provide general guidelines about counsellors' competent practice, while virtue ethics provide characteristics of a prudent professional who has the ability to judge what is morally good and act upon one's own judgment.

Competence can be defined either by analyzing a competent counsellor's characteristics or analyzing the components of competence. Haas and Malouf (2009) defined a competent counsellor as a person who possesses required knowledge, necessary skills, and fine judgment to use such knowledge and skills. Competent counsellors use knowledge to understand and conceptualize clinical issues, use skills to apply knowledge in effective ways, and use judgment to determine when to apply knowledge and skills. Lee and Sturkie (2007) suggested a broader definition by including an awareness of standards of practice and professional ethics as a component of a competent professional, in addition to the competence in understanding and applying the essential facts and theories in the counselling profession, and the ability to assess clinical judgment. The competency-based training model (Fantuzzo, 1984, cited in Sumerall, Lopez, & Oehlert, 2000) is another approach in defining counsellor competence. Fantuzzo reduced counsellor competence into basic components and suggested that competence can be acquired by mastering each component. These components included mastering prerequisite body of knowledge, assessing implementation of skills, setting minimal standards to guide academic training and to evaluate skill level, yielding to continuing education programme, and delineating relevant legal and ethical principles to enforce compliance. Fantuzzo's model assures that competence can be acquired through learning knowledge, defining skills to be effective in a specific area, and practicing and assessing those skills until specified standards can be achieved.

Both approaches indicated that counsellor competence includes three components: knowledge in a given area, skills that are needed to transform knowledge into practice, and sound judgment. Ethics is one of the areas in which counsellors need to have knowledge, skills, and sound judgment, and to apply them accordingly. Thus, counsellor competence is one of the requisites for ethical practice, while being ethical is a requisite for being a competent counsellor.

In order to address ethical issues in professional practice, school counsellors can deal with professional dilemmas by viewing ethics as an active process of discretionary decision-making, deliberative judgement and professional reflexivity (Hearne, 2011). As observed by Meara, Schmidt and Day (2006), in spite of reference to ethical guidelines, ethical principles and codes of practice, ethical decision-making is predicated on one's own value system and involves a high degree of intuitive thinking.

# Confidentiality

The basic human need of a right to privacy can be violated during the course of counselling, or afterwards, making the client "extremely vulnerable" (Cohen et al., 2011). Cohen et al. (2011) stressed that privacy is much more than confidentiality as it pertains to the right of the client not to take part in any or all of the counselling sessions. Therefore, the onus is on the school counsellor to inform clients of their right to refuse, as well as obtain permission to take part. Mertens (2010) provides clear definitions for two terms central to the protection of clients' anonymity and confidentiality. *Anonymity* means that no uniquely identifying information is attached to the data and thus no one, not even the researcher, can trace the data back to the individual providing them. *Confidentiality* means that the privacy of individuals will be protected and that the data they provide will be handled and reported in such a way that they cannot be associated with them personally (Mertens, 2010, p.342).

Preserving anonymity by not using the names or any other personal information about participants' ensures confidentiality of their identities. The most common way of achieving this is the use of pseudonyms and codes for identifying people and password-protected files. Whilst anonymity can be easier to guarantee in questionnaire design (Thomas, 2009), this cannot be expected in face-to-face interviews (Cohen et al., 2011). Cohen et al. (2011:91) argued that at best the researcher can "promise confidentiality".

The ethics of respect for client autonomy stresses the importance of collaboration and negotiation with the client in decisions about confidentiality (Kidd, 2006; NCGE, 2008). It is standard practice to inform clients of how information will be stored and destroyed (McLeod, 2010). It is also important to inform them about the limitations of confidentiality, especially
in ethically sensitive areas where confidentiality cannot be automatically guaranteed. As Cohen et al. (2011:92) asserted, "the more sensitive, intimate or discrediting the information, the greater the obligation on the researcher's part to make sure that guarantees of confidentiality are carried out in spirit and letter. Promises must be kept".

Confidentiality and privileged communication are two related issues that school counsellors should not be confused. Information clients relate to school counsellors should be kept confidential with the following general exceptions: (a) the client is a danger to self or others; (b) the client or parent requests that information be related to a third party; or, (c) a court orders a counsellor to disclose information. Although all school counsellors have a confidentiality responsibility, very few relationships with students are considered privileged. Privileged communication is granted only by statute and guarantees clients that a court cannot compel a counsellor to disclose information related in confidence. Such statutory privileges belong to clients rather than to counsellors, and most states do not grant privileged communication in school counselling relationships. On the basis of the above, this study was undertaken to determine the extent of compliance of secondary school counsellors to ethical issues in Akwa Ibom State.

#### **Purpose of the Study**

The study was carried out to:

- 1. Determine the level of competence of secondary school counsellors in Akwa Ibom State.
- 2. Determine the level of compliance of secondary school counsellors to ethical standard in Akwa Ibom State.

### **Research Questions**

- 1. What is the level of competence of secondary school counsellors in Akwa Ibom State?
- 2. What is the level of compliance of secondary school counsellors to ethical standard in Akwa Ibom State?

### Hypotheses

- 1. There is no significant difference in the mean responses of male and female secondary school counsellors on the level of competence of school counsellors in Akwa Ibom State.
- 2. There is no significant difference in the mean responses of male and female secondary school counsellors on the level of compliance to ethical standard by school counsellors in Akwa Ibom State.

### Methodology

The population for the study stood at 165 practicing counsellors from public secondary schools in Akwa Ibom State for the 2019/2020 school session (State Secondary Education Board, 2020). No sampling was done in for the study as all the practicing counsellors in the state public secondary schools were involved in the study. A structured instrument tagged "Ethical Issues and Professional Counselling in public Secondary Schools Questionnaire" (EIPCQ) was developed by the researcher and used for data collection. The instrument was made up of two parts. Part I solicited personal information from the respondents, while

part II, made up of two sections A and B solicited responses of the variables of the study. There were twelve items on the instruments. The research instrument was validated using face validity. The instrument was tested for reliability using the Cronbach Alpha reliability technique. This gave a reliability coefficient of 0.82. With this, the instrument was considered reliable and hence, appropriate for the study. The researcher administered the questionnaire with the aid of a research assistant. The respondents were visited in their respective schools, served the questionnaire and encouraged to fill and return them. Descriptive statistics (Mean and Standard Deviation) was used in answering the research questions, while t-test analysis was used in to test all the null hypotheses at 0.05 level of significance.

#### Results

**Research Question 1:** What is the level of competence of secondary school counsellors in Akwa Ibom State?

# Table 1:Weighted mean of the level of competence of secondary school counsellors<br/>in Akwa Ibom State

S/N	Level of competence of school counsellors	Me		
		Male	Female	Cluster
		Counsellors	Counsellors	Means
	Secondary School counsellors in Akwa Ibom State:			
1.	Are graduates of guidance and counselling	2.6	2.8	2.7
2.	Are certified school counsellors	2.9	3.1	3.0
3.	Have a mastery of the prerequisite body of knowledge in guidance and counselling	3.3	3.4	3.35
4.	Possess the necessary skills in school counselling	2.7	3.1	2.9
5.	Possess the minimum standard of academic training for the practice of guidance and counselling	2.7	2.6	2.65
6.	Have a good knowledge of ethical issues in guidance and counselling	2.9	2.9	2.9
Avera	ge Means	2.85	2.98	2.92

Cut off point = 2.5

Table 1 presents the mean scores of level of competence of male and female secondary school counsellors in Akwa Ibom State. Both the individual item mean scores and the cluster means of the two groups of counsellors (male and female) are above the cutoff point of 2.5, indicating a high level of competence of the counsellors.

**Hypothesis 1:** There is no significant difference in the mean responses of male and female secondary school counsellors on the level of competence of school counsellors in Akwa Ibom State.

Independent t-test analysis was employed in testing the hypotheses.

# Table 2:Weighted mean and t-test of the responses of male and female school<br/>counsellors on the level of competence of school counsellors

S/N	Level of competence of school	Me	ans	t-value	Remarks
	counsellors	Male Counsellors	Female Counsellors		
	Secondary School counsellors in Akwa Ibom State:				
1.	Are graduates of guidance and counselling	2.6	2.8	1.21	NS
2.	Are certified school counsellors	2.9	3.1	1.52	NS
3.	Have a mastery of the prerequisite body of knowledge in guidance and counselling	3.3	3.4	1.66	NS
4.	Possess the necessary skills in school counselling	2.7	3.1	1.01	NS
5.	Possess the minimum standard of academic training for the practice of guidance and counselling	2.7	2.6	1.44	NS
6.	Have a good knowledge of ethical issues in guidance and counselling	2.9	2.9	1.11	NS

 $N_1 = 96$ ;  $N_2 = 69$ ; df = 163; t-cri = 1.96; Average t-cal = 1.33;

S = Significant; NS = Not Significant

Table 2 indicates no significant difference in the mean responses of male and female secondary school counsellors on the level of competence of school counsellors in Akwa Ibom State. On the whole, the average t-value of 1.33 is less than the critical t-value of 1.96, leading to the retention of the null hypothesis. This implies a high level of competence of practicing school counsellors in secondary schools in Akwa Ibom State. This is further portrayed in the magnitude of the mean scores which are higher than the cut-off point of 2.5 in both groups.

**Research Question 2:** What is the level of compliance of secondary school counsellors to ethical standard in Akwa Ibom State?

## Table 3:Weighted means of the level of compliance to ethical standard by<br/>secondary school counsellors in Akwa Ibom State

S/N Level of compliance to ethical standard –		Me	ans	
		Male Counsellors	Female Counsellors	Cluster Means
1.	I secure the consent of my client before any counselling session.	2.8	2.9	2.85
2.	I give adequate information to my clients on the purpose of every counselling session.	3.1	3.2	3.15
3.	I keep confidential every information or data made available to me by my clients.	3.2	3.4	3.3
4.	I am always mindful of the social justice of every counselling activities I undertake.	2.8	2.9	2.85
5.	I minimize the risk of psychological, emotional, professional, and personal damage to my clients.	2.9	3.0	2.95
6.	I ensure that every counselling session contributes to the health and wellbeing of my clients and society.	3.1	3.3	3.2
Aver	age Means	2.98	3.12	3.05

Cut off point = 2.5

Table 3 presents the mean scores of the level of compliance to ethical standards by male and female secondary school counsellors in Akwa Ibom State. Both the individual item mean scores and the cluster means of the two groups of counsellors (male and female) are above the cutoff point of 2.5, indicating a high level of compliance by the counsellors.

**Hypothesis 2:** There is no significant difference in the mean responses of male and female secondary school counsellors on the level of compliance to ethical standard by school counsellors in Akwa Ibom State.

# Table 4:Weighted means and t-test of the responses of male and female secondary<br/>school counsellors on the level of compliance to ethical standard by school<br/>counsellors

S/N	Level of compliance to ethical	Me	ans	t-value	Remarks
	standard	Male Counsellors	Female Counsellors		
1.	I secure the consent of my client before any counselling session.	2.6	2.8	1.21	NS
2.	I give adequate information to my clients on the purpose of every counselling session.	2.9	3.1	1.52	NS
3.	I keep confidential every information or data made available to me by my clients.	3.3	3.4	1.01	NS
4.	I am always mindful of the social justice of every counselling activities I undertake.	2.7	3.1	1.04	NS
5.	I minimize the risk of psychological, emotional, professional, and personal damage to my clients.	2.7	2.6	1.06	NS
6.	I ensure that every counselling session contributes to the health and wellbeing of my clients and society.	2.9	2.9	1.11	NS

 $N_1 = 96$ ;  $N_2 = 69$ ; df = 163; t-cri = 1.96; Average t-cal = 1.16;

S = Significant; NS = Not Significant

Table 4 indicates no significant difference in the mean responses of male and female secondary school counsellors on the level of compliance to ethical standard by school counsellors in the state. On the whole, the average t-value of 1.16 is less than the critical t-value of 1.96, leading to the retention of the null hypothesis. This implies compliance to ethical standard by male and female school counsellors in secondary schools in Akwa Ibom State. This is further portrayed in the magnitude of the mean scores which are higher than the cut-off point of 2.5 in both groups.

#### **Discussion of Findings**

Finding in research question 1 indicates a high level of competence by secondary school counsellors in Akwa Ibom State. The mean scores of the identified items and cluster mean score were higher than the cut off mean indicating a high level of competence. Data analysis in hypothesis one equally revealed a high level of competence by secondary school counsellors in Akwa Ibom State. The average t-value of all the items was less than critical

t-value indicating no significant difference in the responses of the male and female secondary school counsellors in the state. Both groups of counsellors agreed to a high level of competence as indicated by the magnitude of the means scores. In all the secondary schools in Akwa Ibom State, counsellors are appointed based on their training and certification as counsellors. This negates the chances of a not qualified counsellor being recruited and posted to any of the schools. As observed by Kim (2002), counsellor competence is an important ethical issue for both the development of the profession and the well-being of clients. Counsellor competence lies at the center of protecting the client from potential harm and promoting the client's welfare (Corey, Corey, and Callanan, 2007). Counsellor competence is related to the principle ethics of nonmaleficence, which states that professionals should not harm others intentionally. Clients may be harmed if counsellors are not knowledgeable and skilled in counselling, and that the more clients are culturally different from their counsellors, the possibility of harm increases (Meara, Schmidt, & Day, 2006).

Finding in research question 2 portrays a high level of compliance to ethical standard by secondary school counsellors in Akwa Ibom State. The mean scores of the identified items and cluster mean score were higher than the cut off mean indicating a high level of compliance. Data analysis in hypothesis two indicated no significant difference in the mean responses of male and female secondary school counsellors on the level of compliance to ethical standard by school counsellors in Akwa Ibom State. The average t-value of all the items was less than the critical t-value, retaining the null hypothesis. Both groups of counsellors agreed to a high level of compliance to ethical standard as indicated by the magnitude of the means scores. By implication, secondary school counsellors in the state ensure a high level of compliance to the ethical standard of the counselling profession in the performance of their duties. Confidentiality and privileged communication are two related issues that school counsellors must ensure at all times as professionals in the counselling profession (Cohen et al., 2011). The ethic of respect for client autonomy stresses the importance of collaboration and negotiation with the client in decisions about confidentiality. It is a standard practice to inform clients of how information will be stored and destroyed (McLeod, 2010). This will settle every doubt and issues of confidentiality and anonymity that may arise during the counselling session.

### Conclusion

On the basis of the data analysis, it is concluded that secondary school counsellors in Akwa Ibom State are competent and legible for the job as they are selected based on qualification and certification. Besides, the counsellors uphold to the ethics of their profession and ensure that no harm is done to clients, the school and the society at large.

### Recommendations

On the basis of the conclusions reached, the following recommendations were made.

- 1. The State Secondary Education Board should ensure continuous mandatory training for all school counsellors in the state. This is intended to keep the counsellors abreast of the global trend in contemporary school counselling. While at the same time, school authorities should ensure that counsellors are provided with conducive offices and required materials to enhance effective performance of their duties.
- 2. Counselling Association of Nigeria should ensure the mandatory attendance of all school counsellors at meetings, while sanctioning counsellors that stay away from such meetings without genuine reasons.

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#### TEACHERS' UTILIZATION OF INSTRUCTIONAL ACCOMMODATIONS IN TEACHING LEARNERS WITH DYSGRAPHIA IN CROSS RIVER AND AKWA IBOM STATES

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#### Abstract

This research focused on teachers' utilization of instructional accommodations in teaching learners with dysgraphia in Cross River and Akwa-Ibom State, Nigeria. It adopted mixed research approach and Ex-post facto design, with 119 teachers, head teachers and principals purposively sampled from six special schools, three from each state in the study area. Two hypotheses were formulated to guide the study. Two instruments, 60 item questionnaire with five points response scale tagged Questionnaire on Teachers' Utilization of Instructional Accommodations (QTUIA), Questionnaire for Evaluation of Teachers' Comptence on Instructional Accommodations for Learners with Dysgraphia (QETCIALD) and interview guide with 10 open ended questions were developed by the researchers, validated by relevant experts and used to collect data from the field. The reliability coefficient of the questionnaires determined through Cronbach Alpha method were 0.79 and 0.88. Pilot study was conducted to further validate the instruments and the design. Chi-Square test was used to analyze the data while content analysis was used to analyze responses from interview to complement quantitative analysis, recorded views of respondents were quoted verbatim and italicized where necessary to substantiate result from quantitative analysis. The findings revealed that teaching experience and participation in conferences/workshops have no significant influence on teachers' ability to use instructional accommodations in teaching learners with dysgraphia. Based on this result, it was recommended among others that school management should de-emphasize seniority criteria and conference/workshop attendance as basis for allocation of teaching responsibilities as it concern this category of learners.

Keywords: Instruction, Accommodations, Dysgraphia, Teachers and Learners

#### Background of the Study

Exceptionality is a two sided coin, on one side are those who are positively exceptional (the gifted and talented), and on the other side are the negatively exceptional ones (children and adults with disabilities). Among this category, there are those with a disability called dysgraphia or handwriting disability; a sub type of an umbrella special needs conditions called learning disabilities or specific learning disorders (Lerner & Kline, 2006; APA, 2013; Bartonova, 2014). Interestingly, learners with this disabilities have equal right to quality education and other services as provided by discrimination against persons with disabilities (prohibition) Act, 2019 and other relevant legislation. The implication of this is that stakeholders, especially teachers as vanguard of curriculum implementation should stop at nothing in bringing their experiences and certified knowledge to bear in providing quality education for all irrespective of ability or disability in inclusive classroom and this begins with proper understanding of the concept of dysgraphia and it implications on teaching and learning.

Several efforts at conceptualizing this disability have been made, typical among them is the American Psychiatric Association (APA) that defines it as impairment in written expression that manifest in a discrepancy in the written product or sample between the age, education and level of intelligence of the individual. It further emphasized that symptoms such as lack of clarity of ideas, poor paragraphing, multiple grammatical errors among others must be expressed persistently for at least six months despite evidence based intervention on the disability (APA, 2013). Chung, Patel and Nizam (2020), sees dysgraphia as a disorder of writing ability at any stage, including problems with letter formation, legibility, letter spacing, and spelling, and fine motor coordination, rate of writing, grammar, and composition. It occurs when existing brain pathways are disrupted by events not limited to brain injury, neurologic disease, or degenerative conditions resulting in the loss of previously acquired skills. The term can also be understood as an impairment of written expression that encompasses any difficulty an individual may have in written communication despite sufficient learning opportunity and cognitive potentials. In the medical profession, the term dysgraphia is used to refer to this disability while in special needs education, it is known as either hand writing disability or written language disorder. The term dysgraphia is seemingly common in the literature because of it origin and the influence of research from medical professions/professionals on the disability. As a disability, it has academic and psychological effects on the dysgraphic. Unfortunately; it is misconceived and not given the desired attention. When there is comorbidity, other disabilities are remediated at the expense of dygraphia and the problem remains (Bender, 2004). Stakeholders' attention are drawn to the negative implications of this to promptly restructure school curriculum to include handwriting instruction where relevant skills in addition to handwriting supplement programmes in different sites are accessed. This will lead to the development of automaticity as skill needed for handwriting. With this, learners' handwriting will improve through the elementary school years with implications for long-term outcomes and associated benefits such as capacity to producing quality written products in school and non- school settings.

There are different theories and perspectives to understanding the chemistry of dsygraphia. Studies have shown that this disability can better be understood by looking at major etiological factors as depicted by motor-visual perceptual theory and contributive factors like non inclusion of handwriting in school curriculum, lack of qualified and adequate teachers to teach the skill, psychology of learners, absence of validated assessment process, methodology, misconception about the disability, among others. Principally, the spatial characteristics of written sample and ergonometric factors affect the holistic product thereby rendering it illegible or unreadable. The value of quality and good handwriting in different setting cannot be undermined even in the highly technology influenced era.

According to Dohla and Heim (2016), ability to write is a fundamental component of literacy, and is crucial for success not only in school but also in most workplace environments. Unfortunately, a significant proportion of children suffer from dysgraphia - that is, impairment in acquisition of writing skills. It is recently estimated that 7-15% of school-age children exhibit some form of development writing deficit. In the school environment where teaching and learning takes place most of the daily activities are written. This is further restated by Hoorn, Maathuis and Hadders-Algra (2013), that 30-60% of activities in school require children to write in one form of class activity or assessment practices such as assignment. Privately and personally, one needs to make a shopping list, write and pass note in a meeting to someone, write down personal information in a diary, take down briefs in a meeting and write down telephone messages, all these require well developed writing skills which are directly and proportionately responsible for legible handwriting. While it is relatively easy for learners or individuals without this disability to produce readable sample, dysgraphics find it unduly difficult and laborious to perform any written task. Considering the importance of this skill in daily life, school related activities and the reality of the disorder, they are most often frustrated half way in the process of performing any written task or tend to avoid it totally. When learners continuously avoid opportunity to develop the skill it leads to what is called skill arrest.

There is a worrisome trend and problem in the field of specific learning disorders (SLD) which is the lop-sided attention in favour of dyslexia both in research and teaching at the expense of dygraphia and dyscalculia. The ratio of this (research, teaching and remediation) is put at 3:1. While high prevalence of dyslexia is presented as argument to support this trend, it should be understood that both skills are critical to success in school and life generally. More so, it should be realized that there are opportunities for comorbidity of these conditions, thus therapy in only one way out but efforts to address these disorders should be holistic.

International policies and conventions on human rights equalized access to education. Consequently, every Nigerian classroom has learners with the disability (Obani, 2006). The implication of this is that stakeholders particularly teachers should brace up to challenges of this disability and its effect on learners in schools. This has become necessary because by the provisions of policies and legislation, they are required to actively participate and benefit from every instructional activity inclusive of written task such as writing examination, test, copying notes and other task that involves written expression. Learners with dysgraphia find it very difficult to cope with such written tasks. In order to provide level plain learning environment with equal opportunity to demonstrate what they have learnt, the level of mastery in all instructional activities in the school should comply with and make provision for accommodations as entrenched in the convention of Rights of Persons with Disabilities. Teachers should be trained to integrate accommodations in instruction and assessment in their pedagogical practices for inclusive teaching, with particular focus on learners who are dysgraphic (Kamala & Ramganesh, 2013).

Accommodations are instructional practices, procedures and devices that provide equitable access during instruction and assessment of students who have documented evidence of disabilities. The use of accommodation ensures that every learner with disability in the school has a fair and equal opportunity to learn by receiving standard instruction and demonstrate mastery (Colorado Department of Education, 2015). Accommodations are changes that can be made in the way teachers present instruction and how students with disabilities accesses information and demonstrates performance. This has become sacrosanct in special needs education practice as a measure of inclusion and compliance to principle of universal design for learning. However, accommodations must be used by teachers appropriately as it is not meant to reduce the value or acceptable standards, rather to reduce the effect of disability (dysgraphia) on the child's learning process. This reflect professionalism and compliance to global best practices in use of accommodations either in instruction or assessment (Ajuwon, 2012; VESID, 2006). Accommodations are generally in four categories, namely, presentation, response, time schedule and setting. However, each disability, child's needs, task among other factors are considered by the school and the IEP team as determinant of choice and utilization. This is in addition to existence of enabling policy and legislation to avoid unnecessary abuse and litigation. For instance, needs assessment of learners with dysgraphia must be done by relevant professionals with parental consent to recommend accommodations like technology devices (recording tools, Personal computers, tablet, phones, digital pen etc). Human scribe, extra time, preferred seat/setting and others are frequently used by teachers in Nigeria. In whatever circumstances related to use of instructional accommodations with students with disabilities, the standard framework has been set, which represent the student needs and disability profile, the prevailing or available environment where the student learns, task(s) to be performed and the tools required for successful completion of the given task (Yngve, Lidstorm, Eksladh & Hemmingsson, 2019). Based on the desire to achieve the purpose of accommodations and its appropriate use, this research was designed to examine the influence of teachers' variables such as teachers' teaching experience, and participation in conferences/workshops on utilization of accommodations in teaching children dysgraphia.

#### Statement of Problem

The right to access quality education has more implications on learners with handwriting disability than other stakeholders in the teaching-learning process, because every school day or activity is a source of worry and frustration to them. They know what to write but how to write what they know is more difficulty. This poses both psychological and academic problem to them as teachers and parents hardly compliment their written sample irrespective of number of attempts made. Their teachers' comment is always for them to rewrite and they are tired of laborious effort to write what peers do with ease. Right from spatial features to the 3Ps of hand writing, they are awkward. This make their samples or products illegible; and become even worse in assessment activity like examination due to tension and fear of how to write what is known and mastered. Instructional accommodations as integral part of teachers' pedagogy is meant to reduce the effect of the disability that is under threat by teachers' related variables, policy and legislative issues. All these present a picture of ineptitude and success in the sky in most areas of endeavor, particularly school based success.

### Hypotheses

The following null hypotheses guided the study.

- 1. There is no significant difference between the responses of teachers with greater and lesser teaching experience in the appreciation of the concept of instructional accommodations and its application in education of learners with dysgraphia.
- 2. There is no significant difference between the responses of teachers with higher and lower participation in conferences/workshops in special education in the utilization of instructional accommodations in teaching learners with dysgraphia.

### Methodology

The study adopted mixed research method and Ex-post facto design was used. 119 participants purposively sampled from 169 teachers, principals and head teachers in six special schools within the states. 111 teachers responded to the questionnaire and eight principals and head teachers took part in the interview. Two hypotheses were formulated to guide the study. Two instruments, 60 item questionnaire with five points response scale tagged "Questionnaire on teachers utilization of instructional accommodations" (QTUIA), Ouestionnaire for Evaluation of Teachers' Competence on Instructional and Accommodations for Learners with Dysgraphia (QETCIALD) and guided interview with open ended questions developed by the researchers and validated by relevant experts was used to collect data from the field. There were 10 open-ended questions, five focused on teaching experiences and the other five was on teachers attendance in conferences/workshops and utilization of instructional accommodations in schools. The reliability coefficients of the questionnaires determined through Cronbach Alpha method were 0.79 and 0.88. Responses from interview were recorded and additional notes were taken by co-authors. Chi-Square test was used to analyzed quantitative data while content analysis was used to analyzed responses from interview to complement result from quantitative analysis. Views of respondents were quoted verbatim where necessary to substantiate the results.

### Result

The results of this study are presented in tables below.

**Hypothesis 1:** There is no significant difference between the responses of teachers with greater and lesser teaching experience in the appreciation of the concept of instructional accommodations and its application in education of learners with dysgraphia.

	observed frequencies					expected frequencies			
	0-5 year	6-10 year	11+ years	Total		0-5 year	6-10 year	11+ years	Total
Agree & Strongly Agree	19	12	32	63	Agree & Strongly Agree	18,61	15,75	28,64	63,00
Disagree & Strongly Disagree	7	10	8	25	Disagree & Strongly Disagree	7,39	6,25	11,36	25,00
Total	26	22	40	88	Total	26,00	22,00	40,00	88,00
	Chi-Square Valu	ues							
	0-5 year	6-10 year	11+ years	Total	alfa	Chi2	4,562		
Agree & Strongly Agree	0,01	0,89	0,40	1,30	0,05	Chi2-krit	5,991		
Disagree & Strongly Disagree	0,02	2,25	1,00	3,27	0,01	Chi2-krit	9,210		
Total	0,03	3,14	1,39	4,562	0,001	Chi2-krit	13,816		

#### Table 1: Contingency table of teachers' teaching experience

The result of the analysis in Table 1 shows that the  $x^2$  statistic is 4.562, which is less than critical value of 5.991 at .05 level of significance with 2 degrees of freedom. The result is not significant since the critical value is greater than the calculated value. With this result, the null hypothesis which states that there is no significant difference between the responses of teachers with greater and lesser teaching experience in the appreciation of the concept of instructional accommodations and its application in the education of learners with dysgraphia is accepted. This implies that teachers' teaching experience does not in any way determine their ability to appreciate the concept of instructional accommodations and its application accommodations and its application in the education of learners with dysgraphia.



Figure 1: Bar chart showing teachers' responses to teaching experience

Descriptively, the responses of participants as shown in figure 1 above, 73.1% of teachers with 0-5, 54.5% with 6-10, 80% within 11 and above years teaching experience agreed that teaching experience do not determine the use of instructional accommodations while 26.9% with 0-5, 45.5%, 20% of them disagreed. This is evidence in responses of those who have taught for many years and those who are fairly and newly employed. This also supports the chi square test analysis as shown earlier.

Participants	Variables/theme	Pattern of	Interpretation of
		responses	responses
1, 3, 6 & 8	Teaching experience and use of instructional accommodations	Negative responses	Negative responses means that teaching experience has no influence on ability of teachers to use instructional accommodations.
2 &7	As above	Neutral responses	Neutral responses means that the participants do not have any opinion on the subject matter.
4 &5	As above	Positive responses	Positive responses implies that teaching experience help teachers to use instructional accommodations.

### Table 2:Content analysis of interview responses on teaching experience and use of<br/>instructional accommodations.

Table 2 indicates the response of participants on interview questions that focus on teaching experiences and teachers' ability to use instructional accommodations in teaching learners with dysgraphia. The break down shows that four interviewees responses are negative, two each are neutral and positive. The questions ranges from their opinions on whether experience influence ability to use new pedagogical trends like accommodations to teach learners with dysgraphia to benefits of teaching experience on instructional delivery for dysgrahics in school. Negative responses means that general teaching experiences has no significant influence on their competency to utilize instructional accommodations; neutral implies that they have no opinion about variables studied and positive means teaching experience can influence ability to use instructional accommodations in educating the target learners.

**Hypothesis 2:** There is no significant difference between the responses of teachers with higher and lesser participation at the conferences/workshops in special education and use of instructional accommodations that are based on learner's needs.

#### Table 3: Contingency table of teachers' participation in conferences/workshops

	a harmonic di Successi								-	
	observed freque	encies	expected frequencies					S		
	Agree & Strongly Agree	undecided	Disagree & Strongly Disagree	Total			Agree & Strongly Agree	undecided	Disagree & Strongly Disagree	Total
0 - 5 participation	26	6	13	45		0 - 5 participation	23,11	8,11	13,78	45,00
6 and more participation	31	14	21	66		6 and more participation	33,89	11,89	20,22	66,00
Total	57	20	34	111		Total	57,00	20,00	34,00	111,00
	Chi-Square Valu	les								
	0-5 year	6-10 year	11+ years	Total		alfa	Chi2	1,605		
0 - 5 participation	0,36	0,55	0,04	0,95		0,05	Chi2-krit	5,991		
6 and more participation	0,25	0,37	0,03	0,65		<mark>0</mark> ,01	Chi2-krit	9,210		
Total	0,61	0,92	0,07	1,605		0,001	Chi2-krit	13,816		

In Table 3 above, analysis indicates  $x^2$  value of 1.605 and the critical value of 5.991 at 0.05 level of significance with 2 degree of freedoom. The calculated  $x^2$  is less than the critical value which implies that there is no singincant difference between techers with higher and lesser number of attendance and participation in conferences/worshops in special education, the null hypothesis is therefore accepted.



Figure 2: Teachers responses to participation in conferences/workshops

In 2 figure above, teachers responses are grouped in three categories based on frequency of participation, 0-5 (57.78%),6-15 (44.64%),16 and above (60%) agreed that participation in conferences/workshops has no vital role in their ability to use instructional accommodations in education of dysgrahics in schools in the study area, 0-5 (13.33%), 6-15 (23.21%) and 16

and above (10.00%) are undecided while 0-5(28.89%) 6-15 (32.14%) 16 and above (30%) disagreed; based on this, the chi-square analysis result shown above is substantiated.

# Table 4:Content analysis of interview response on conference/workshop<br/>attendance and teachers ability to use instructional accommodations

Participants	Variables/theme	Pattern of	Interpretation of
		responses	responses
1, 3, 5,6, & 8	Conference/workshop and use of instructional accommodations	Negative responses	These responses indicate that conferences/workshops has no influence on ability to use the strategy.
4	As above	Neutral response	Means no opinion about the variables studied.
2&7	As above	Positive responses	This means that the variables (conference/workshop attendance) has influence on the use of instructional accommodations.

Table 4 represents responses of interviewees on influence of attendance of conferences/workshops on teachers' ability to use instructional accommodations in instructional provision for learners with dysgraphia. It shows that five of the participants' views were positive, one was neutral and two were positive. The result means that, five of them agreed that conference/workshops has no significant influence on the use of instructional accommodations, one had no opinion while two consider conference/workshop not relevant to teachers' ability to use instructional accommodations.

#### **Discussion of Findings**

The result of the analysis on the hypothesis one shows that teachers' teaching experience and the appreciation as well as its application in the education of learners with dysgraphia does not have significant influence on teachers' utilization of instructional accommodations in teaching the focused learners. The reason(s) is that old teachers with more teaching experiences graduated before curriculum for teachers training in most collages and faculties of education were expanded to include contemporary themes in special needs education. In addition to this, the influence of technology in education including special needs education require digital knowledge which older teachers lack.

This result is contrary to widely held opinions and result of previous studies, particularly Klni and Pdolsky (2016), Ewetan and Ewetan (2015) whose studies explored and validated the influence of teaching experience in the use of instructional accommodations. In the same direction, Swedish National Agency for Education (2017) reports how the use of accommodations in upper secondary schools is independent of the variable under study.

However, the findings of this present study has being corroborated by Ladd (2008) who opined that seniority of teachers as measured by teaching experience has no instructional value to the teaching-learning process in most educational systems because teachers get bored with the routines in the profession and form business cliques which negatively affect their productivity especially if they primary clients are those with special needs that requires patience, commitment and dedication. Also, the finding of this study is affirmed by Wamakote (2010), who in his study found that teaching experience and application of new pedagogical trends or strategies such as instructional accommodations are not primary correlates. This is particularly true about the use instructional accommodations as most of them in the 21<sup>st</sup> century are technology driven teachers with higher teaching experience are not posit to using technology in the classroom like the younger teachers who find technology based accommodations best tools to facilitate teaching-learning process for learners with special needs, including those with dysgraphia in the school system. Findings of Homayoon, Damirchi and Almasi (2021) validate this and reported that experiences are valuable asset successful teachers have but knowledge and capacity to use emerging technologies as accommodations for written tasks is not determine by numbers of years on the job. Further implication of the present study is that emerging trend in the education of learners with handwriting disability and modern classroom have shifted from the assumption that experience is the best teacher. This is particularly true as fresh graduates with sound knowledge of technology and rich experience in use accommodations can be more impactful however, they still need guidance of senior colleagues on ethical and professional issues. This also implies that teaching learners with this disability require more than mere general teaching experiences. Learners with this on their part prefer the use of technology based instructional accommodations because it reduces the level of their frustration on any written task and the effect of the disability on the learning process. A contemporary Nigerian classroom and teacher who hold fast to traditional instructional principle where teaching experience is the king is not inclusive and dynamic in his/her pedagogical practice. Those with dysgraphia will be excluded from instructional process and their right to quality education denied.

The result from the content analysis of interview with principals and head teachers on this subject matter is in line with result from quantitative findings of this study as most of them confirmed that teaching experience is important but not related to the use of accommodations for dysgrahics in Nigerian classroom. They further hold that, Education and economic system in the country do not provide for their adequate needs of teachers. The older you are in the profession, the less productive you become because you will be pre occupied with the life after retirement with less attention to professional responsibilities. 'Well, let me confidently tell you that I am now concern about my post service life because government does not promptly pay teachers entitlement so instead of focusing and bringing my experience to bear in new instructional trend or practice like accommodations for learners, I assigned them the *younger teachers*'. The opinions of most interviewees particularly principals across the schools reflect the above quoted and italicized statement. However, principals and head teachers in Faith-based schools seem to differ marginally in their opinions. The marginal differences in the opinions of principals and head teachers of Faith-Based schools is implicitly expression of their religious perspective to the provision of services to learners with special needs (dysgraphia) and the school not to government. On what is the common practice of seniority in the school, principals views are that they support the policy as stated by government with the consent of parents before any accommodation is introduced to the child. Parents prefer teachers with more experience to teach their children with the special

needs condition. Two head teachers interviewed said, "we do assigned experienced teacher to work with any learner who is qualified for accommodations but it was observed newly employed teachers with do better."

Respondents' views and opinion on teachers' experience and competence on instructional accommodations indicate that only few of them have understanding of some aspects like the categories of accommodations but do not know how to involve students in the selection. It was a common view among head teachers/principals that general teaching experience dose not enhance the use of accommodations. From these responses, some were indifferent while others hold that experiences can improve ability to use instructional accommodations. However, they specifically mentioned that it is experience on accommodations for children with special needs condition not general teaching experience. Based on the result from quantitative analysis of the hypothesis and the content analysis of interviewees in the samples schools, it obvious that the widely held position that experience is the best teacher does not apply to teachers' appreciation of instructional accommodations and its application in education of learners with dysgraphia in Cross River and Akwa-Ibom state, Nigeria.

The second hypothesis focuses on the influence of teachers' participation in conferences/workshops in relation to their ability to use instructional accommodations that are based on needs of learners with dysgraphia. From this study, findings indicate that participation in conferences/ workshops have no significant role to play in teachers' ability to use instructional accommodations in education of dysgraphics in the study area. Possible reason(s) for this result is the politics of selection of who should attend a particular conference especially when it sponsored. More so, some of them are not active participant as such they gain little or nothing from the conference. Most importantly, teachers' conditions of service in Nigeria do not motivate them to put in their best especially when they think about their post service life and expectations This result means that although participation in conferences/workshops in special education is important, however, it does not play any vital role in teachers' ability in using instructional accommodations that are based on needs of learners with dysgraphia in Cross River and Akwa-Ibom state, Nigeria. Ideally, workshops are potent tools for training and building of human capacity to improve skills for efficiency in service delivery and conferences offer opportunity to share research findings on current pedagogical issues in special needs education primarily to improve professional practices, and provide solutions to problems in teaching-learning process.

The findings are not in agreement with most of the empirical research reviewed, particularly it is not supported by Hill (2012) and NAEC (2015). Hill's study concluded that participation in conferences/workshops helps teachers to maximize their knowledge beyond the scope of textbooks in content areas which may have become outdated in view of dynamism that characterized special needs education practice. This implies that it does but not in the area of using of instructional accommodation with dysgraphics. In the same way NAEC, Nigeria based professional association evaluates her activities in conferences/workshops for the past 15 years and found that it coordinates the use of instructional practices like accommodations. Also, Cross River state Ministry of Education (2012), Robinson (2013) and Fareo (2013) in different researches on the subject matters found that teachers' use of reasonable accommodations to some extent is linked to their participation in conferences/workshops. Unlike the above, findings of the present study is affirmed by Ihenacho (2006) whose study found that participation in conferences/workshops in special education in Nigeria has no much value for teachers in primary and secondary schools. Even when national workshops

are organized, most of them are uninterested. Thus, there is no direct correlation between conference/ workshop participation and ability to use instructional strategy like accommodations. However, he opined that themes on utilization of instructional accommodations are sometimes sub-themes in conferences and focus of workshops organized by professional associations. Also, Orim (2015) found that, although research findings presented in conferences can form topics for training in workshops for teachers, it is not likely that those without previous knowledge can apply accommodations strategies for special needs persons, as each has unique needs that requires particular expertise. An insight into the findings of this study reveals that attending conferences/workshops does not correlate teachers' ability to use accommodations because of many factors which include but not limited to, primary motives of organizers, the organization, content of the workshop materials and very importantly quality of resources persons used. When such programmes are driven by personal motives of self-enrichment, ideal benefits and objectives will not be achieved. This is what happens most times when Universal Basic Education Commission and State Universal Basic Education Board organized workshops for teachers. In some instances, less attention is paid to dysgraphia as special need condition. This account for high percentage of participants who agreed that conferences/ workshops does not influence the variable studied. This means that if goals of educational policies like Sustainable Development Goals (SDGs), National Policy on Inclusion Education (NPIE), Universal Basic Education (UBE), National Policy on Special Needs Education (NPSNE), etc are to be achieved, stakeholders should explore opportunities beyond conferences /workshops to build capacity of teachers to enhance their role in successful implementation of these policies for learners with handwriting disability in schools.

Responses from head teachers and principals indicate that schools have no specific influence on teachers' ability to teach learners with dysgraphia who may needs accommodation on written tasks. Concerning policy on participation in conference/ workshop, when we are invited, we get approval from supervisory ministry or agency to attend, this depends on the cost implications on approval authority. On number of conferences/workshops, principals attends more that the head teachers. More so, it depend on the personal engagements and the time of the event. They reveal that benefits from any conferences or workshops depends on participant's interest and level of participation, active and passive participants have different take home. However, head teachers of Faith-Based schools report more participation than those in Government schools. Both principals and head teachers in these schools said they allow staff to attend conferences/ workshops in special education provided it has no cost on the school. One of the head teachers said, "any member of staff who indicate interest in conference/workshop is permitted but must apply for permission, attaching evidence of invitation which will be forwarded to the ministry for written approval. However, any one organized during holidays does not require official permission but it does not impact on instruction for learners with dysgraphia" In all of these, widely held opinions of respondents is that, it does not directly influence teachers utilization of accommodations in teaching learners with dysgraphia. However, Osuorji (2019) revealed that gains from participation in conferences/ workshops depends on the location of the school, teacher's level of education, career aspirations of teachers and more of the likes.

#### Conclusion

The main thrust of this study focused on the influence of teachers teaching experience and participation in conferences/workshops on utilization of instructional accommodations in educating learners with dysgraphia in schools. Ideally, teaching experience and participation in conferences/workshops are regarded as way of building the capacity of teachers but the results of this study has indicated otherwise. While the findings or result of this study remains credible and usable in the research community, this research-based evidences spice intellectual efforts in this special needs conditions generally and particularly in dysgraphia, that has been neglected when compared with other sub-types of learning disabilities in Nigeria.

#### Recommendations

It is therefore recommended among others that:

- 1. Teaching responsibilities as it concerns learners with dysgraphia and the use of instructional accommodations should not be allocated based on teachers experiences,
- 2. Teaching leaners with the disability should not be based on participation in conferences because it does not solely determine teachers' ability to use instructional accommodations. However, teachers should be encouraged to attend to acquire knowledge in other areas,
- 3. School authorities should de-emphasize seniority criteria as a means of meeting instructional needs of learners with dysgraphia,
- 4. Teachers should be re-trained to acquire specific competency on use of instructional accommodations, to be able meet needs of learners who are dysgraphic in the school system.

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#### EFFECTS OF ENVIRONMENTAL VARIABLES ON IMPLEMENTATION OF AGRICULTURAL SCIENCE CURRICULUM IN AKWA IBOM NORTH-EAST SENATORIAL DISTRICT OF AKWA IBOM STATE

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#### Abstract

This study was conducted to examine the effects of environmental variables on implementation of agricultural science curriculum in Akwa Ibom North East Senatorial District. To achieve the aim of the study, three research questions were raised and three hypotheses formulated. The study adopted ex- post facto research design. The population comprised 2,230 students from the 89 public senior secondary school two (SS II) students studying agricultural science and a sample of 637 were purposively selected from 20 schools. Data were collected using an instrument titled: Environmental variables and implementation of agricultural science curriculum Questionnaire (EVIASCQ). Research questions raised were answered using mean and standard deviation while analysis of variance was utilized to test the null hypotheses formulated. From the data analysed, it was found that there is a significant difference of class size, school location and laboratory facilities on implementation of Agricultural Science Curriculum. However this paper recommended among others that Government should reduce class size and provide adequate laboratory facilities to aid the implementation of Agricultural Science curriculum.

Keywords: Environmental Variables, Curriculum Implementation, Agricultural Science

#### Introduction

Agriculture is one of the key sectors of an economy which provides the basic needs of people and a high proportion of the people depend on it for their livelihood. Agriculture is also branded as "The backbone of an economy". It is a sector which contributes a high percentage of the Gross Domestic Product (GDP) of developing countries. The study of Agricultural Science in our schools is of paramount importance in the growth and development of the economy of our country which is endowed with natural resources that need to be harnessed judiciously for the satisfaction of mankind (Ndem & Akubue 2016). The fact is that this discipline has been in existence in our school curriculum since the colonial era. The study of Agricultural Science is not a new subject in our school curriculum yet it does not seem to yield desired result as what obtains in the developed world. We need to question ourselves on the factors responsible for the sluggish progress in agricultural production in Nigeria.

It is unfortunate that in majority of our public schools agriculture is being taught theoretically with little or no practicals (Alabi, 2014). It is important to introduce the children to the practical aspects of the subject at their tender ages to enable them see the beauty of agriculture because leaving out the practicals becomes a major concern and a challenged to the production and increase of food crops in the country. Non availability of school farms, farm implements and tools can hinder the effective Implementation of Agricultural Science curriculum.

The study of Agricultural Science in our schools is affected by some variables. These variables could be environmental variables. Environmental variables are external factors that exist in an individual physical environment that influences behaviour. The importance of environmental variables in realizing educational goal and objectives in any education system cannot be over-emphasized. In this contest, environmental variables are class size, school location and availability of laboratory facilities. These variables can affect the teacher's interest, beliefs, perceptions, aspirations and value system and their responses to implementation of Agricultural Science curriculum.

Class size is an important variable that affect effective implementation of Agricultural Science curriculum. There is no doubt that students in small class size (ie with teacher-student ratio of 1: <40) do better than students in large class size (i.e with teacher-student ratio of 1: >40). In large class size there is always disruption of classes by students. Small class size allow teachers to give more individualized attention to students, it helps teachers to manage their classroom better and also help teachers provide more effective instruction that leads to excellent performance of the students. In our public secondary schools today students numbers up to 100 and more per class and there is no space in class for the teacher's movement. The little space left for the teacher is close to the chalkboard, thus, it is impossible for the teacher to move around the class to inspect students' work. The classes are jampacked that even the students have to climb on their lockers to move out of the class. Examination malpractices cannot be prevented in such situation. Classroom management is one of the most important aspects of effective teaching but this cannot be achieved with large class size.

On how school location affect the implementation of Agricultural Science curriculum, schools in the rural areas are seen as inferior, local and lacks learning facilities. Many teachers reject posting to schools in rural areas as a result of inadequate amenities and this affect implementation of the curriculum. Schools in the rural areas lack continuity in their curriculum. Teachers in urban schools are busy with their businesses that they rarely attend classes. Most schools in urban lacks facilities too as their host communities does not help matters by invading the schools, stealing and destroying school facilities.

Laboratory provides controlled conditions in which scientific experiments are performed. Most schools lack Agricultural Science laboratory and the few schools with laboratory lack facilities. Lack of laboratory facilities has serious implication on implementation of Agricultural Science curriculum. Agricultural Science is a subject that should be taught practically than theoretically. The Agricultural Science laboratory should have simple farm tools such as holes, cutlasses, spade, headpans, fertilizer, seeds, soil samples etc. It is very sad that most students in public secondary schools cannot plant a simple crop like cassava. Non availability of laboratory facilities can hinder effective implementation of Agricultural Science Curriculum.

According to Federal Ministry of Education (FRN) (2008), teachers are of paramount importance in curriculum implementation. A curriculum cannot reach the objectives for its formulation without the implementation stage. Teachers are the main force and the last group that ensures that any curriculum is implemented according to specification. Classroom teachers decides on what to teach at what time even when some kind of teaching scheme may have been prepared in advance for them.

In the National Policy on Education (FRN) (2008), teachers' competency is a functional delivery mechanism for the effective implementation of the 9 - 3 - 4 educational system. The document stipulates expected qualities of teachers' job performance as competence, professional commitment and efficiency. These are demonstrated by teachers in the classroom through quality in the science of work, lesson plans and the actual instructing and teaching methods. The most important task of the teacher is that of translating the curriculum document into the operational or practical curriculum and functional knowledge by the combined effort of the learners, teachers and other educational personnel (Mkpa, 2012). It therefore entails the interaction of the teachers, the learners and the curriculum materials. However, when it comes to the selection of instructional strategies for effective implementation, the classroom teacher becomes the decision maker. Obviously, the aspect of the teachers' work with which they tend to feel most competent and comfortable and exercise with prerogative is very paramount. Viewed from this angle, effective teaching and learning is a pointer to the condition and degree to which educational goals and curriculum provisions are being attained or have produced results.

According to Edidem (2010), to be effective, a teacher should assume the role of an instructor, a motivator, a role model and a welfare officer whose other responsibility is to create a relaxed and enabling environment of acceptance to the learner. Implementation is the moving force in any educational enterprise and in the context of curriculum planning, it bridges the gap between theory and practices. Curriculum implementation is every essential if learners are to gain meaningful educational experience and broad exposure. Effective curriculum implementation could be seen as a communication process resulting in a change of the learners' behaviour. Effective and skilful implementation guides the learning process. According to Sportsman (2010), the basic factors in effective teaching and curriculum implementation include teachers' skill in planning and presentation; classroom discipline and management, teacher's participation in extra curricular activities, co-operation with school authorities, concerns for learners' needs and resourcefulness. The role of the teacher in translating curriculum document into practical and functional knowledge cannot be over emphasized.

Curriculum implementation is the translation of the prescribed curriculum document into reality (Okorafor, 2012). Accordingly, curriculum implementation involves the means of executing the intended desires of the curriculum planners. The aims and objectives of education as carried and portrayed by the curriculum are executed for effective educational functions through the implementation. When curriculum content is adequately implemented

with the appropriate materials needed for it, a lot is achieved in the learners. A learner who is well grounded in appropriate skills and competences becomes not only effective but also competent and contented individual in his future time. Effective curriculum content implementation could be called effective instruction, which inspires and makes learners active in achieving instructional objectives, keeping to positive attitude, as well as applying the experiences gained to other situations. It is an effective teacher that can only achieve these. An effective teacher is seen as one who has the power to affect actions in the classroom activities to achieve in finding ways of doing things. He is imaginative and combines different methods of teaching in order to produce intended useful results. Kano (2012) observed that the teacher provides instructional leadership in the classroom by creating a psychologically conducive, stimulating and challenging atmosphere from the beginning to the end of each lesson's session. When the teaching and learning processes are made interesting with the learning experiences relating to the daily needs and aspirations of the learners, they will be compelled to participate actively.

According to Ekpo (2013), teachers provide curriculum intentions. They select what to teach and decide on when and how to teach. The selection of what to teach and the decision on what and how to teach constitute the essential aspects of curriculum implementation. When curriculum is constructed and put forward for educational services the next immediate tendency is the implementation of what is set forward. The success or failure of the implementation rests squarely on the teacher, for he brings the learner on a face to face encounter with all adequate learning activities. Offorma (2014) advises that teachers should plan their lessons well and adopt appropriate teaching models so as to set up appropriate learning opportunities for learners to engage in. In secondary schools in Akwa Ibom North East, Agricultural Science is taught theoretically with little or no practicals.

Olajide, Odoma, Okechukwu, Iyare and Okhaimoh (2015) conducted a study which was intended to determine the problems of implementation of agricultural practical in Agricultural Science curriculum in secondary schools in Delta State. Three objectives guided the study. The population comprised of 456 registered Agricultural Science Teachers. Sample size of 246 respondents was drawn using Stratified random sampling technique. Data was collected from respondents using structured questionnaire. The results of the analysis revealed that the Agricultural Science Teachers in Delta State were qualified to teach Agricultural Science. However, most schools have the required instructional materials to teach practical agricultural practical. The result showed that students in the schools view Agricultural Science as not important as Mathematics and English Language which they view as core subjects. Also, the finding of the study revealed that overcrowded classroom (large class) as one of the major factor confronting the effective implementation of Agricultural Science practical in secondary schools.

Ndem and Akubue (2016) assessed the status of implementation of Agricultural Science curriculum and Home Economics in secondary schools in Afikpo Education zone. The study adopted descriptive survey method. The population of the study was 2,916, while the sample for the study was 215 pre-vocational teachers and agricultural science and home economics students. The study was carried out in Afikpo Education Zone Ebonyi State. The instrument used for data collection was a self-structured questionnaire. The reliability of the instrument was determined by the use of cronbach alpha, and the reliability coefficient was 0.84. Data

were analyzed using frequencies, percentage and independent t-test. Result findings showed that large class size has significant influence on the implementation of Agricultural Science Curriculum in Afikpo Education zone. Based on the above, this study focuses on determining the effects of environmental variables on implementation of agricultural science curriculum in Akwa Ibom North-East Senatorial District.

#### Statement of the Problem

Agricultural Science is a utilitarian subject in the secondary school curriculum. One major aim of teaching the subject in secondary schools is for the students to develop an understanding of agriculture and its importance to the family and the nation. This aim cannot be realized when students perform poorly in Agricultural Science at most levels of education like in Senior Secondary II Examinations, West African Examination Council (WAEC) and National Examination Council (NECO). Few students now enroll for Agricultural Science in senior secondary school. This poor performance along with poor enrollment in the subject at the senior secondary school level is a matter of much concern in the country given that Nigeria is an agrarian society.

Teachers are the most important human resource in curriculum implementation since they are the ones who adopt and implement the ideas and aspirations of the designers. This implies that the success of the curriculum depends on the teachers. Most public secondary schools lack sufficient teachers. A sufficient supply of trained teachers is therefore needed if the implementation of the curriculum is to be effective. In Nigeria learning institutions have been for a long time experiencing a shortage of the teaching staff and the rural areas are the most affected since teachers shun those areas. Teacher pupil ratio is too high and in some cases, untrained teachers are involved. When a school does not have enough teachers, the few that are there are overstretched and overloaded, hence they are overworked which in turn affects their capacity to teach effectively. In the case of senior secondary schools, for example, where there is specialization in terms of teaching subjects, some subjects are not offered in certain schools even though they appear in the curriculum because of trained teachers in those subjects are not available.

Also, since the quality of education is as good as the quality of teachers, it follows that if the quality of teachers is poor, the quality of education will be poor. What this means, is that the quality of teachers will determine the effectiveness of curriculum implementation. What then could be responsible for the poor implementation of the Agricultural Science curriculum? Could it be related to environmental variables such as class size, school location and laboratory facilities? It is pertinent to determine with empirical evidence how environmental variables contribute to teachers' implementation of Agricultural Science curriculum.

### **Purpose of the Study**

The purpose of the study is to investigate the effects of environmental variables on the implementation of Agriculture Science Curriculum in senior secondary schools. Specifically, the study sought to:

- 1. Examine the influence of class size on implementation of Agricultural Science Curriculum;
- 2. Ascertain the influence of school location on implementation of Agricultural Science Curriculum;

3. Examine the influence of availability of laboratory facilities on the implementation of Agricultural Science curriculum;

#### **Research Questions**

- 1. What is the difference in Implementation of Agricultural Science Curriculum based on class size?
- 2. What is the difference in the implementation of Agricultural Science curriculum based on school location?
- 3. What is the difference in the implementation of Agricultural Science based on based on availability of laboratory facilities?

#### Null hypotheses

- 1. There is no significant difference in the implementation of Agricultural Science curriculum based on class size.
- 2. There is no significant difference in the implementation of Agricultural Science curriculum based on school location.
- 3. There is no significant difference in the implementation of Agricultural Science Curriculum based on availability of laboratory facilities.

#### Methodology

The research design used for the study is ex-post facto design. This design is to examine the influence environmental variables being class size, school location and availability of laboratory facilities on the implementation of Agricultural Science Curriculum. These variables under investigation were already on ground and could not be manipulated.

The population consists of all the 2,230 Senior Secondary Two Students (SS II) offering Agricultural Science in the 86 public secondary schools in Akwa Ibom North East Senatorial District from which a sample size of 637 students and 60 teachers were sampled using purposive sampling technique. The instrument used for data collection was a researcher designed scale entitled "Environmental Variables and Teachers' Implementation of Agricultural Science Curriculum Questionnaire" (EVTIASCQ). The EVTIASCQ is divided into sections A and B. Section A elicits information on environmental Variables such as, class size, school location and availability of laboratory facilities. Section B consists of 20 items which was subdivided into variables and had five (5) items to measure the teachers' level of implementing the curriculum as perceived by the students. The EVTIASCQ is a 4-point rating scale questionnaire. The responses items range from Strongly Agree (SA)= 4 point, Agree (A)=3 point, Disagree (D)=2 point, to Strongly Disagree (SA)=1 point. The instrument "Environment Variables and Teachers' Implementation of Agricultural Science Curriculum Questionnaire" (EVTIASCQ) was face validated.

Data obtained were analyzed and descriptive statistics of mean and standard deviation were used to answer the research questions while independent t-test was used to test hypothesis 2 and ANOVA was utilized to test hypotheses 1 and 3 at 0.05 level of significance.

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#### Results

**Research Question 1:** What is the difference in the implementation of Agricultural Science Curriculum in public secondary schools in Akwa Ibom North-East Senatorial District based on class size?

Table 1:	<b>Teachers'</b>	implementation	of Agricult	ural Science	e curriculum	based	on	class
	size							

Class size	Ν	$\overline{X}$	SD
Small	124	77.12	11.89
Average	136	75.55	11.44
Large	377	68.93	11.88

Result presented in Table 1 reveals those Agricultural Science teachers in small class size (1-20) secured means score of 77.12 while Agricultural Science teachers in average class size (21-40) and large class size (41 and above) secured mean implementation score on Agricultural Science Curriculum implementation of 75.55 and 68.93 respectively. Judging based on the mean curriculum implementation score, it can be deduced that Agricultural Science teachers who teaches large class size (41 and above) secured the lowest curriculum implementation score, while those Agricultural Science teachers who teaches small class size (1-20) scored the highest mean score on Agricultural Science Curriculum implementation. This result means that Agricultural Science teachers who teaches small class size (1-20) exhibited better implementation of Agricultural Science Curriculum than Agricultural Science teachers who teaches average class size (21-40) and large class size (41 and above). Hence, there is a difference in the implementation of Agricultural Science Curriculum in public secondary schools based on class size.

**Research Question 2:** What is the difference in the implementation of Agricultural Science Curriculum in public secondary schools in Akwa Ibom North-East Senatorial District based on location?

# Table 2:Teachers' implementation of Agricultural Science curriculum based on<br/>school location

School location	Ν	$\overline{X}$	SD
Urban	372	73.54	11.92
Rural	265	69.68	12.55

Result summarized in Table 2 shows those Agricultural Science teachers in secondary school in the urban secured mean Agricultural Science Curriculum implementation score of 73.54 while Agricultural Science teachers in secondary schools in the rural had a mean score of 69.68 on implementation of Agricultural Science Curriculum. This result reveals that Agricultural Science teachers in secondary schools in the urban areas implement Agricultural

Science Curriculum better than their counterparts in secondary schools in the rural areas. Therefore, there is a difference in the implementation of Agricultural Science Curriculum in public secondary schools in Akwa Ibom State North East Senatorial District based on school location with Agricultural Science teachers in secondary schools in the urban having an edge over their counterpart in secondary schools in the rural.

Research Question 3: What is the difference in the implementation of Agricultural Science Curriculum in public secondary schools in Akwa Ibom State North-East Senatorial District based on availability of laboratory facilities?

Laboratory facilities	Ν	$\overline{X}$	SD
Very inadequate	247	68.56	12.13
Inadequate	89	71.72	15.03
Adequate	169	72.16	9.47
Very adequate	132	78.16	11.62

#### Table 3: Teachers' implementation of Agricultural Science curriculum based on availability of laboratory facilities

Result in Table 3 show that students who were exposed to very adequate laboratory facilities rate their teachers higher on the implementation of Agricultural Science Curriculum (78.16) than those that are exposed to very inadequate laboratory facilities (mean score = 68.56), inadequate(mean score =71.72) and adequate laboratory facilities (mean score =72.16). This result implies that the availability of laboratory facilities enhances the implementation of Agricultural Science Curriculum in public secondary schools in Akwa lbom North East Senatorial District. Hence, there is a difference in the implementation of Agricultural Science Curriculum in public secondary schools in Akwa Ibom State North-East Senatorial District based on availability of laboratory facilities with Agricultural Science Curriculum better implemented in secondary schools where laboratory facilities are adequately provided than those that have inadequate laboratory facilities.

Hypothesis 1: There is no significant difference in the implementation of Agricultural Science Curriculum in public secondary schools in Akwa Ibom State North-East Senatorial District based on class size.

Table 4:	ANOVA	summary	on	the	implementation	of	Agricultural	Science
	curriculu	m based on	clas	s size	<b>)</b>			

Sources of variation	Sum of	df	Mean	F-cal.	F-crit.	Decision at	
	Squares		Square			p<.05	
Between Groups	8521.597	2	4260.798	30.67*	3.01	Ho <sub>1</sub> is rejected	
Within Groups	88083.892	634	138.934			5	
Total	96605.488	636					
*significant at $n < 05$							

significant at p<.05

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Result in Table 4 reveals that the F- calculated (30.67) is greater than the F- critical (3.01) at .05 level of significance. The null hypothesis is rejected. Therefore, there is a significant difference in the implementation of Agricultural Science Curriculum in public secondary schools in Akwa Ibom State North East Senatorial District based on class size. Also, since the result of analysis shows significant difference in implementation of Agricultural Science Curriculum based on class size, the Post Hoc Test using Duncan's test was used to examine which category of class size is significantly different from the other. The result shows that implementation of Agricultural Science curriculum was not significantly different in class sizes 1-20 and 21-40, though they were in the same subset.

#### Table 5: Duncan post-hoc test of implementation of Agricultural Science curriculum based on class size

Class size	Ν	Subset for alpha = 0.05			
		1	2		
41 and above	377	68.9284			
21-40	136		75.5515		
1-20	124		77.1210		
Sig.		1.000	.226		

Means for groups in homogenous subsets are displayed. Class sizes of 21-40 and 1-20, though in the same subsets are not significantly different. The difference lies between these two classes and that whose size is 41 and above.

Hypothesis 2: There is no significant difference in the implementation of Agricultural Science Curriculum in public secondary schools in Akwa Ibom State North-East Senatorial District based on school location.

School location	Ν	Mean	SD	t-cal.	t-crit.	Decision at p<.05
Urban	372	73.54	11.92	3.94*	1.96	Ho <sub>2</sub> is not Rejected
Rural	265	69.68	12.55			5

#### Independent t -test summary on the implementation of Agricultural Table 6: Science curriculum based on school location

n=637, df = 635. \* =significant at p<.05.

Result presented in Table 6 reveals that t-calculated (3.94) is greater than the t-critical (1.96) with 637 degrees of freedom at 0.05 level of significance. The null hypothesis is rejected. Hence, there is a significant difference in the implementation of Agricultural Science Curriculum in public secondary schools in Akwa Ibom State North-East Senatorial District based on school location.

**Hypothesis 3:** There is no significant difference in the implementation of Agricultural Science curriculum in public secondary schools in Akwa Ibom State North-East Senatorial District based availability of laboratory facilities.

Table 7:	ANOVA summary on the implementation of Agricultural Science
	curriculum based on availability of laboratory facilities.

Squares	DI	Square	F-cal.	F-crit.	p<.05
7958.478	2	2652.826	18.94*	3.01	Ho <sub>3</sub> is rejected
88647.010	634	140.078			5
96605.488	636				
	<b>5quares</b> 7958.478 38647.010 96605.488	Squares         D1           7958.478         2           38647.010         634           96605.488         636	Squares         Square           7958.478         2         2652.826           38647.010         634         140.078           96605.488         636         140.078	Squares         Square         I can           7958.478         2         2652.826         18.94*           38647.010         634         140.078           96605.488         636         140.078	Squares         Square         Feature         Feature           7958.478         2         2652.826         18.94*         3.01           38647.010         634         140.078         96605.488         636

\*significant at p<.05

Result summarized in Table 7 reveals that the F- calculated of 18.94 is greater than the Fcritical of 3.01 at .05 level of significance. The null hypothesis is rejected. Therefore, there is a significant difference in the implementation of Agricultural Science Curriculum in public secondary schools in Akwa Ibom State North East Senatorial District based on Availability of laboratory facilities. The Post Hoc test using Duncan test was performed to determine which group is significantly different from others. Result reveals that secondary schools that had very adequate laboratory facilities have better implementation of Agricultural Science Curriculum than those with adequate, inadequate and very inadequate laboratory facilities. This result implies that adequacy of laboratory facilities enhances the implementation of Agricultural Science Curriculum in public secondary schools.

# Table 8:Duncan post-hoc test of implementation of Agricultural Science<br/>curriculum based on availability of laboratory facilities

Availability of Laboratory facility	Ν	Subset for alpha = 0.05			
		1	2	3	
very Inadequate	249	68.5622			
Inadequate	87		71.7241		
Adequate	169		72.1598		
Very adequate	132			78.1591	
Sig.		1.000	.760	1.000	

Means for groups in homogeneous subsets are displayed. Inadequate and adequate are in the same subset, while very inadequate and very adequate are in different subsets.

#### **Discussion of the Findings**

The analysis of research question 1 revealed that the result Agricultural Science Curriculum teachers in public secondary school who were exposed to class size of 1-20 students are better disposed to the implementation of Agricultural Science Curriculum than those exposed

to class size of 21-40 and 40 and above students. One possible explanation for this result is that overcrowded class size put the teacher at a stress, makes the teachers frustrated and also makes effective monitoring and assessment of the students to be a daunting task. When a teacher is frustrated in the classroom as a result of large class size, it is possible that such a teacher may not be able to implement the Agricultural Science Curriculum effectively.

This finding agrees with that of the finding by Olajide, Odoma, Okechukwu, Iyare and Okhaimoh (2015) on the implementation of agricultural practical in Agricultural Science curriculum in secondary schools in Delta State where significant difference was established in the implementation of practical Agricultural Science as one of the aspect of Agricultural Science curriculum based on school size. Olajide, Odoma, Okechukwu, Iyare and Okhaimoh (2015) finding established that secondary school with small class size implement the Curriculum better than secondary schools with large class. This finding also agrees with that of the finding by Ndem and Akubue (2016) on the status of implementation of Agricultural Science curriculum and Home Economics in secondary schools in Afikpo Education zone where class size was found to have a significant influence on the implementation of the Agricultural Science curriculum in Afikpo Education zone.

The result of the analysis of the research question 2 showed that the Agricultural Science Curriculum is better implemented in secondary schools in the urban area than secondary schools in the rural areas. The result of the hypothesis indicated significant difference in the implementation of Agricultural Science Curriculum based on school location. This conclusion was arrived at as the t-calculated was greater than the t-critical value. One possible explanation of the differences in the implementation of Agricultural Science Curriculum between secondary schools in the urban and rural could be as a result of the fact that secondary schools in the urban area possibly due to their location are easily monitored by the State Ministry of Education unlike schools in the rural where the roads are not motorable and hence make effective monitoring almost impossible. This monitoring and supervision which can easily be carried out in secondary schools in the urban areas could make the Agricultural Science teachers to be on their toe and show more readiness to implement the Agricultural Science Curriculum. Another possible explanation for the result is that secondary schools in the urban have access to adequate facilities than secondary schools in the rural area and hence enhance the implementation of Agricultural Science Curriculum. Secondary schools in the rural areas lack adequate teachers as majorities wants to stay in the urban. This finding is in line with that of the finding by Alabi (2014) on the implementation of the new senior secondary school curriculum in Ondo State which established significant difference in the implementation of the secondary school curriculum based on school Finding by Alabi (2014) showed that secondary schools in the urban areas location. implement secondary school curriculum better secondary schools in the rural areas. This finding is also in line with that of Achimugu (2016) on factors affecting effective implementation of the senior secondary education chemistry curriculum in Kogi State, Nigeria where school location was found to be one of the major factors.

The result shows that Agricultural science teachers of secondary schools with available laboratory facilities implemented the Agricultural science curriculum better than those who had no or rarely had, available laboratory facilities. This result could be due to the fact that laboratory facilities enhanced teaching process. This findings agrees with that of the finding by Nwankwo, Nwogbo, Okorji and Egboka (2015) on the adequacy of learning facilities for

implementing entrepreneurship education programme in secondary schools in Anambra State where adequacy of school facilities such laboratory facilities was found to enhance the implementation of education programme in secondary schools in Anambra State. This finding is also in line with that by Ibijoke (2012) on the impact of school facilities on teaching and learning in secondary schools, which established that school facilities has significant influence on the implementation of education.

#### Conclusion

On the whole, environmental variables highly enhance the teachers' implementation of Agricultural Science Curriculum. Based on the findings of the study, it has been concluded that teachers' implementation of agricultural science can be improved by reducing the class size to 20, posting more teachers to schools in the rural areas and providing adequate laboratory facilities.

#### Recommendations

- 1. The class size of students should be 20 students per class.
- 2. More teachers should be posted to schools in the rural areas as these schools lack teachers due to teachers preference for schools in urban areas.
- 3. Agricultural Science laboratories should be provided in all public schools with adequate facilities.

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## INFLUENCE OF KNOWLEDGE OF THE IMPLICATION OF NOISE ON ATTITUDES OF UNDERGRADUATE STUDENTS TO PREDISPOSING FACTORS IN LAGOS STATE

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## Abstract

Noise is present everywhere but becomes hazardous when the intensity and frequency affect human functioning in term of ability to perceive acoustic information adequately and other health issues. This study investigated the influence of the implication of noise on attitudes of undergraduate students to predisposing factors in Lagos State. The study employed descriptive survey research design. The population for the study was undergraduate students in University of Lagos and Lagos State University. A total of 452 undergraduate students were sampled through stratified sampling technique. Three hypotheses were formulated for testing at 0.05 level of significance. Noise knowledge and predisposing factors attitudinal scale (NKPFAS) with reliability of 0.71 using Cronbach Alpha was used to collect data. The data collected was analysed using t-test. and the results revealed that there is significant negative relationship between knowledge of the implication of noise to human hearing and attitude to predisposing factors among undergraduate students in Public Universities in Lagos State, there is significant difference in the knowledge of implications of noise between male and female undergraduate students and there is also significant difference in the attitude of male and female undergraduate students to predisposing factors of noise. It is recommended that young adults should be intimated with the risks involved in exposing self to noise beyond certain as this can lead to fundamental health issue.

Keywords: Knowledge, Attitudes, Noise, Predisposing Factors, Undergraduate Students

# Introduction

Noise is essential evil in the environment as every society generates different levels of noise, and the frequency and intensity differs from society to society occasioned by level of development and modernisation. Man's society is filled with sound as information vital to life are derived from sound environment. However, sound becomes noise when it is unwanted and may be hazardous to health, interfere with speech and verbal communications or is otherwise disturbing, irritating or annoying. Conventionally, there is no difference between

sound and noise. Sound is a sensory perception and noise corresponds to undesired sound (Commonwealth of Australia, 2018). Nevertheless, noise can be defined as "unwanted sound", and an audible acoustic energy that adversely affects the physiological and psychological well-being of people, or which disturbs or impairs the convenience or peace of any person. Sound therefore becomes noise when it hinders speech communication, impedes the thinking process; interferes with concentration; obstructs activities (work or leisure); or presents a health risk due to hearing damage and physiological disorganisation to the listeners.

Noise is present in every human activity. Wherever there is sound, there will be noise depending on its implication on man's activities and the nature of the environment where the sound is being projected. When assessing its impact on human well-being, it is usually classified either as occupational noise, that is noise in the workplace or as environmental noise, which includes noise in all other settings, whether at the community, residential, or domestic level in form of traffic, playgrounds, sports, music, household machineries and small or large construction in the neighbourhood (Murphy, King, & Rice, 2009).Noise is probably one of the most widespread and underestimated hazards in human community as it is considered essential life commodity. Noise is a complex issue to measure as it has several important properties that coloured the loudness, duration and frequencies (Drew, Macfarlane, Oiamo, Mullaly, Stefanova, & Campbell, 2017). Whichever colouration, noise may portend serious challenges to man's healthy living.

Noise is considered a biological stressor and a component of one's physical environment, and this therefore one of the determinants of health (Mikkonen & Raphael, 2010). Noise has been reported to be one of the causalities of health challenges whether directly or indirectly. The consequences of noise is based on both noise as heard by the observer (auditory health consequence) and individual sensitivities to noise, with physical and psychological mediators influencing psychological and physiological reactions (the non-auditory impacts of noise exposure) (Murphy & King, 2014).

Noise has been found to be one of the causes of hearing loss in man. It has been reported in literature that hearing loss of this nature is irredeemable. For a long time, the main health concern related to noise was focus on occupational exposure hearing loss. The World Health Organization has posited that noise-induced hearing loss is unlikely when average daily exposure to noise is below 70 dBA and impulse sound levels do not exceed 110 dBA(World Health Organization, 2009, 2011). Unfortunately, the impact of noise is cumulative and noise of this nature and duration can still lead to hearing impairment. On the other hand, in some cases personal noise exposure based on choices made, such as ear buds and personal listening devices, operating small equipment without protection or attending concerts and events have been reported in the recent times as sources of risky noise that impair auditory sensitivity (Drew, Macfarlane, Oiamo,Mullaly, Stefanova, & Campbell, 2017).

In the recent time, researches have investigated beyond the impact of noise on hearing alone to some other health issues. There has been growing interest in the non-auditory impacts of environmental noise on health. In 2009, the World Health Organization Regional Office for Europe released its Night Noise Guidelines for Europe and in 2011 the Burden of Disease from Environmental Noise. From these comprehensive reviews, the WHO recommended that outdoor noise levels do not exceed an average of 55 dBA during the day and an average of 40

dBA at night (Toronto Public health, 2017).Noise exposure has been linked to cardiovascular tension (Babisch, 2005 in Bodinet al., 2016) with an increased risk of mortality from myocardial infarction (Gan, Davies, Koehoorn, & Brauer, 2012), cognitive impairment in form of poor attention span and memory loss (Wright, Peters, Ettinger, Kuipers, & Kumari, 2016), sleep disturbance (World Health Organization, 2009), mental health (Van Kempen & Van Kamp, 2005 cited in Babisch, Schulz, Seiwert, & Conrad, 2012) and recently, diabetes (Recio, Linares, Banegas & Díaz., 2016).

Researches have investigated the relationship between knowledge and attitude of young adults to loud noise and the risk of developing hearing disorders (Widén & Erlandsson, 2004; Widén, Holmes & Erlandsson, 2006; Vogel, Brug, Van Der Ploeg, & Raat, 2007; LandälvMalmström, & Widén, 2013). Lass, Woodford, Lundeen and Lundeen (1987) in Manchaiah, Zhao & Ratinaud (2019) conducted a survey that the finding revealed that students had very poor knowledge in certain areas related to hearing health. Although the majority of participants were aware of the risk for hearing damage caused by noise exposure, limited knowledge was found in the areas related to the mechanisms of hearing loss and hearing health awareness, particularly regarding the facts of permanent irreversible hearing damage resulting from loud noise with high frequency. Hunter (2018) also noted that lack of appropriate levels of knowledge can be adjudged to be reason why young adults in most institutions engage in some noisy activities with less concern about their implication to their health and hearing.

Attitudes towards noise and hearing protection are likely to influence young adults' behaviour to some predisposing factors. In general, young adults who have the most positive attitudes towards risk- taking behaviour are more likely to engage in risk-taking activities and less likely to use protective strategies (Bohlin, Sorbring & Erlandssson, 2010). Recent studies in the UK and Belgium found a high prevalence of temporary noise induced hearing problems(NIHP) in students and yet the use of hearing protection was minimal and the majority said the risk of hearing damage would not affect their nightclub attendance (Gilles, Van Hal, De Ridder, Wouters & Van de Heyning, 2013; Johnson, Andrew, Walker, Morgan & Aldren, 2014). Similar study in US also found that when University students were questioned about hearing problems that can occur when noise is too loud, only 15% of considered tinnitus as a symptom to be concerned about (Crandell, Mills & Gauthier, 2004). It is easy to infer that if such attitude is found among young adults in developed economies, Africa, especially the sub-Sahara Africa will have the worse attitude because of lack of hearing protection education and monitoring by relevant agency.

Some important influencing factors related to knowledge of and attitudes toward loud noise exposure and the use of hearing protection were also linked to some factors such as age, gender, educational level, ethnicity, music preference, physical activity, socioeconomic factors, and cultural perspectives. Warner-Cryz and Can (2016) conducted a study on age and gender differences in children and adolescents' towards noise reported gender implication as boys were found to be engaging in significant high risk noise activities than girls. Although, this finding may be contentious, nevertheless, it serves as empirical basis for further investigation.

Young adults are involved in various activities such as concerts, discotheques, clubs, and sporting events that expose them to loud noise, increasing their risk of developing noise

induced hearing loss (NIHL) and other noise induced health problems. Various studies have shown that NIHL and other hearing symptoms are increasing in the younger population in the United States (Niskar, Kieszak, Holmes et'al., 2001) and other developed countries (West & Evans, 1996; Sadhra, Jackson, Ryder & Brown, 2002). Noise in recreational and leisure activities has been linked to NIHL in the exposed population (Dalton, Cruickshanks, Wiley et'al, 2001) which is becoming a cause of concern for the young population because of its exposure to such activities due to level of their engagement and unconcerned attitudes towards the dangers inherent. This study therefore investigated the influence of knowledge of the implication of noise on attitude of undergraduate students to predisposing factors in Public Universities in Lagos State.

# Hypotheses

The following hypotheses were tested at 0.05 level of significance

- 1. There is no significant relationship between undergraduates' knowledge of the implication of noise and attitudes to predisposing factors in Public Universities in Lagos State.
- 2. There is no significant difference in the knowledge of implications of noise between male and female undergraduate students in Public Universities in Lagos State.
- 3. There is no significance difference in the attitude of male and female undergraduate students to predisposing factors of noise in Public Universities in Lagos State.

# Methodology

A survey research design was adopted for the study. The design was chosen because it gives room for collecting data from a representative of a larger population for generalization of findings after analyses of data collected from based on the influence of knowledge of the implication of noise to human hearing on attitude to predisposing factors among undergraduate students in Lagos State. The target population for this study comprised undergraduate students in Public Universities in Lagos State. These institutions include University of Lagos, Akoka and Lagos State University, Ojo. A sample of 452 undergraduates was selected across the two public Universities using multi-sampling technique. Stratified sampling was used to sample Faculties in each of the institutions into humanities and sciences and medical sciences. Thereafter, convenience sampling was used to select participants in each of the institutions based on the strata. Convenience sampling was employed based on the availability of the participants and readiness to partake in the research work through consent forms distributed among undergraduates in locations used. Noise Knowledge and Predisposing Factors Attitudinal Scale (NKPFAS) was constructed to collect relevant information from the participants. The NKPFAS has two sections. Section A was used to gather background information about the participants. Section B was further divided into knowledge and attitudinal scales with each section constructed in 4-point Likert type scale of Strongly Agree as SA, Agree as A, Disagree as D, and Strongly Disagree as SD. A reliability coefficient of 0.71 was derived during the pilot study using Cronbach Alpha to determine the stability of NKPFAS. A typical item on the knowledge of the implication of noise scale was: "Noise can reduce the rate and range of man audibility" (SA, A, D, SD) while that on the attitude to predisposing factors scale was: "How often do you stay near loud speakers in your church/ Mosque whenever service is in progress?" (Most frequently, Frequently, Sometimes, Never).

Data were collected by first seeking permission from the Deans of Faculties used after the intentions of the research were made known to them. Thereafter, the students were met in groups to explain why the research is being carried out. Consent forms were given to students who indicated their readiness to participate in the study. After the consent forms had been fully attended to and those who indicated interest in study were sorted out, NKPFAS were distributed among them and the researchers waited for them to properly attend to items of the scale. Responses were thereafter collected from them and collated. Data gathered was analysed using descriptive and inferential statistics. Descriptive statistics used include mean and standard deviation, while inferential statistics used was t-test and Pearson Product Moment Correlation Coefficient. All the hypotheses were tested at 0.05 level of significance.

# Results

**Hypothesis One:** There is no significant relationship between undergraduates' knowledge of the implication of noise and attitudes to predisposing factors in public universities in Lagos State.

# Table 1:Relationship between knowledge of the implication of noise and attitude<br/>to predisposing factors among undergraduates in public universities in<br/>Lagos State.

Variable	Ν	Mean	Std. Dev.	Df	t-value	r-value	r-crit.	Sig.
Knowledge of Implication of Noise	452	44.97	5.21	451				
Attitude to Predisposing Factors of Hearing Loss	452	31.82	5.13		21.61	-0.248	0.195	.000

It was observed that the r-calculated value of -0.248 was derived as the relationship between knowledge of the implication of noise to human hearing and attitude to predisposing factors among undergraduate students. This shows an inverse relationship, which means that as knowledge about the implication of noise to human hearing increases, attitude to predisposing factors reduces and vice-versa. Besides, the correlation coefficient value was found to be greater than the r tabulated value of 0.195 given 451 degree of freedom at 0.05 level of significance. This led to the rejection of the null hypothesis. It was concluded that there exists a significant negative relationship between knowledge of the implication of noise to human hearing and attitude to predisposing factors among undergraduate students in public universities in Lagos State.

**Hypothesis Two:** There is no significant difference in the knowledge of implications of noise between male and female undergraduate students in public universities in Lagos State.

# Table 2:t-test summary of knowledge of implication of noise between male and<br/>female undergraduate students

Variable	Gender	Ν	Mean	Std. Dev.	df	t-cal.	t-crit.	Sig.
Knowledge of	f Male	213	44.15	5.550				
Implication of Noise	Female	239	45.69	4.789	450	2.934	1.966	0.047

The t-calculated value of 2.934 was derived as the difference between male and female in the knowledge of implications of noise. This value was found to be greater than the critical value of 1.966 given 450 degree of freedom at 0.05 level of significance. Consequently, the null hypothesis was rejected and alternative hypothesis accepted. Thus, it was concluded that there exists significant difference in the knowledge of implications of noise between male and female undergraduate students.

**Hypothesis Three:** There is no significant difference in the attitude of male and female undergraduate students to predisposing factors of noise in public universities in Lagos State.

# Table 3:t-test summary of attitude of male and female undergraduate students to<br/>pre-disposing factors of noise

Variable	Gender	Ν	Mean	Std. Dev.	df	t-value	t-crit.	Sig.
Attitude to	Male	213	32.65	4.825				
Predisposing					450	2 071	1 066	040
Factors of	Female	239	31.08	5.301	430	2.071	1.900	.040
Hearing Loss								

Analysis from Table 3 shows that male and female participants mean difference in attitude towards predisposing factors of hearing loss is 2.071. This value was found to be greater than the critical value of 1.966 given 450 degree of freedom at 0.05 level of significance. Hence, the null hypothesis was rejected and alternative hypothesis accepted. This shows that there is significant difference in the attitude of male and female undergraduate students to predisposing factors of noise.

#### Discussion

The results of the study revealed that there was negative significant relationship between knowledge of the implication of noise and attitude to predisposing factors among undergraduate students in public University in Lagos State. The implication of this is that the knowledge of the implication of noise to human hearing demonstrated by undergraduate students did not reflect in the attitudes to predisposing factors of noise among the participants. By implication, somebody may demonstrate adequate knowledge of risky condition but the knowledge may not reflect in the attitudes towards the risky condition. The finding is an eye opener to gap that exists between knowledge and attitudes which may form basis for exhibiting certain behaviour. The finding helps researcher to redirect focus to some important influencing factors related to knowledge of and attitudes toward loud noise exposure and the use of hearing protection which were attributed to some factors such as age, gender, educational level, ethnicity, music preference, physical activity, socioeconomic factors, and cultural perspectives rather to study knowledge in isolation. It also corroborate the research findings in UK and Belgium that found a high prevalence of temporary noise induced hearing problems (NIHP) in students and yet the use of hearing protection was minimal and the majority said the risk of hearing damage would not affect their nightclub attendance (Gilles, Van Hal, De Ridder, Wouters & Van de Heyning, 2013; Johnson, Andrew, Walker, Morgan & Aldren, 2014).

The finding further revealed that there exists significant difference in the knowledge of the implications of noise between male and female undergraduate students. From the result in Table 2, it is evident that female undergraduate students' demonstrated fairly high knowledge because female's means score is higher than male. The finding lends credence to the finding of the study conducted by Warner-Cryz and Can (2016) on age and gender differences in disposition of children and adolescents' towards noise reported that boys were found to be engaging in significant high risk noise activities than girls. This attitude emanates from the fact that male fold engage in experimentation and exploration as confirmation of their knowledge in certain topical issues. In essence, male take risk validating their knowledge serving as first-hand experience.

In addition, the study revealed there was significance difference in the attitudes of male and female to predisposing factors of noise among undergraduate students in Lagos State. This implies that attitudes of male and female undergraduate students differ as regards sources of noise that are inimical to their health. The significant differences between male and female attitudes to some predisposing risk factors emanate from the fact that male tend to take risk than female. Most of the time, male engages in a lot of exploration that is risky not minding the consequences. For instance, male engage in the operation of noise generating machine in industries, musical instrument that generate noise of high frequencies like disk jockey, construction and highly articulated machine amongst many. Taking up duties of such nature is believed to showcase their masculinity. This finding is line with the study of Bohlin, Sorbring, Widen and Erlandsson (2011) that found that female adolescents judge acoustic high-risk situations as more dangerous than males. This judgmental attitude predisposes female to greater likelihood of wearing hearing protective devices than their male young counterparts (Gilles, De Ridder, Van Hal, Wouters, KleinePunte, & Van de Heyning2012; Widen, Holmes & Erlandsson, 2006). It was further confirmed that young women were four times more likely than men to wear earplugs during concerts (Widen, Holmes & Erlandsson, 2006).

# Conclusion

This study is on influence of knowledge of the implication of noise on attitude of undergraduate students to predisposing factors in Lagos State. The study revealed that the knowledge of the implication of noise among the participants did not influence their attitudes to predisposing factors that generate harmful noise; there was also difference in the knowledge of the implications of noise between male and female undergraduate students in public universities in Lagos State. Female undergraduate students demonstrate high knowledge of the implication of noise than their male counterparts and the attitude male and female differ when talking about predisposing factors of noise among undergraduate students in public universities in Lagos State Female participants displayed right attitude to some predisposing factors of noise making them to avoid noise that can portend danger to their health.

# Recommendations

- 1. The outcomes of this study give insight to the fact that young adults should be educated on the dangers involved in exposing one's sense of hearing to noise beyond certain dBA, as this can lead to fundamental health issue inform of hearing loss of varying degrees.
- 2. There should be a general course sensitising all undergraduate students on the knowledge of hearing conservation.
- 3. Seminars should be organised among young adults by relevant agencies on the danger that noise can pose to man.
- 4. Government should make it a point of urgency and necessity to make functional law guiding and regulating noise with the maximum dBA that can be accepted in a community.

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Imo Bassey Enang

## SKILLS IMPROVEMENT NEEDS OF SMALL SCALE BUSINESS OPERATORS (SSBOs) FOR ECONOMIC GROWTH IN AKWA IBOM STATE

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# Abstract

This study sought to determine the level of skills improvement needs of small scale business operators for economic growth in Akwa Ibom State. Two research questions and two research hypotheses stated were answered and tested at .05 level of significance respectively. Survey design was adopted for the study. The population of the study was 2790 registered Small scale business operators in Akwa Ibom State and 96 business educators from the University of Uyo and Akwa Ibom State College of Education, Afaha Nsit. Simple random sampling technique was used to select 400 small scale business operators and business educators as sample of the study. Questionnaire with 10 items was used for data collection. The questionnaire was validated by three experts and Crombach Alpha technique was used to determine the reliability of the instrument, which yielded a reliability coefficient of 0.89. The findings of the study revealed that small scale business operators (SSBOs) need improvement in time management and credit management skills for economic growth of Akwa Ibom State. It was concluded that if time and credit management skills are improved upon by SSBOs in Akwa Ibom State, it would engender economic growth in the state. It was recommended among others that state and federal government agencies should partner to take their programmes across all the Local Government Areas in the State through seminars and workshops to upgrade the knowledge and relevant skills of small scale business operators suitable for enhancement of business organization.

Keywords: Skills Improvement Needs, Small Scale Business Operators, Economic Growth

# Introduction

Small scale business operators are those in business with the aim of profit maximization from their commercial activities. They operate business firms such as bakeries, eateries, law firms, medical outfits, poultries, palm oil processing mills among others. Their employment capacity ranges from 10 to 49 people. The Central Bank of Nigeria (2019) asserted that small scale business enterprises are rated in terms of assets and number of staff. Although some are involved in production and general commercial activities, most small scale enterprises operate majorly in distribution of goods and services.

Commercial activities of any town in the world is anchored and articulated by small scale business operators. Their contributions to the economic growth of the society cannot be ignored. Their involvement in the distribution of goods and services to the end users promotes the economic growth of the society in areas of employment, increased government internally generated revenue, poverty reduction, and reduction in the risk of consumers stunting for goods from far away distances. Due to inadequate skills on the part of their operators, their growth is often retarded and they find it difficult to metamorphose into medium or large scale enterprises. Small scale business enterprises which are in the last chain of distribution of goods before the consumers can equally make life easier through availability of goods. They help in providing employment to artisans and create income opportunities for the self-employed. Since government at all tiers cannot venture into general commerce, small scale business operators are involved in general commerce. Since they largely operate as sole proprietorship, they hardly expand or survive competitive business environment perhaps due to lack of exposure to certain skills. Personal observation of the researcher shows that small scale business operators in Akwa Ibom State hardly survive two decades of business as result of lack of or inadequate skills by their operators in areas of time and credit management. One of the reasons Modern Business Press in Uyo has survived for more than seven decades now is because the late owner of the business adopted several skills improvement training programmes for her operators in, time management and credit management. Yet other small scale business enterprises fold up their businesses while the owner(s) are still alive or shortly after the demise of the owner.

According to French and Saward (2002) skills are the abilities, innate or acquired, which enable someone to perform a task perfectly. Usen (2009) defined skill as the ability to use one's knowledge effectively and readily in an execution or performance of something competently. Therefore for small scale business enterprises to excel and survive competitions and stay in business in the society, they require skills in their daily operations. Government and non-governmental agencies have over the years been assisting small scale business enterprises with incentives such as capital, conducive business environment, subsidy on prices of goods as well as waiving taxes or economic development levies for certain period of time. Instead of floating and competing, they are folding up and fizzling away, perhaps as a result of lack of skills.

Time management skills are concerned with the abilities used in planning, coordinating and controlling the amount of time devoted for specific activities in an enterprises in order to enhance efficiency in business operation. Time management is also considered to the management of one's activities in an appropriate manner. Good time management means deciding on what an individual wants to achieve concerning a particular goal and how he should establish ways to attain his desires and objectives. Appropriate time management involves less stress and tension as well as increases recreation.

Credit management is not all about implementing and maintaining a set of policies and procedures to minimize the amount of capital tied up in debts. It is also about sourcing for credits, understanding the conditions attached to such credit and involving credit insurance where necessary. Adequate skills in credit management will aid the small scale business operators to really understand the basic types of credit components which includes service credit, loans, installment credit and grants. Samuelson (2001) stated that small scale business operators who do not possess adequate skills in credit management is bound to run their

enterprises in deficit and may incur debts accrued from loans or grants to the detriment of the business. Some credit facilities require collateral, without period of grace in their repayment programme and charges above single digit interest rate as regulated by Central Bank of Nigeria. A business operator who is vested with adequate skills in credit management will know the finance institution to go for credit facilities and may seek for credit insurance from a subsidiary firm of the credit house. Otherwise, accepting credits or giving out credits without proper skills in credit management may collapse any business operation within a short space of time. According to Usen (2009), credit insurance is an insurance designed to compensate creditor if a debtor who has been granted credit fails to pay. Adequate credit management also involves credit control to be able to coordinates activities of credits. French and Saward (2002) further assert that credit control is the activity of deciding whether an enterprise should grant credit to a customer and how much credit (that is for what amount of money and length of time) should be granted; ensuring that customers who have been granted credit are paying on time; and ascertaining if the conditions attached to the credit are serviceable or not. Most small scale business enterprise operators lack adequate knowledge of credit availability. Hence the need for skill improvement is necessary.

Mbroh and Attom (2011) conducted a study on methods of accounting practices by small business owners in Cape Coast Metropolitan area of Ghana. The population for the study was 250 small business owners. Due to the small number, the 250 small scale owners were used for the study. The findings of this study revealed that Small Business Owners (SBOs) who do not undertake formal training in accounting, kept personal notes of transactions to ascertain their total purchases and sales for a given period. Internal control system was neither understood nor practiced by 78% of the SBOs. Credit policies were also irregular.

Creditors were paid three weeks earlier than they were collecting from debtors in one month. Only 20 per cent of credit purchases had proper documentation and authorization. A good number did not differentiate between business and domestic payment. Only 7% made payment according to plan. 80% per cent of credit sales were offered to regular customers. Stock control was bad since stock registers and records were not kept, instead personal notes on stock movement were kept. However, stock-taking was undertaken by 81 % of small scale business owners while others did not bother. Wages were paid only in cash and no record was kept. Fixed asset registers were not kept by SBOs, however their acquisition documents were held and as a result external parties had used them in the preparation of balance sheet. Liabilities had no record apart from bank loan.

Okonkwo and Onwochei (2015) studied the relevance of small scale business in the economic development of Delta State, Nigeria. The nature of this research was correlational research and conducted using survey method, and sought to establish relationship among various variables of the research. The population comprised 164 business operators in Issele-Uku community of Delta State. In order to have representative samples, the researcher used the table of Kreejie. Based on the table Kneejie, if the population is approximately 160-170, then the sample size could be approximately 113-118. For this research, the sample was 118 small scale business enterprises in Delta State registered with Small and Medium Enterprises Development Agency of Nigeria (i.e 71.95% of the population). Questionnaire was the main tool of the research to collect data. Based on the data analyses, the findings showed that there was a significant relationship between small scale business enterprises skills and business operators' work morale at Issele-Uku community in Delta State.

Obi (2015) carried out a study on the role of small scale enterprises in the achievement of economic growth in Nigeria. The population was 1112 consisted of 908 business operators and 204 business consultants. Ex-post facto design was used to conduct the study, while stratified random sampling technique was used to select the sample size of 745 respondents for the study. Two researcher-developed instruments: Management Strategies Questionnaire (MSQ) and Business Operators Achievement Impact (BOA) were used for data collection and were validated by three experts in test and measurement. Also Cronbach alpha analytical method was used to ascertain the reliability of the instruments with reliability coefficient of 0.79 and 0.80, for MSQ and BOA respectfully. Simple regression analysis was used to test the hypotheses at 0.05 level of significance. Findings revealed that skills improvement and motivation relate to business operators' achievement. The conclusion was that, if business operators and small and medium enterprises development Agency of Nigeria must adopt suitable business strategies, skills needed would be tremendously improved. It was therefore recommended that adequate policy by Micro, Small and Medium Scale Enterprise Development Agency of Nigeria be used on Small Scale Business Enterprises to improve their productivity.

Usen (2015) worked on utilization of accounting information for investment decisions by small scale business enterprise operators in Akwa Ibom State. The study adopted descriptive survey design because it needed to gather the opinions of the respondents. The area of the study was Akwa Ibom State. The area was chosen because it has small scale business enterprise and business opportunities. Also it has stable and conducive environment with no stringent cultural norms. The population for the study comprises of 3310 small scale business enterprise operators from the three senatorial districts in Akwa Ibom State. The study also used 67 accounting experts members of Institute of Chartered Accountants of Nigeria (ICAN) to provide information on the strategies needed to improve the utilization of accounting information. Since the population was large the researcher used 10% resulting to 331 respondents. Stratified random sampling techniques was used for the study. The study had 398 respondents as sample size. The researcher developed 70 structured questionnaire items for the study which was divided into two parts. The first dealt with demographic characteristics, while the second part covered the research questions. It was recommended that accounting experts should always avail small scale business enterprises of their professional services. This study is therefore intended to examine the skills improvement needs of small scale business operators for economic growth in Akwa Ibom State.

# **Statement of the Problem**

Economic growth of Akwa Ibom State has been on a very slow space. The slow space of economic growth has been responsible to social stagnation and high national poverty level. The researcher had observed that most small and medium scale enterprises in Akwa Ibom State fold up and are liquidated almost on weekly basis. The reasons for inability of these enterprises to survive maybe due to lack of needed skills by business operators. It is envisaged that if this ugly trend is not controlled, more small and medium scale enterprises will be liquidated. This study therefore becomes apt as a means of determining the time management and credit management skills improvement needs of small scale operators for economic growth of Akwa Ibom State.

#### **Purpose of the Study**

The purpose of this study was to determine the skills improvement needs of small scale business operators for economic growth in Akwa Ibom State. Specifically, the study sought to:

- 1. Determine the time management skills improvement needs of small scale business for economic growth in Akwa Ibom State.
- 2. Determine the credit management skills improvement needs of small scale operators for economic growth in Akwa Ibom State.

#### **Research Questions**

- 1. What are the time management skills improvement needs of small scale operators for economic growth in Akwa Ibom State?
- 2. What are the credit management skills improvement needs of small scale operators for economic growth in Akwa Ibom State?

## Hypotheses

- 1. There is no significant difference between the mean responses of business educators and small scale business operators in the time management skills improvement needs for economic growth in Akwa Ibom State.
- 2. There is no significant difference between the mean responses of business educators and small scale business operators in the credit management skills improvement needs for economic growth in Akwa Ibom State

# Methodology

The study adopted descriptive survey design. The design employs the study of a small portion of the population to make inference on the entire population (Wali, 2006). The design is considered appropriate for this study since data on the skills improvement needs of small scale business operators was obtained from sample group using questionnaire as instrument for data collection. The population of this study was 2796 respondents made up of 96 Business Educators from University of Uyo and Akwa Ibom State College of Education, Afaha Nsit, and 2700 registered Small Scale Business Operators in Akwa Ibom State (Small and Medium Scale Enterprise Development Agency of Nigeria (SMEDAN), 2019).

The sample of the study was 400 respondents made up of 77 Business Educators and 323 Small Scale Business Operators in Akwa Ibom State. The sample size was selected using simple random sampling technique. The instrument used in gathering data was researcher-developed questionnaire captioned: Small Scale Business Operators Skills Improvement Questionnaire (SSBOIQ) for business educators and Small Scale Business operators. The same instrument was attended to by the two sets of respondents. The instrument contained 10 items; five for each of time management skills improvement needs and credit management improvement needs respectively. The research instrument was face validated by three experts, from Department of Business Education, University of Uyo, Uyo. The experts were requested to read the instrument, vet the items for clarity, relevance and suitability. The inputs and corrections from these experts were used in modifying the questionnaire items.

Internal consistency of the instrument was determined using Cronbach's alpha reliability technique, and a value of 0.89 was obtained. According to Olaitan and Nwoko (2004) Cronbach's alpha reliability technique gives a more accurate estimate of instrument reliability. Based on the high reliability coefficient the instrument were considered reliable and adopted for the study. The instrument was administered to the respondents and their responses later collated and used for analyses.

# Results

The results of the statistical analyses performed on the data collected are presented in Tables and arranged according to the relevant research questions and hypotheses of the study.

**Research Question 1:** What are the time management skills improvement needs of small scale business operators for economic growth in Akwa Ibom State?

# Table 1:Skill improvement gap analysis of mean responses of small scale business<br/>operators in time management n=400

S/N	Time Management Skills	$\overline{X}_{N}$	$\overline{X}_{\mathrm{P}}$	$\overline{X}_{N}$ - $\overline{X}_{P}$	Remarks
1.	Arrange periodic seminar on time management	3.36	2.24	1.12	IN
2	Publish time table manual for weekly events of the business.	3.46	2.17	1.29	IN
3	Estimate time for every business transaction	3.12	1.91	1.21	IN
4	Timely recoding of transaction	3.03	2.04	0.99	IN
5	Publishing time study	3.18	1.95	1.23	IN

# Key: IN = Improvement Needed

The data presented in Table 1 indicated that all the items on time management skills have their skill improvement gap to be positive (0.99-1.29). The result implies that small scale business operators in Akwa Ibom State need more training to enhance improvement in all the identified time management skills for economic growth.

**Research Question 2:** What are the credit management skills improvement needs of small scale business operators for economic growth in Akwa Ibom State?

# Table 2:Skill improvement gap analysis of mean responses of small scale business<br/>operators in credit management n=400

S/N	Credit Management Skills	$\overline{X}_{N}$	$\overline{X}_{\mathrm{P}}$	$\overline{X}_{ m N}$ - $\overline{X}_{ m P}$	Remarks
1	Ensure business operators are exposed to window of credits.	3.03	1.95	1.08	IN
2	Always be strict with credit recovery method.	3.15	1.82	1.33	IN
3	Ensure no credit agreement is entered without reading and interpreting the conditions to the end.	3.03	1.94	1.09	IN
4	Ensure there is an existing relationship before granting credit.	3.15	1.76	1.39	IN
5	Ensure credit conditions are met irrespective of the customer that is involved.	3.41	1.99	1.42	IN
	Cluster Mean	15.77	9.46	6.31	IN
<b>T</b> 7					

Key: IN = Improvement Needed.

The data presented in Table 2 indicated that all the items on credit management skills have their skill improvement gap to be positive (1.76-1.99). The result implies that small scale business operators in Akwa Ibom State need improvement in all the identified credit management skills for economic growth.

**Hypothesis 1:** There is no significant difference between the mean responses of Business Educators and small scale business operators in the time management skills improvement needs for economic growth in Akwa Ibom State.

# Table 3:t-test analysis on the difference between the mean responses of business<br/>educators and small scale business operators in time management skills<br/>improvement needs for economic growth in Akwa Ibom State

S/NO	Time Management Skills	Group	Ν	X	SD	P<.05	
	-	-					Decisions
1	Arrange periodic seminar on time	<b>Business Educators</b>	77	3.36	0.69	.004	S
	management	SSB Operators	323	2.24	0.76		
2	Publish time table manual for	<b>Business Educators</b>	77	3.46	0.53	.034	S
	weekly events of the business.	SSB Operators	323	2.17	0.80		
3	Estimate time for every business	<b>Business Educators</b>	77	3.12	0.46	.032	S
	transaction	SSB Operators	323	1.91	0.83		
4	Timely recoding of transaction	<b>Business Educators</b>	77	3.03	0.62	.000	S
		SSB Operators	323	2.04	0.81		
5	Publishing time study	<b>Business Educators</b>	77	3.18	0.51	.011	S
		SSB Operators	323	1.95	0.81		
S - Si	anificant $df = 308$ Sig@n < 05	Source: Field Wo	rl (20)	21)			

S = Significant, df = 398, Sig@p < .05 Source: Field Work (2021).

Table 3 gives the summary of the t-test analysis of the difference between the mean responses of Business Educators and small scale business operators in the time management skills improvement needs for economic growth in Akwa Ibom State. Since all the p-values are lower than the .05 alpha level, the null hypothesis which stated that there is no significant

difference between the mean responses of Business Educators and small scale business operators in the time management skills improvement needs for economic growth in Akwa Ibom State is rejected, implying that there is a significant difference between the mean of the respondents.

**Hypothesis 2:** There is no significant difference between the mean responses of Business Educators and small scale business operators in the credit management skills improvement needs for economic growth in Akwa Ibom State.

# Table 4:t-test analysis on the difference between the mean responses of business<br/>educators and small scale business operators in credit management skills<br/>improvement needs for economic growth in Akwa Ibom State

S/NO	Credit Management Skills	Group	Ν	$\overline{\mathbf{X}}$	SD	P<.05	Decisions
1	Ensure business operators are exposed to window of credits.	Business Educators SSB Operators	77 323	3.03 1.95	0.62 0.84	.002	S
2	Always be strict with credit recovery method.	Business Educators SSB Operators	77 323	3.15 1.82	0.41 0.84	.038	S
3	Ensure no credit agreement is entered without reading and interpreting the conditions to the end.	Business Educators SSB Operators	77 323	3.03 1.94	0.62 0.83	.006	S
4	Ensure there is an existing relationship before granting credit.	Business Educators SSB Operators	77 323	3.15 1.76	0.36 0.83	.002	S
5	Ensure credit conditions are met irrespective of the customer that is involved	Business Educators SSB Operators	77 323	3.41 1.99	0.53 0.82	.028	S

 $\overline{S} = Significant, df = 398, Sig@p<.05$  Source: Field Work (2021)

Table 4 gives the summary of the t-test analysis of the difference between the mean responses of Business Educators and small scale business operators in the credit management skills improvement needs for economic growth in Akwa Ibom State. Since all the p-values are lower than the .05 alpha level, the null hypothesis which stated that there is no significant difference between the mean responses of Business Educators and small scale business operators in the credit management skills improvement needs for economic growth in Akwa Ibom State is rejected, implying that there is a significant difference between the mean of the respondents.

# **Discussion of Findings**

The findings of this study revealed that there was significant difference between mean of responses of business educators and small scale business operators in both time management and credit management skills improvement needs for economic growth in Akwa Ibom State. This indicates that small scale business operators must acquire skills in time management, financial management, risk management and interpersonal relationship as a means of succeeding in business and contributing effectively to economic growth of the State. Such skills improvement by business operators is capable of enhancing sustainable economic

development (growth) through effective provision of goods and services. Thus, economic growth of Akwa Ibom State is directly dependent on acquisition of skills improvement needs by business operators. These findings are supported by studies such as Mbroh and Attom (2011) and Okonkwo and Onwochi (2015).

# Conclusion

It is concluded that small scale business operators in Akwa Ibom State possess low time management and credit management skills, which invariably resulted to unprogressive, stunt and folding out of business. This work has shown clearly that adequate skills in time management, and credit management and financial management are very essential to survival and growth small scale business enterprises. Thus, business operators should be trained and retrained to improve upon their skills.

# Recommendations

Based on the findings and conclusion reached, the following recommendations were made:

- 1. Small scale business enterprise operators should avail themselves of seminars and workshops to acquire the basic skills needed for driving to enable economic growth.
- 2. Potential small scale business operators should make effort to acquire the necessary qualification and experience for the intended business.
- 3. Akwa Ibom State Government in conjunction with Small and Medium Enterprises Development Agency of Nigeria and donor agencies should create programmes for the training and retraining of both business experts and business operators.
- 4. Government through Federal Ministry of Finance in conjunction with Central Bank of Nigeria should ensure that loan facilities are granted to small scale business enterprises at single digit interest rate.
- 5. That operators of businesses should subject themselves to government directives on registration, training and opportunities.

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THE PROTECTIVE EFFECT OF MEANING IN LIFE ON SUICIDAL TENDENCIES AMONG UNIVERSITY UNDERGRADUATES IN SOUTHERN NIGERIA

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## Abstract

Suicide cases among university students occasioned by the demands of the unique academic environment and other factors have generating concerns. This has led to increasing prevalence of suicide rates among adolescents and young adults, especially on university campuses. Therefore, this study investigated meaning in life as a protective factor against suicidal tendencies among university adolescents. It adopted a descriptive survey research design. The population of the study comprised students of University of Benin, Benin City and Federal University Oye-Ekiti, Nigeria. Multi-stage sampling technique was used to select 256 students as sample for the study. Meaning in life and suicidal tendencies questionnaire was used for data collection. Data collected were analyzed using Pearson moment product correlation and multiple regression. The findings of the study revealed that the presence of meaning in life among university undergraduates does not cause suicidal tendencies and that university undergraduates' search for meaning in life could cause suicidal tendencies. It was equally found that the presence of meaning in life and search for meaning of life, when pulled together have significant influence on suicidal tendencies. The study concludes that presence of meaning is a strong and protective strategy against suicide tendencies. Therefore it is important to create curriculum activities and a university environment that will strengthen university undergraduates' presence of meaning so as to weaken the causative effect of search for meaning in life.

Keywords: Meaning in Life, Adolescents, Suicide tendencies, University, Undergraduates

# Introduction

University undergraduates constitute a unique group of adolescents and young adults who consequent on developmental period, are transitioning from adolescence to adulthood, and seeking for means to adapt to campus life and its intriguing social and academic demands. They are also switching from parental cuddling to the university setting. This transition is

often accompanied by expectations, aspirations, hope and stress which may induce psychological maladjustment. With the realities of independence staring them in the face, some young adults could tirelessly seek answers and try to come to terms with such questions as what they are meant to do with their lives and education. Actually, this is not out of place because self-direction in terms of understanding one's goals and achieving directedness is a strong indication of maturity, which in some cases, significant others (guardians and parents) are proud of their children and wards for being purposeful in their chase for knowledge and fulfilment. But, in some situation, the inability to accomplish the pursuit for selfactualisation through set goals seems to demoralize the young people which sometimes may result in depression and suicide.

Suicide can be defined as a deliberate act of terminating one's own life. Bursztein and Apter (2009) described suicidal behaviours as heterogeneous and non-continuous sets of behaviours, which include ideation, attempts, threats and actual suicide, and which may or may not be connected to each other. Suicide is the third leading cause of death worldwide among those in the age group 15-24 years (Giru, 2016), which captures the age range of most university undergraduates. As such, suicidal behaviour among young adults which includes suicidal ideation, plans, and attempts is now recognised as an issue of public concern. Drum and Denmark (2012) reported that about 10% of undergraduate students in the United States replied positively to enquiries of whether they have been having thoughts of engaging in suicidal behaviour in the past 12 months. Suicidal ideations and attempts were estimated at 17% and 7.8%, respectively in a study that involved 500 adolescents from secondary schools in south-western Nigeria (Mapayi, Oginni & Osilaja, 2016).

Suicide involves different causal factors such as biological, psychological, psychosocial, and socio-cultural factors. Suicide among young people has been associated with various risk and protective factors. Empirical literature revealed that the risk factors for suicide that are especially pertinent to the college student population include poor parent-child relationships; academic difficulties; low social support and depression (Arria, O'Grady, Caldeira, Vincent, Wilcox, & Wish, 2009); low life purpose and meaning of life, previous attempt(s) (Drum, Brownson, Denmark, & Smith, 2009), academic hardiness (Olaseni, 2018), hopelessness (Schwartz & Friedman, 2009); physical and/or sexual abuse (Martino, 2011); and anxiety (Hill, Castellanos & Pettit, 2011). Lew, Huen, Yu, Yuan, Wang, Ping, Talib, Lester, & Jia (2019) found that the students' major risk factors for suicide were depression, anxiety, stress, and hopelessness; and the students' minor risk factors included orientation to happiness and coping styles (including self-distraction, self-blame and substance use).

However, the concern of this paper centers on protective factors. Protective factors can be defined as societal or psychosocial conditions or individual behaviours that lessen the likelihood that an individual will engage in suicidal behaviour (Scottish Government Social Research, 2008). It is important to identify risk factors, but most importantly, protective factors relevant to university undergraduates in order to develop effective solutions and counselling interventions for suicide prevention. The researchers therefore identified meaning in life as possible protective factor. Lew, Huen, & Yu et al (2019) found that the presence of meaning in life had a positive effect on preventing suicide and acted as a protective factor. Costanza, Prelati and Pompili (2019) found that Meaning in life emerged as a protective factor against suicidal ideation (SI), suicidal attempts (SA) and completed suicides, directly or through mediation/moderation models with other suicidal behaviour related variables.

Lew, Chistopolskaya, Osman, Huen, Talib and Leung (2020) found that meaning in life, including both the presence of meaning in life and search for meaning, can be good protective factors against suicidal behaviours.

Often times, adolescents are occupied with the attempts and efforts to find meaning in their lives and consequently, they are often questioning and exploring their desires, purposes, and motivation in the pursuit of life (Kiang & Fuligni, 2010). Actually, this effort of finding meaning is not out of place. The urge to find meaning in life is a primary motivating force for any individual. Frankl (1969) suggested that we have the free will to search for meaning in our lives, even when we are facing inevitable suffering. He stated further that meaning is a thing to be found rather than to be given and through discovery rather than invention. Therefore, this implies that no situation should subject one to suicide as an option, one can find meaning if one wishes. In other words, one has the responsibility of positively creating and making meaning of any scenario. The most widely used self-report instrument to measure the meaning in life is the "Meaning in Life Ouestionnaire (MLO)" which is composed of two subscales, namely; "Search for Meaning (MLQ-S)"; and "Presence of Meaning (MLQ-P)". While the construct of presence of meaning refers to the actual experience of meaning in life, the construct of search for meaning captures the process of looking for and acquiring the meaning in life. In addition, presence of meaning refers to the degree to which an individual finds his or her life to be meaningful, whereas search for meaning refers to an active exploration into finding a sense of meaning (Lew & Chistopolskaya, et al, 2020).

# **Statement of the Problem**

The experience during adulthood is similar to university events which are marked by relatively and completely new and different encounters and feelings. At this point, young adults are stared in the face by difficult questions as they try to survive, thrive, make meaning of who they are and what they are likely to do with their lives. Most young adults try to provide meaningful answers to the daily questions and difficulties. They have to adapt to new stressful experiences, such as being away from home, which calls for coping skills (Eskin, Sun, Abuidhail, Yoshimasu, Kujan, Janghorbani, Flood (2016). Unfortunately, some individuals, including university adolescents, see death by suicide as a viable solution to these undeniable, challenging and stressful life issues (Lew et al., 2020). The substantial increase in rates of suicide worldwide, especially among late adolescents and young adult is worrisome and notable.

Several suicide cases have been recorded among undergraduates in Nigeria's educational institutions, especially in the universities. The prevalence of suicide rates among adolescents and young adults, especially on university campuses, have been increasing at an alarming rate (Nwafor, Akhiwu & Igbe, 2013; Mapayi, Oginni & Osilaja, 2016; Lee, Lee, & Kim, 2017; Akanni, Fela-Thomas, Ehimigbai & Aina, 2017). Most universities lack records of such suicide incidences, yet they do happen. Similarly, there is dearth of studies conducted in the area of causative factors of suicide in such universities. Therefore, it is important to identify specific protective factors for suicide-related behaviors among undergraduate adolescents and young adults, so as to help them prevent suicide. Therefore, this study examines the meaning in life as a protecting strategy against suicide tendencies among university undergraduates.

## **Research Questions**

- 1. What is the relationship between presence of meaning and suicidal tendencies among university adolescents?
- 2. What is the relationship between search for meaning and suicidal tendencies among university adolescents?
- 3. To what extent do presence of meaning in life and search for meaning in life influence suicidal tendencies among University adolescents?

## Methodology

The study adopted a survey, using descriptive method since it is aimed at collecting data on meaning in life as a protective factor against suicide behaviours among university undergraduates. The population for this study comprised university undergraduates of two Federal Universities in Southern Nigeria, viz: University of Benin, Benin City and Federal University Oye-Ekiti, Nigeria. Multi-stage sampling technique was used to select 256 students. Firstly, four faculties were randomly selected from the two universities. Secondly, simple random sampling procedure was used to select two hundred and fifty-six (256) respondents from. This sample served as respondents for the survey. In order to elicit information from the respondents, the researcher adapted a self-structured 15-item questionnaire from the work of Mba (2010) to measure suicidal tendencies and Frankl (1969) Meaning in Life Questionnaire (MLQ) to measure attitudes and satisfaction toward life. It was made up of three 5-item subscale: the presence of meaning in life (MLQ-P, "I understand my life's meaning"); a search for meaning in life (MLQ-S, "I am seeking for a purpose or mission for my life") and suicide tendencies (I attempted killing myself when I felt life was hopeless). All the 15 items are rated from 1 (absolutely untrue) to 3 (absolutely true). The reliability coefficient (R= 0.70) for presence of, search for meaning in life and suicidal tendencies was established using Cronbach Alpha. The data collected were analysed using regression analysis and Pearson product moment correlation.

# Results

**Research Question 1:** What is the relationship between presence of meaning and suicidal tendencies University adolescents?

Variables	Mean	Standard Deviation	Search for Meaning in Life	r	Sig.
Presence of Meaning	8.43	2.572	.439 <sup>**</sup> .000	166**	.008
Suicidal Tendencies	17.87	3.621			

# Table 1: Relationship between presence of meaning and suicidal tendencies

Table 1 shows the relationship between presence of meaning in life, search for meaning in life and suicidal tendencies among undergraduate students. There exist a positive significant relationship between presence of meaning in life and searching for meaning in life(r = 0.439, p < 0.05); this means that high levels of presence of meaning in life in undergraduate students leads to high levels of search for meaning in life. In other words, the search for meaning in life (MLQ-S) was positively related to the presence of meaning in life (MLQ-P).

**Research Question 2:** What is there the relationship between search for meaning and suicidal tendencies among University adolescents'?

Variables	Mean	Standard Deviation	Presence of Meaning in Life	r	Sig.
Search for Meaning	11.36	3.010	.439 <sup>**</sup> .000	.177**	.004
Suicidal Tendencies	17.87	3.621			
*Significant at	0.05 Alpha	level			

## Table 2: Relationship between search for meaning and suicidal tendencies

Table 2 revealed that search for meaning in life has a positive relationship with suicidal tendencies, but statistically significant (r = .177, p < .004). This means that University adolescents' search for meaning in life causes suicidal tendencies.

**Research Question 3:** To what extent do presence of meaning in life and search for meaning in life influence suicidal tendencies among University adolescents?

# Table 3:Composite contribution (influence) of presence of meaning in life and search<br/>for meaning in life on suicidal tendencies

	Sum of Squares	Df	Mean Square	F	Sig.	
Regression	353.145	2	176.572	14.932	.000	
Residual	3003.618	254	11.825			
Total	3356.763	256				
R = 0.324 R Square = 0.105	Adjusted R Square = 0.098 Std_Error of the Estimate =					

Table 3 reveals that presence of meaning in life and search for meaning in life, when pulled together have significant influence on suicidal tendencies. The result yielded a coefficient of multiple regression R = 0.324, multiple  $R^2 = 0.105$  and adjusted  $R^2 = 0.098$ . This suggests that individuals' presence of meaning in life and search for meaning in life jointly accounted for 10.5% in the variation of suicidal tendencies. Other variables accounting for the

remaining percentages are beyond the scope of this study. The ANOVA result from the regression analysis shows that there was a significant joint effect of the independent variables on suicidal tendencies,  $F_{(2, 256)} = 14.932$ , p < 0.05.

## **Discussion of Findings**

Table 1 shows the relationship between presence of meaning in life, search for meaning in life and suicidal tendencies among undergraduate students. There exist a positive significant relationship between presence of meaning in life and searching for meaning in life (r = 0.439, p < 0.05); this means that high levels of presence of meaning in life in undergraduate students leads to high levels of search for meaning in life. Thus, the search for meaning in life (MLQ-S) was positively related to the presence of meaning in life (MLQ-P), which is consistent with the findings of other studies in China and Japan (Chan, 2014).

Secondly, the table also showed that presence of meaning in life has a negative relationship with university adolescents' suicidal tendencies, but is statistically significant (r =-.166, p < p0.008). This implies that presence of meaning in life among University adolescents does not cause suicidal tendencies. A clear sense of purpose and satisfying life purpose are characteristics of presence of meaning. Thus, the outcome of this may be explained by the fact that the presence of sense of purpose and satisfying life purpose shields the adolescents from the feeling of depression which may bring up suicidal thoughts. This is corroborated by that of Lew, and Chistopolskaya, et al (2020) found that the presence of meaning was relates negatively with suicidal orientation and suicidal behaviours; and that of Beaver and Kleiman (2013) who found that presence of meaning in life predicted decreased suicidal ideation overtime and lower lifetime odds of suicide attempts. Similarly, Lew, Huen, & Yu et al (2019) established that the presence of meaning in life had a positive effect on preventing suicide and acted as a protective factor among Chinese University students. In addition, it correlates with the finding of Blazek, Kazmierczak and Besta (2015) which established that the ability to maintain the feeling of sense of one's existence seems to be a significant factor that protects from decrease in life quality and keeps the feeling of being able to deal in difficult situations as well as depression systems-which are responsible for suicide thoughts..

The result presented in Table 2with respect to second research question revealed that search for meaning in life has a positive relationship with suicidal tendencies, but statistically significant (r = .177, p < .004), this means that University adolescents' search for meaning in life increases suicidal tendencies. In other words, as university adolescents' search for meaning increases, their suicidal tendencies increase. This may be explained by the fact that the stage of adolescence is laden with inquisitiveness, role identity and confusion, as they are trying to find their feet among adults. They are often exploring, questioning and trying to find fulfilments to their purposes, their passions and motivation in life. When they seem to fall short of realizing all those, feelings of emptiness and worthlessness may crawl into their psyche, thereby leading to suicidal thoughts. The finding of this study is supported by that of Lew, and Chistopolskaya, et al (2020) which found that Search for Meaning (MLQ-S) was negatively correlated with suicidal orientation and behaviours; and that of Beaver and Kleiman (2013) which found that search for meaning in life predicted decreased suicidal ideation overtime.

With respect to research question three, the result in Table 3 answered the questions raised by establishing the joint influence of presence of and search for meaning in life on suicidal tendencies among university adolescents. This is supported by the findings of Lew, Chistopolskaya, Osman, Huen, Talib and Leung (2020) which revealed that meaning in life, including both the presence of meaning and search for meaning, can be good protective factors against suicidal behaviours. Costanza, Prelati and Pompili (2019) found that meaning in life emerged as a protective factor against suicidal ideation (SI), suicidal attempts (SA and completed suicides, directly or through mediation/moderation models with other SB-related variables.

# Conclusion

The study concluded that having satisfying life purpose and sense of what makes life meaningful protects university undergraduates from suicidal tendencies, since presence of meaning in life does not cause suicidal tendencies. Therefore, presence of meaning is a positive and protecting strategy against suicide tendencies. In addition, searching for meaning in life cause suicidal tendencies among university adolescents.

## Recommendations

In this study, presence of meaning in life was found not to cause suicide but search for meaning in life causes suicide, therefore the following recommendations are made:

- 1. Civil organizations should create activities such as workshop, seminar, projects and environment that will strengthen university undergraduates' presence of meaning so as to weaken the causative effect of search for meaning in life and stem the tides od suicide.
- 2. Counselling stakeholders should ensure the availability of timely support services on the campus that will promote and foster the realization of presence of meaning in life. This will empower them to have a sense of purpose and satisfying life purpose.
- 3. All stakeholders in tertiary institution should initiate and sustain structures and platforms that will fortify the determination and motivation of adolescents to be creative in searching for meaning in life without hurting themselves or opting for suicide out of inability to find purpose.
- 4. School authorities should create a platform through designed activities to help the undergraduate student stir up their gifts so as to realize their potential in order to contribute meaningfully to the society. This will boost their sense of belonging and reduce suicide tendencies.
- 5. Counsellors should intensify efforts in assisting students in set goal and put up plans on how to fight underlying issues that may be threatening their sense of meaningfulness and worth so as to reduce negative thoughts that are suicidal which may jeopardize their future and existence.

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# COMPARATIVE EFFECTS OF DEMONSTRATION AND GUIDED-DISCOVERY TEACHING METHODS ON ACADEMIC ACHIEVEMENT AND RETENTION OF STUDENTS ON THE CONCEPT OF PROJECTILE MOTION IN PHYSICS

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## Abstract

This study investigated the comparative effects of demonstration and guided-discovery teaching methods on academic achievement and retention of students in the concept of projectile motion in physics. It was a quasi experimental research using non-randomized pretest post-test control group with guided-discovery method as control. Two research questions and two hypotheses were formulated to be answered and tested respectively. A sample size of 122 senior secondary two (SS II) physics students drawn using simple random sampling technique was used for the study. Researchers'-made instrument tagged "Achievement Test on Projectile Motion" (ATOP) with reliability of 0.75 determined using a test-retest method was used in collecting relevant data. The data obtained were analyzed using mean, standard deviation and analysis of covariance (ANCOVA). All hypotheses were tested at .05 level of significance. The results showed a significant difference in the mean achievement and retention by the students. Students taught using demonstration method performed significantly better than those taught with guided discovery method, while students taught using demonstration method retained significantly better than those taught using guided discovery method. Consequently, it was recommended that demonstration method (a studentcentered method) should be adopted in teaching the concept of projectile motion in physics.

**Keywords:** Demonstration Method, Guided-Discovery Method, Achievement, Retention, Projectile Motion

# Introduction

The development of every society is totally dependent on the scientific advancement of the society. Science is the bedrock for economic development and technological advancement of any nation. Development in science has brought about alteration in the way people live, relate, communicate and carry out transaction, with profound effect on economic development (Murry, 2012). To promote technological advancement, developing countries

(like Nigeria) should invest in qualitative education for the youths and continuous skills training for workers and managers (leaders) (Lindberg, 2007).

Science is the product of the mind, seeking to discover and review the natural laws that govern the universe. Science can be seen or defined as a systematic enterprise that builds and organizes knowledge in the form of testable explanations and predictions about the universe (Murry, 2012). It can also be seen as the way of finding the practical ways of using scientific discoveries or turning scientific knowledge into use (Na'allah, 2016). Science is a great enterprise which nations depend on in order to advance technologically; it is therefore receiving much emphasis in education because of its significance and relevance to the society (Irvin, 2011). It is a collective institution aimed at providing information and an accurate explanation of how the natural world got to the way it is now. The main goal of science has been to build knowledge and understanding regardless of its potential application (Murry, 2012). Looking at its immense contributions to the development and advancement of the universe, it has been recognized as the bedrock upon which modern day technological breakthrough hangs (Najimudeen, 2016).

Nowadays countries all over the world, especially the developing ones which includes Nigeria are striving hard to develop technologically and scientifically. The widening economic gap between nations is linked more to the corresponding gap in science and technology. For developing countries like Nigeria to advance or grow above a certain level in development and economic advancement, they must give attention to science and technological development (Mandarin and Preckel, 2009).

Physics is a branch of science that deals with the physical nature and properties of matter and energy. It has to do with the structure of matter and interaction between the fundamental constituents of the observable universe. As one of the most fundamental scientific discipline upon which other science subjects depend on, its main goal is to understand how the universe behaves. In all spheres of human endeavors, the subject plays a very vital role; it is indispensable in the fields of engineering, medicine, agriculture, petrochemical industries, and geology and even in the mining industries (Egbule, 2014). Because of the indispensability of physics, much emphasis has been placed on the instruction of the subject especially in the secondary school level which form the foundation to any advance educational sciences. This is to ensure full actualization of the principles, theories and objectives of physics education as stipulated in the National policy of education. The study of physics in secondary schools can equip students with useful concepts, theories and principles that will enable them face the challenges before and after graduation since the subjects is artistically and vocationally inclined (Ibe, 2012).

In view of the obvious importance of physics in scientific and technological advancement of every nation, the observed consistent poor performance of students in physics at secondary school level has been a source of concern to parents, government, school authorities and examination bodies, at various times (Ogunneye, 2012). West African Examinations Council's Chief Examiners Report 2008 showed that for three years period 2004, 2005, and 2006, about 30% of the physics candidates had credits in their results, indicating poor performance in the three years period. This was traceable to poor quality of education in the secondary school level as a result of factors like poor funding, infrastructure, negligent and wrong choice of teaching methods and so on. According to Ogunneye (2012) and Omirhiren (2012) a lot of factors have contributed to the student's poor performance in

science in secondary schools. Even with the efforts by professional bodies like Science Teachers Association of Nigeria (STAN) and Institute of Physics (IOP) to improve the standard of teaching in physics, some teachers and students still find it difficult to master some of the concepts in physics in the national science core curriculum (Mkpanang & Sam, 2021). From the 2017 Annual Report given by the West African Senior School Certificate Examination Council, it was also noted that the poor performance of students in physics could primarily be caused by poor teaching method adopted by Physics teachers. Ojijeogu (2017) observed that students mostly avoid questions drawn from the core concepts in physics like projectile motion as a result of inability to understand the concept when taught in classroom. Ojijeogu opined that learning should be done with the most suitable student-centered teaching methods in order to enhance effective performance among students.

Demonstration method is a teaching strategy which involves practical and experimentation. The basic method of instruction for teaching skill-type subject matter is the demonstration method of instruction in which Obeka (2010) opined that this method is recommended for teaching skills because it covers all the necessary steps in an effective learning order. According to Obeka, the demonstration steps give learners the opportunity to see and hear the details related to the skill or subject being taught. Those details include the necessary background knowledge, the steps or procedures, principles and the safety precautions. Demonstration may be defined as display of an event or process. It involves the teacher or the student showing activities in front of a class and explaining it as he proceeds (Uche & Umoren, 1998). Though demonstration activities are often defined to embrace laboratory experiments and practical, however, there is a distinction between the two practices. The mode of communication prevalent in demonstration strategy is a two-way communication in which the teacher communicates with the students and the students also communicate with the teacher.

In this method, the teacher encourages maximal participation from students. Demonstration is essentially a teacher activity aimed at showing how a skill, procedure or a process works is done. The purpose is to ask students to acquire the requisite skills or to procure related knowledge. In the discipline of science, demonstration has a long history of usage and it basically entails showing how certain scientific equipment operates or a certain operation in science serves to explain a given concept. In the class room, demonstration may be subjected to uses including to pose a problem that requires a solution or to illustrate a problem in order to ensure a quick arrival at the solution. Similarly, a demonstration may be applied to process or to follow a discussion, or it may be used to illustrate the application of a principle. As a rule, demonstration is jointly used with other skills such as explanation and discussion. It can therefore be considered as a valuable instructional method as it significantly serves to improve student's learning.

Research have proffer a philosophy underlying the use of classroom demonstrations; that because demonstrations are entertaining, they will spark deeper interest in the current topic and prompt students to further study the subject. Many published articles relating to demonstrations take up this theme, for example, Mayer (2003) stated that, educators can generate and review vital interest in learning through the use of well planned and effectively presented classroom demonstrations that attract and engage the active and visual learners in today's classrooms'. Some of the important guidance for a successful demonstration includes: planning all the activities relating to demonstration in great details, ensuring that all the equipments, illustrations and other relevant materials are procured in time and kept ready

before the demonstration begins, breaking down the demonstration into suitable steps so that can be easily understood by the students, proceeding with the demonstration slowly so that all the students may grasp the details and get involved in the activities, ascertaining the students understanding of every stage of the lesson, giving suitable and useful verbal explanations for clarity on students interest areas and doing an assignment based on the demonstration.

Amodu and Haruna (2018) observed in a study carried out on the effect of demonstration and lecture teaching methods on academic performance of secondary school students in Financial Accounting in Adamawa State, Nigeria, that demonstration method had significant effect on students' performance than lecture method. In another study carried out by Paul and Dantani (2012) on the effects of lecture and demonstration methods on the Academic Achievement of Students in Chemistry in Nassarawa Local Government Area of Kano State, the result showed that students recorded high academic achievement in chemistry when taught with demonstration method.

Guided-discovery means careful planning, close supervision, ongoing assessment and targeted intervention by a teacher or an instructional team of teachers through the inquiry process that gradually leads students toward independent learning (Crede and Kuncel 2008). Its ultimate goal is to develop independent learners who know how to expand their knowledge and expertise through skillful use of a variety of information sources employed both inside and outside of the school. Guided discovery requires students to find out things for themselves, and this cannot be done where the teaching method is lecture oriented.

The value of discovery has been the subject of debate and some disagreements among educational psychologists. As explained by Mayer (2003), guided-discovery was the best method (of those used) to promote the learning of certain scientific rules. Mayer (2003) argued that guided discovery only looked better because of what it had been compared with, usually-rote learning. He went further to claim that there was just no evidence that discovery of any kind was a more effective teaching method than meaningful exposition. Clute (2011), agree that guided discovery is important in promoting learning with young children, while Ausubel (1963) on the other hand agreed that active learning methods are more important for younger students than for elder ones. Yet guided-discovery is quite popular and suitable with some teachers. They believed that the students are better motivated by an active approach and perhaps by a challenge, but the teacher may justifiably step in at any time to ensure that the desired end point is reached.

A number of studies have been carried out on the effect of guided discovery method on students' academic performance in selected secondary schools. In the study carried out by Omirhiren (2012) on the effect of guided-discovery and traditional methods on the achievement of students in senior secondary school chemistry in Cross River State. It was found out that guided discovery method was more effective in enhancing the achievement of students in Chemistry than the traditional method. In another study conducted by Akanmu and Fajemidagba (2013) on guided-discovery learning strategy and senior secondary school students' performance in mathematics in Ejigbo, the result of the study revealed a significant difference in favour of those exposed to guided-discovery learning strategy compared to those exposed to traditional method. Effiong (2010) also carried out a study on the effects of guided discovery; student demonstration and expository instructional strategies on students performance in chemistry and discovered that students taught with guided-discovery method had the best performance. However, because of the importance of physics to science advancement. This study is aimed at investigating the comparative effects of demonstration and guided-discovery methods in physics (and unexplored subject area). This study intends

to compare the effects of demonstration and guided-discovery methods on academic achievement and retention of students on the concept of projectile motion in Physics?

# **Statement of Problem**

In spite of a great emphasis on science teaching and learning all over the world and Nigeria in particular, it is observed that students still record a poor performance in majority of the physics concepts especially projectile motion, simply because they lack an understanding of the concept. According to WAEC Chief Examiner's reports, it was observed that most students avoid attempting and answering questions on the concept of projectile motion in external examinations. This attitude by the students is traced to lack of understanding of the concept due to teacher's inability to adopt a suitable teaching method in their lessons. The teaching strategies/methods so far adopted, not only hinders students understanding of the concept or subject matter at hand, but it also negatively affect the response of students in their interest and motivation to learn. Thus, students' poor performance can be attributed to the teachers' failure to adopt/use an effective and suitable teaching method. Demonstration method which encourages maximum participation of students is hereby suggested. It is on that basis that the researchers asked the pertinent question: What is the comparative effects of demonstration and guided-discovery methods on the academic achievement and retention of students in projectile motion in Physics?

# **Purpose of the Study**

The purpose of the study was to examine the comparative effects of demonstration and guided-discovery methods on academic achievement and retention of students in the concept of projectile motion in Physics. Specifically, the objectives of the study are as follows; to:

- 1. compare the academic achievement of students in the concept of projectile motion in Physics when taught using demonstration and guided-discovery methods.
- 2. compare the academic retention of students in the concept of projectile motion in Physics when taught using demonstration and guided-discovery methods.

# **Research Questions**

The following research questions were raised to guide the study.

- 1. What is the difference in the mean academic achievement scores of students in the concept of projectile motion in Physics when taught using demonstration and guided-discovery methods?
- 2. What is the difference in the mean academic retention scores of students in the concept of projectile motion in Physics when taught using demonstration and guided-discovery methods?
# Hypotheses

The following null hypotheses were formulated to guide the study.

- 1. There is no significant difference in the mean academic achievement scores of students in the concept of projectile motion in Physics when taught using demonstration and guided-discovery methods.
- 2. There is no significant difference in the mean retention scores of students in the concept of projectile motion in Physics when taught using demonstration and guided-discovery methods.

### Methodology

The design adopted for the study was a quasi-experimental design using a non-randomized pre-test and post-test control group. Group 1 was taught using demonstration while group 2 taught with guided discovery method. Structurally, the design is illustrated thus:

$E_1$	$O_1$	$X_1$	$O_2$	$O_3$ (Group 1)
$E_2$	$O_4$	$X_2$	$O_5$	$O_6$ (Group 2)

where:

E <sub>1</sub>	represents experimental group 1
$E_2$	represents experimental group 2
$O_1, O_4$	represents pretest observations for groups 1 and 2 respectively
O <sub>2</sub> , O <sub>5</sub>	represent post-test observations for groups 1 and 2 respectively
$O_{3}, O_{6}$	represents retention observations for groups 1 and 2 respectively
$X_1$	represents treatment for group 1
$X_2$	represents treatment for group 2

The study was conducted in public secondary schools in Itu Local Government Area, Akwa Ibom State. The population of the study comprised of all the 296 senior secondary two (SS II) Physics students in all the nine public coeducational secondary schools in Itu Local Government Area, Akwa Ibom state. (Local Education Committee, Itu, 2019).

The study sample comprised of 122 Physics students from the two participating schools that were randomly selected from among the schools in the study area. Intact classes in the two schools were chosen randomly and further assigned to experimental groups 1 and 2 randomly.

The instrument for the study was a 20-item Achievement Test on Projectile Motion abbreviated ATOP. The items were multiple choice objective questions with options lettered A-D, of which only one was correct. The instrument was face and content validated by three experts; two experienced Physics teachers and one specialist in test and measurement, all from the Faculty of Education, University of Uyo. To ascertain the reliability of the instrument, the 20 multiple choice test items was administered twice using test-retest method to a trial group which was not selected for the study but within the study population. The

result gave a reliability co-efficient of 0.75 using Pearson product moment correlation (PPMC) formula. Each correct option in the instrument was scored 1 mark, while an incorrect option was scored zero (0), giving a minimum score of zero (0) and a maximum score of 20 marks.

The researcher visited the selected schools in the study area and obtained permission from the school administrators to use the facilities and students for the study. The subject teachers of the selected schools were trained to assist the researcher; the teachers were trained on how to use the lesson packages for teaching the groups, effective classroom management and time management. Also for the purpose of the research, the teachers were trained on the technique involved in administration of the Achievement Test on Projectile Motion (ATOP).

After the training, the research assistants administered a pretest using ATOP to the two groups selected for the study. Immediately after the pretest, the experimental groups were taught the concept of projectile motion by the research assistants. Students in the experimental group 1 was taught using demonstration method; the teacher assess students entry behavior by asking the students to define the term motion, thereafter the teacher introduced the concept of projectile motion to students by giving classroom explanation through demonstration, stating the various variables under the concept of projectile motion. The teacher went as far as illustrating how to measure the variable like range (R), maximum height (H), projectile angle, time of flight (T), and time to reach the maximum height (t) and other related sub concepts. In experimental group 2, students were taught the concept of motion using guided-discovery strategy. The strategy centred on the students while the research assistants played a guiding role during the lessons. The suitable instructional materials were made available for the students to manipulate as they work towards understanding the sub-content elements in projectile motion. The students after having the theoretical knowledge of the concept, measured the range, time of flight, angle of projection, maximum height as well as the time taken for the projected body to reach the maximum height as guided by the research assistants. All measurements taken by the students were duly assessed and certified to be correct by the research assistants. Immediately after the lessons to the two experimental groups, a post-test was administered to both groups by the research assistants under examination conditions. Three weeks after, a delayed post-test or retention test was administered to both groups. All the scripts were marked and scores collated and used for analysis.

The data obtained were analyzed accordingly with mean, standard deviation and analysis of covariance using pretest as covariate. All hypotheses were tested at 0.05 level of significance.

#### Results

**Research Question 1:** What is the difference in the mean academic achievement scores of students in the concept of projectile motion in physics when taught using demonstration and guided-discovery methods?

		Pre	test	Post	-test	
Group	N	$\overline{\mathbf{X}}$	SD	X	SD	Mean Gain
E <sub>1</sub>	65	6.65	2.09	15.72	2.18	9.07
E <sub>2</sub>	57	6.74	2.35	13.07	3.26	6.33

Table 1:	Means and stand	lard deviation	s of	students'	pretest	and	post	test	scores	taught
	projectile motion	using demonst	ratio	n and guid	led-disco	very	strate	egies		_

N =Number of students, X = Mean; SD = Standard Deviation

As presented in Table 1, the mean achievement scores of students' pretest and post test on the concept of projectile motion in physics taught using demonstration method are 6.65 and 15.72 respectively while the corresponding figures for students taught motion using guided-discovery method are 6.74 and 13.07 respectively. The mean gain in the achievement scores of students taught using demonstration method is 9.07 while those taught using guided-discovery method is 6.33. From the result, it is inferred that the mean achievement scores of those taught with demonstration method is higher compared to those taught with guided-discovery method.

**Hypothesis 1:** There is no significant difference in the mean academic achievement scores of students in the concept of projectile motion in physics when taught using demonstration and guided-discovery methods.

# Table 2: Analysis of covariance of students post test scores based on strategies using pretest scores as covariate

Source	SS	df	MS	F-cal.	P-value	Decision
Pretest	.002	Ι	.002	.000	.000	*Sig.
Strategy	213.648	1	213.648	28.289	.000* <sup>s</sup>	
Residual	898.733	119	7.552			
Total	1112.467	121				

 $*^{s}$  = Significant at .05 level of significance

As shown in Table 2, the obtained P-value of .000 is less than the alpha level of .05 for the strategy. This requires the rejection of the null hypothesis, thus there exists significant difference in the mean achievement scores of Physics students taught projectile motion using demonstration and guided discovery strategies.

**Research Question 2:** What is the difference in the mean retention scores of students in Physics when taught the concept of projectile motion using demonstration and guided discovery methods?

		Pre	test	Reter	ntion	
Group	Ν	$\overline{\mathbf{X}}$	SD	$\overline{\mathbf{X}}$	SD	Mean Gain
$E_1$	65	6.66	2.09	12.74	2.28	6.08
$E_2$	57	6.74	2.35	11.49	3.40	4.75

# Table 3:Means and standard deviations of students' pretest and retention scores taught<br/>projectile motion using demonstration and guided-discovery methods

N =Number of students X = Mean; SD = Standard Deviation

As presented in Table 3, the mean pretest and retention scores of students on the concept of projectile motion in physics, when taught using demonstration method are 6.66 and 12.74 respectively while the corresponding figures for students taught projectile motion using guided discovery method are 6.74 and 11.49 respectively. The mean gain in the retention scores of students taught using demonstration is 6.08 while those taught using guided discovery method is 4.75. From the result, it is inferred that the mean retention scores of students taught with demonstration is higher compared to those taught with guided discovery method.

**Hypothesis 2:** There is no significant difference in the mean retention scores of students in Physics when taught the concept of projectile motion using demonstration and guided discovery methods.

					-	
Source	SS	Df	MS	F-cal.	P-value	Decision
Pretest	5.220	1	5.220	.642	.425	*Sig.
Strategy	46.692	1	46.692	5.742	·018 <sup>*s</sup>	
Residual	967.579	119	8.131			
Total	1020.04	121				
* <sup>s</sup> = Significan	t at .05 level of sig	nificance				

# Table 4: Analysis of covariance of students retention test scores based on strategies using pretest scores as covariate

As shown in Table 4, the obtained p-value of .018 is less than the alpha level of .05 for the strategy. Therefore, the null hypothesis is rejected, giving the alternate hypothesis that there exist significant difference in the mean retention scores of Physics students taught projectile motion using demonstration and guided discovery strategies.

### **Discussion of Findings**

This study investigated the comparative effects of demonstration and guided-discovery methods on students' performance in the concept of projectile motion in Physics. Analysis on Table 1 shows that the mean gain of student's achievement in experimental group 1 (demonstration) was higher than that of experimental group 2 (guided-discovery). This indicates that student scored higher in physics when taught with demonstration method than when taught with guided discovery. Also the result of the hypothesis test in Table 2 showed a rejection of the null hypothesis 1 because the obtained p-value of .000 was less than the alpha level of .05, which indicated a significant difference in the mean academic achievement of students in physics between the two groups. Thus, students in experimental group 1 had higher achievement scores compared to their counterparts in the experimental group 2. This result may be as a result of the demonstration method giving the students the opportunity to see, hear and engage in the details of the concept as taught. This result is in agreement with Amodu and Haruna (2018), Paul and Dantani (2012) that concluded that demonstration method can lead to improvement in the academic achievement of students taught with it.

Analysis on Table 3 revealed that the mean gain of students' retention scores in experimental group 1 (demonstration) was higher than that of experimental group 2 (guided-discovery). This indicates that students in experimental group 1 (demonstration) retained better than those in experimental group 2 (guided-discovery). Also the result of the hypothesis testing on Table 4 showed a rejection of the null hypothesis one because the obtained p-value of .018 was less than the alpha level of .05, which indicated a significant difference in the mean retention scores of students in physics between the two groups. Hence the students taught with demonstration have higher ability to retain materials than those taught with guided-discovery method. The reason for this result maybe that the steps employed in the demonstration had led to students' grasp of the lesson and consequently, their involvement in activities relevant to the learning of projectile motion. The result is in opposition to Akanmu and Fajemidagba (2013) findings which stated that guided-discovery method, as such student retention ability is traceable to the teaching method that enhances their performance, which in this case is the demonstration method.

### Conclusion

From the findings of this study, it is concluded that demonstration method is most effective in the teaching of projectile motion in physics, for improved achievement and retention than guided discovery method.

# Recommendations

Based on the findings and conclusion, the following recommendations were made:

- 1. Physics teachers should use demonstration method in order to give students the opportunity to be actively involved in the learning process, thereby enhancing their achievement and retention
- 2. In-service training and workshops should be organized for Physics teachers to enable them to effectively use the demonstration teaching strategy
- 3. Further research should be undertaken to ascertain teachers' perspective on effective use of demonstration method in teaching Physics concepts.

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#### TECHNOLOGICAL INNOVATIONS AND MANAGEMENT OF UNIVERSITY EDUCATION FOR JOB CREATION IN BAYELSA STATE

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#### Abstract

The study investigated technological innovations and management of university education for job creation in Bayelsa State. A descriptive survey research design was adopted for the study. The population of the study was all the 109 heads of accredited academic departments in the three conventional universities in the state (Federal University Otuoke, the Niger Delta University Amasoma and the Africa University, Toro-Oluwa. A simple random sampling technique was used to select 75 of them for the study. Three research questions and one hypothesis were raised to guide the study. The instrument for data collection was a questionnaire titled "Technological Innovations in Management of University Education for Job Creation in Bayelsa State Questionnaire (TIMUEJBSQUE)". It was designed, validated and pilot-tested (N=20, r=.79). Data obtained after administering it on the study sample was analyzed using descriptive statistic of mean was used to answer the research questions while Pearson r statistic was used to test the hypothesis at 0.05 level of significance. The result revealed that there is low extent of technological innovations in the management of university education in the State; that technological innovation has impacted highly in the management of university education and that high technological innovation in management of university education could lead to low job opportunities in the State . The study further revealed a significant relationship between technological innovations and job creation. The paper recommended among others that universities should increase their investment in technological innovations so as to increase efficiency in management of universities.

Keywords: Technological Innovations, Universities Education, Job Creation

# Introduction

The university system is operationally designed to ensure availability of high level manpower for industrial and societal advancement. It should therefore be in a better position to develop and adopt new trend of technology. As an institution of higher learning, it is expected to play significant roles in solving human problems including creating jobs for the ever increasing population in its immediate environment. However, this expectation is possible if the managers are able to embrace technological innovations in pursuit of mandates. It has therefore become imperative that the universities should assume this vital role through research/discoveries and teaching. The universities should be able to partner with industrial sectors and other cooperate entities towards pursuing this noble goal. Just as Obi-Omovoh and Nwagwu (2018) noted the universities should not just give admission to indigenous members of host communities, but be seen to be making efforts in solving other problems including eradicating poverty, providing electricity, health etc through research and knowledge dissemination thereby creating job opportunities. Although Sahin (2016) asserted that the various ways of introducing technology in university administration for effective management includes submission of lesson plans and teaching through available software; foster technology growth by asking parents to write; e-mail addresses on medical forms; insist that all teachers create a class web page; attend technology conferences to see what other schools are doing, what other teachers are doing to integrate technology, and what lecturers are doing to encourage the use of technology in their schools and classrooms. The university system should lead in the aspect of technological innovations that would create job. The concern here, should also be to integrate the technological discoveries for job creation to benefits the host environment and not cause a diminution of the existing job opportunities.

Richa, Shayne, Ramesh and Richard (2020) discovered that various measures have been proposed in the form of best practices or models to improve the effectiveness of university industries collaboration (UIC) that would lead to job creation. They however noted that these measures often address a specific concern such as technology transfer, intellectual property (IP), etc. There should be a new order for a comprehensive holistic framework to address many aspects of university industries collaboration (UIC) in order to improve effectiveness and achieve success of bot the university and the industries (Richa, Shayne, Ramesh & Richard, 2020).

Technological innovation and change drives long-term economic growth, productivity and improved standards of living. It is also good to note that new technologies could destroy jobs in some industries, especially among the low-skilled, while creating jobs which are often in different industries and require different skills. However, the process could lead to new job creation, as new industries would replace old ones and the skills of workers adapt to changing and expanding demand. The universities therefore could become key players to adopt and develop these skills required to drive these innovations. According to the report of the Technology, Productivity and Job Creation best Policy Practices in the United States, technology and innovation itself is not bad, its economy-wide and employment impact is likely to be positive provided that the mechanisms for translating technology into jobs are not impaired by deficiencies in training and innovation systems and rigidities in product, labour and financial markets (United States Strategy on Job Creation, 2020). The university system is expected to be flexible in management to ensure direction towards coping with technological innovations. The curriculum should be re-directed to the need of the society and not just the old style intellectual management. Morales, Nielsen and Bacarini, Martinelli, Kofuji, Garcia and Díaz (2018), conceptually, used a model that focuses on competences, tools, skills and behaviors from knowledge base to derive a new model of learning for higher education, using an organizational framework like the university system to identify different ways to obtain a panoply of competencies that will facilitate technology and innovation management issues at individual business and regional level, particularly for small-and-medium-sized enterprises (SMEs). They tried to address challenges related to new innovative relationships and product opportunities emerging from traditional sectors, but also from nanotechnology, biotech and ICT fields, with particular emphasis on environmental and sustainability problems. They however suggested that redesigning a curricular for many programs for higher education, in accordance with the Latin American and European realities should be implemented to facilitate this expected collaboration (Morales, Nielsen and Bacarini, Martinelli, Kofuji & Díaz, 2018).

Adeoti, Onwuemele, Aluko and Okuwa (2014), comparatively analyzed the patterns of university interaction for innovation that engenders inclusive development in Nigeria, and the implications of the patterns of interaction for the emergence of a functional national system of innovation. It was however, demonstrated that interactions by the sampled academics in conventional and technology universities are mainly traditional and service forms of interaction, while the academics' interaction at the agricultural university provided substantial cases of network forms of interaction that have potential for innovation for inclusive development. The findings also revealed that there is lack of entrepreneurship forms of interaction among the respondents from the three university types. This is more pronounced for the conventional and technology universities.

Technology innovation in managing university education can consistently breathe new life into the slowing or stagnated situation and act as a mechanism to enhance job creation and equip the society with ability to adapt to changing environments. Although Onukwu, Dabipi, and Okafor (2020) investigated information communication technology innovation and administrative process of universities in Bayelsa State and reported that there exist low level utilization of ICT innovations for administrative process of universities in Bayelsa State. They thus recommended strong collaboration among industries and government owned agencies for effectiveness. However, Adeoti (2015), emphasized that policies and strategies should aim at ensuring that the national system of innovation attains considerable strength that can foster a dynamic economy capable of sustainable growth, adding that universityindustry linkages are strategic in strengthening the national system of innovation and they are important catalysts for the creation of job opportunities (Adeoti, 2015).

The theoretical foundation of this study is the theory of innovative diffusion by Rogers (2010). According to the theory, the integration of technology innovations into business activities is a process whereby individuals and organizations with certain characteristics follow a set of stages to integrate a particular innovated technology for improved service delivery of the system. Similarly, if innovation is considered as a technology comprising both software and hardware. The potential perceived value of the innovation will affect the individual/organizational decision on whether to adopt it at an early stage of the integration process or to ignore it.(Rogers, 2010),Thus, in order to speed up the innovation process across universities for effective service delivery to staff and students as well as create job

opportunities, stakeholders must be prepared to adopt emerging forms of technology with minimal or no resistance to change. The concept of innovation diffusion, the integration of technology within educational activities starts with the awareness of a newly introduced technology and then proceed with the formulation of attitudes towards this technology. Afterwards, being introduced to new technologies, people across the organization make the decision asto whether or not to use that technology, last stage of the diffusion of innovation is the confirmation of using a new technology to improve university services (Sahin, 2016).

The process of technology integration within education services has been linked with the innovation diffusion process (Rogers, 2010). This theory is widely used in research to understand the state of technology integration in universities. According to Sahin (2016), the theory of innovation diffusion is the most appropriate concept for exploring the integration of developed technologies into higher education service. It shows that Rogers' theory of the diffusion of innovation has been applied by scholars from various disciplines, such as economics, political sciences, communications, technology, health sciences and education, among others. At the confirmation stage of an innovation diffusion process, institutions are able to gain an innovative value addition and increase their return on investment. Within a university setting, faculty, students and administrators may have distinct characteristics that can affect the integration of technology. Therefore, an understanding of these characteristics can form the basis for preparing them to be fully involved in the initial stages of the innovation diffusion process. A study by Krishnaveni and Meenakumari (2014) on the various functional areas to which technology is deployed for administration in higher education institutions and the current extent of usage in all these functional areas pertaining to information administration, indicated that technology innovations has been so useful in general administration, pay roll management, financial accounting, administration of student data, inventory management, personnel records maintenance and library management system. This had enhanced university administration which has also created many job opportunities for the individuals interested in university activities, which they called stakeholders (Krishnaveni & Meenakumari, 2014). The Covid-19 pandemic has created much uncertainties particularly in the area of management of education and adequately ensuring survival of the human race. It is now incumbent on the university system to reconsider its mandates and see to new discoveries through research and teaching towards meeting up with this challenge as well as ensure more job opportunities which seems to be declining due to the pandemic. Hence, this study is interested in the technological innovations and management of university education for job creation in Bayelsa State.

### **Statement of Problem**

Technology innovations in managing university education can consistently breathe new life into the slowing or stagnated situation and act as a mechanism to enhance job creation. It has the capacity to equip the society with ability to adapt to changing environments. However, it appears that many Nigerian universities have not attained this expectation as evident in the number of university graduates currently unemployed and other societal problems facing our society. The lack of scientific and technological discovery capacities of universities in some developing countries was considered and there seems to exist a pathetic situation where some universities and their management team could be considered not strategic in adopting technological innovations and good collaboration with relevant industries in management of the universities for job creation. Consequently, these universities are considered fruitless as manifested in unemployment situations that seems an unsolvable problem in Nigeria society today. This paper therefore is interested to ascertain the extent to which universities deploy technological innovations in management of its affairs for job creation as well as the benefits of these expected innovations on the immediate society. It is focused on the Universities in Bayelsa State, Nigeria.

# **Purpose of Study**

The study is mainly to investigate technological innovation and management of university education for job creation in Bayelsa State. Specially, the study will:

- 1. ascertain the extent of technological innovations in management of university education in Bayelsa State.
- 2. find out the extent to which technological innovation has impacted the management of university in Bayelsa State.
- 3. evaluate the extent to which technology innovation in management of university education will create job in Bayelsa State.
- 4. ascertain if there is a relationship between technological innovation in management of university education and job creation in Bayelsa State.

# **Research Questions**

The following research questions guided the study:

- 1. To what extent is technological innovation applied in management of university education in Bayelsa State?
- 2. To what extent has technological innovations impacted in the management of university education in Bayelsa State?
- 3. To what extent will technological innovations in management of university education create more job opportunities in Bayelsa State?

# Hypothesis

There is no significant relationship between technological innovation in management of university education and job creation in Bayelsa State.

# Methodology

A descriptive research design was adopted for the study. The population of the study were all the 109 heads of accredited academic departments in the three conventional universities in the state (Federal University Otuoke, the Niger Delta University Amasoma and the Africa University, Toro-Oluwa. A simple random sampling technique was used to select 75 of them for the study. Three research questions and one hypothesis were raised to guide the study. The instrument for data collection was a questionnaire titled "Technological Innovations in Management of University Education for Job Creation in Bayelsa State Questionnaire (TIMUEJBSQUE)" designed by the researchers. It was validated and pilot-tested (N=20, r=.79). A google-online form was designed and used for the administration of the instruments in various whatsapp platforms of Heads of Departments. The respondents were requested to indicate from very high extent (VHE), high extent(HE), low extent(LE) and very low extent (VLE) in the questionnaire. At the submission of the form, it was received by the researchers through their email addresses. A total of seventy five (75) heads of academic departments were sampled. However, only Seventy (70), indicating ninety three percent (93%) hit the inbox of the researchers (i.e were returned). Descriptive statistic of mean was used to answer the research questions while Pearson r statistic was used to test the hypothesis at 0.05 level of significance.

## **Results**

**Research Question 1:** To what extent is technological innovation applied in management of university education in Bayelsa State.

To answer question 1, heads of academic departments in the three conventional universities in Bayelsa State were requested to rate the extent to which technological innovations is applied to the management of university education for job creation in the state on a 4-point rating scale from very high extent (VHE) to very low extent (VLE). Their responses were descriptively analyzed and result presented in Table 1.

#### Table 1: Mean and standard deviation for the extent of technological innovation in management of university education in Bayelsa State

Description	Ν	Mean (X)	SD	Remark
Teaching and Learning Software	70	2.10	0.42	Low Extent
Administration/Record Keeping	70	2.51	0.38	High Extent
Research and Laboratory usage	70	1.91	0.42	Low Extent
Personnel/Student performance	70	2.41	0.44	Low Extent
Management				
Total Mean		2.23	0.42	Low Extent
Theoretical Mean – 2 50: N–70				

Theoretical Mean = 2.50; N = /0

The data in Table I shows that there is a low extent of technological innovation in management of university education in Bayelsa State with a mean score of (2.23). However, Administration/ record keeping recorded high extent with a mean score of (2.51), teaching and learning software recorded low extent with a mean score of (2.10), research and laboratory usage also recorded low extent with a mean score of (1.91) while personnel/student performance management recorded low extent a mean score of (2.41).

Research Question 2: To what extent is the technological innovations impacted in management of university education in Bayelsa State

To answer question 2, the same heads of academic departments in the three conventional universities in Bayelsa State were requested to rate the impact of technological innovations in management of university education for job creation in the state on a 4-point rating scale from very high extent (VHE) to very low extent (VLE). Their responses were descriptively analyzed and result presented in Table 2.

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#### Table 2: Mean and standard deviation for the impact of technological innovation in management of university education in Bayelsa State

Description	Ν	Mean (X)	SD	Remark
Effectiveness and Efficiency	70	2.91	0.47	High Extent
New Skills	70	2.51	0.42	High Extent
University Industry	70	2.51	0.42	High Extent
Collaboration(UIC)				
Research/knowledge dissemination	70	2.61	0.38	High Extent
Total Mean		2.64	0.42	High Extent

Theoretical Mean = 2.50; N=70

The data in Table 2, indicated high extent impact of technological innovations in management of university education in Bayelsa state with a mean score of (2.64). Effectiveness and efficiency recorded high extent with a mean score of (2.91), new skills recorded high extent with a mean score of 2.52, research/knowledge dissemination also recorded high extent with a mean score of (2.61), while university industry collaboration recorded high extent with a mean score of (2.51).

Research Question 3: To what extent will technological innovations in management of university education create more job opportunities in Bayelsa State.

To answer question 3, the same heads of academic departments in the three conventional universities in Bayelsa State were also requested to rate the extent to which technological innovations in management of university education will create more job in Bayelsa State on a 4-point rating scale from very high extent (VHE) to very low extent(VLE). Their responses were descriptively analyzed and result presented in Table 3.

#### Table 3: Mean and standard deviation for technological innovation in management of university education and job creation in Bayelsa State

Description	Ν	Mean (X)	SD	Remark
More Job Opportunities	70	1.61	0.42	Low Extent
Youth Training/Empowerment	70	2.51	0.44	Low Extent
Entrepreneurial opportunities	70	2.13	0.38	Low Extent
Improved welfare for Host	70	2.41	0.42	Low Extent
Community /Stakeholders				
Total Mean		2.17	0.42	Low Extent
Theoretical Mean = $2.50$ : N=70				

The data in Table 3 shows that technological innovations in management of university education will create job to a low extent with a mean score of (2.17). Creation of more job opportunities recorded low extent with a mean score of (1.61). However, youth training/empowerment recorded high extent with a mean score of (2.51), entrepreneurial opportunities recorded low extent with a mean score of (2.13) and then improved welfare for host community/stakeholders recorded low extent with a mean score of (2.41).

**Hypothesis:** There is no significant relationship between technological innovation in management of university education and job creation in Bayelsa State.

The hypothesis was tested using the Pearson product moment correlation statistic at 0.05 level of significance. The data analysis is presented in Table 4.

# Table 4:Correlation summary of the relationship between technological innovation in<br/>management of university education and job creation in Bayelsa State

VARIABLE	Ν	r	df	Sig. (2-tailed)	
Technological Innovation	70	.203	2	.000	
Job Creation					

*p*<0.05

The data in Table 4, shows the Pearson r value of (.203) with a p value of (.000) at an alpha level of 0.05. The p value of (.000) is less than the alpha value of (0.05). Thus, the hypothesis which states that there is no significant relationship between technology innovation in management of university education and job creation in Bayelsa State is rejected. The analysis therefore confirms that there is a significant relationship between Technological innovation in management of university and job creation.

### **Discussion of Findings**

The result of question 1 revealed low extent in technological innovation in management of university education in Bayelsa State. This could be attributed to poor funding of the universities and research process in Nigeria. These universities, owned by federal and state government are usually constrained in terms of available resources that could be channeled into technology and innovation. Past and even present leadership of governments are seen to be funding physical projects that will receive instant praises from the public thereby neglecting the educational system with long terms consequences. One of the consequences is hereby revealed by this study. This, equally confirms the assertion of Sagasti (1979) that the lack of scientific and technological discovery capacities of universities in some developing countries was considered as an illustration. However, Administration and record keeping recorded high extent which collaborates the findings of Krishnaveni & Meenakumari (2014); Onukwu, Dabipi, & Okafor (2020).

Analysis from research question 2 revealed high extent benefits from technology innovation in management of university. This is quite expected as deployment of innovative technologies would lead to effectiveness, new skills and new discoveries as well as help solve societal problems. It therefore confirms the report of Sahin (2016) that the last stage of the diffusion of innovation is the confirmation of using a new technology to improve university services which is revealed in this study as seen in the high extent response that technology innovations would create new skills, increase effectiveness and efficiency, increase university industries collaboration. The study supports the assertion of Adeoti (2015), that universityindustry linkages are strategic in strengthening the national system of innovation and they are important catalysts for the creation of job opportunities.

Research question 3 revealed low extent in the creation of more job opportunities, entrepreneurship opportunities and improved welfare for host communities and stakeholders. The study is in disagreement with the findings of Adeoti (2015), that university-industry linkages are strategic in strengthening the national system of innovation and they are important catalysts for the creation of job opportunities; and also the findings of Richa, Shayne, Ramesh and Richard (2020) that discovered various measures proposed in the form of best practices or models to improve the effectiveness of University Industries Collaboration (UIC), that would lead to job creation. The study also collaborate the assertion of Obi-Omovoh and Nwagwu (2018) that the universities should not just give admission to indigenous members of host communities, but be seen to be making efforts in solving other problems including eradicating poverty, providing electricity, health etc through research and knowledge dissemination thereby creating job opportunities.

The hypothesis revealed a significant relationship between technology innovation in management of university education and job creation. It is a confirmation that universities should help through its research and teaching, to create job opportunities for stakeholders. Sahin (2016) had asserted that technology innovations would create new skills, increase effectiveness and efficiency and new skills usually lead to jobs for individuals who acquired the skills. It also confirms the reports of Technology, Productivity and Job Creation Best Policy Practices (2020) in the United States of America that the wide economic impact of technology innovation is usually positive for job creation.

### Conclusion

Technological innovations for job creation particularly in the university system should be considered a priority for day-to-day activities as the university system has the capacity to equip the society with the ability to adapt to changing environments. They should therefore become key players to adopt and develop these skills required to drive these innovations through application to day-today activities, research and teaching. Dr. H. O. Alonge & Dr. James N. Onukwu

#### Recommendations

Based on the finding of this study, the following recommendations were made;

- 1. University managers should support technology innovations by providing more resources towards its discovery and application, to increase effectiveness/efficiency of the university system.
- 2. Flexibility in management of university education is expected so as to adopt new technology and innovations.
- 3. Universities should strengthen and increase their collaboration with industries to ensure support in terms of skills and service delivery.
- 4. Universities should also see job creation as part of their mandate and improve their activities towards creating new skills for more jobs by consistently reviewing their curriculum to match industrial and societal expectations.

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#### EFFECTS OF MODELS AND REALIA ON STUDENTS' ACADEMIC PERFORMANCE IN BIOLOGY IN ABAK LOCAL GOVERNMENT AREA

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#### Abstract

This study assessed the effects of models and realia on students' academic performance in Biology in Abak Local Government Area of Akwa Ibom State. Two research questions and two hypotheses were formulated to guide the study. The research design adopted was pretest, post-test quasi experimental research design. The population of the study comprised 2625 senior secondary school two (SS II) Biology students in the 11 public co-educational secondary schools in Abak Local Government Area. A sample size of 131 senior secondary two (SS II) students from two public secondary schools in the 2019/2020 academic session, was randomly drawn for the study. The instrument used was Biology Performance Test (BPT) with a reliability index of 0.82, obtained using Pearson's product moment correlation formula, through a test re-test approach. The research questions were answered using mean, standard deviation while hypotheses were tested at 0.05 probability level using analysis of covariance (ANCOVA). The result showed that there exist significant difference in the academic performance of Biology students taught using models and realia. Based on the findings, it was concluded that the utilization of realia encourages students' participation in instructional practices and increases the academic performance of students in Biology in Secondary Schools. It was recommended among others that teachers should strive to use realia in teaching biology concepts as this would help to concretize learning and hence facilitate academic performance of students in biology.

Keywords: Models, Realia, Students' Academic Performance, Biology

### Introduction

Biology is coined from two Greek words "Bios" and "Logos" which means "life" and "Study", respectively. Biology therefore is the study of living things (plants and animals). Biology engages the people to understand the world around them and so have the ability to make informed choices about their healthcare, the environment and the society in which they live (Ihejiamaizu & Ochui, 2016).

The teaching of Biology in Secondary Schools alongside other science subjects enable the nation to achieve the goals and objectives in developing the nation scientifically. In view of the significance role of biology in national development, biology has been listed as one of the

core subject among the curriculum offerings at the secondary school level in Nigeria (Federal Ministry of Education, 2009).Despite the important role of biological science in national development, research reports indicate that students' performance in the subject is persistently poor (Yara, 2009; Umoh, 2018). Many reasons have been advanced for the situation, one of which is lack of proper use of instructional materials in teaching biology (Umoh & Etopotu, 2018).

Instructional materials are resources for science teaching. They are the resources that are used in the teaching-learning processes for acquisition of relevant knowledge in biology needed for future and advanced studies in biological sciences. They enhance effective and meaningful learning and encourage students' active participation in science lessons (Atadoga & Falalu, 2015). Instructional materials for science teaching can be broadly grouped into two: human and non-human resources. The human resources include science teachers, laboratory technologists, laboratory assistants, professionals in science and science related fields, and artisans. The non-human resources include realias, models, charts, natural environment and assorted laboratory equipment. In the context of this study, realia are real materials in the environment which can be employed in the teaching/learning processes. They include school garden, ponds, streams, life-plants and animals, fish ponds, poultry farm and aquarium which can be employed in the teaching of different concepts in Biology (Adamu, 2013), for acquisition of necessary laboratory and field skills in order to carry out and evaluate experiments and projects in biology. According to Amos (2016), realia are also used to connect learners with the key focal point of a lesson by allowing tactile and multidimensional connection between learned materials and the object of the lesson. This enables the learners to acquire the necessary laboratory field skills in order to carry out and evaluate experiments and projects in biology.

Models stand for the replica, copy of a thing, act or process. Thus, models can be defined as a replica, copy of real things or objects with a suitable change in size, complexity, timing, safety and cost factors for carrying out the desired instructional purpose (Ntuk, 2015; Wittich and Schuller, 2015). Models, as educationally suitable and recognizable replica of the real thing, may be of the same size (like model of a battery or globe), larger (like model of insects), or smaller (like model of the skeleton) than the thing it represent. They can be solid, hollow or may just show the outline for demonstrating the external features of the real thing. The one showing the exterior form and shape of the original are known as scale models. Some referred to as cross section models can be constructed in sections disassembled to show internal construction or structure (e.g Cross-section model of eye, ear, heart, flower or mammalian skeletal system). Others called working models, can be processes of the things represented by them (e.g Model of a joint). The functions served by the models may be summarized as follows: to show relationship such as comparisons, relative amounts, development, processes, classification and organization by means of facts, figures or statistics, to present information in a summarized form, to help in the visual presentation of the abstract ideas, to help in the quick clarification of meanings which often save considerable time presentation of the subject matter, to raise issues and help in the process of systematic thinking and intelligent understanding, and to inculcate interest, capture students' attention and provide motivation for carrying out instructional work (Udo, 2010). This brings about acquisition of necessary scientific skills like observing, grouping and interpreting biological data.

Generally, instructional materials are essential and significant tools needed for teaching and learning of school subjects to promote teachers efficiency and improve students' performance. According to Udogu and Enukora (2017), they can be defined as any device employed by teachers to transmit facts, facilitate skills/knowledge acquisition and improve on understanding learnt concepts. This creates acquisition of relevance knowledge in biology needed for future and advanced studies in biological sciences. They make learning more interesting, practical, realistic and appealing. They also enable both the teachers and students to participate actively and effectively during lessons. They give room for acquisition of skills and knowledge and development of self-confidence and self-actualization. Instructional materials are considered important in teaching and learning in all levels of education because textbooks and other resource materials are basic tools. Absence or inadequacy of these materials could make teachers handle subjects in an abstract manners, portraying it as dry and non-exciting (Eshiwang, 2014).

Correspondingly, students learn when their thoughts and expectations interact with materials, ideas, and people. Such interactions give learners meaningful developmental learning experience during the teaching and learning of Biology. Models and Realia instructional materials give teachers/students the pride of using their talents, allows a teacher to reproduce his potentials in concrete form and increase teacher's knowledge of the subject matter. The use of models and realia as instructional materials in teaching could extend the scope and power of instruction. It could also bridge the gap between the teacher and students in terms of understanding different concepts in the lesson, thereby making learning more immediate and more relevant. Moreover, educators have known that, the educational experiences involving the learner actively participating in concrete example are retained longer than abstract experiences.

### Statement of the Problem

Personal observation has shown that memorization of facts has replaced experimentation in biology teaching in many Nigerian schools. This is due to the fact that materials are not available or are inadequate in some schools. This is made manifest in poor academic performance of students and low interest in science generally, and in biology particularly among secondary school students in Abak Local Government Area. Considering the role of biology in the development of any nation and more so in a country considered to be developing like Nigeria, this has prompted the researcher to ask the question: Could the use of models and realia instructional materials influence the academic performance of students in biology? The need of providing answer to the question therefore motivated the researcher to investigate the effect of models and realia on the academic performance of students in biology. The findings of this study will thus provide answer to some other questions such as: Does students taught with models instructional materials perform better than students taught with realia instructional materials in biology?

# **Purpose of the Study**

The purpose of this study was to investigate the effects of models and realia on students' academic performance in biology in Abak Local Government Area. Specifically, the study sought to compare the mean performance scores of biology students taught using models and those taught using realia.

### **Research Question**

One research question was raised to guide the study:

What is the difference in the mean performance scores of Biology students taught using models and those taught using Realia?

#### Hypothesis

A null hypothesis was formulated for the study and tested at 0.05 level of significance:

There is no significant difference in the mean performance scores of Biology students taught using models and those taught using realia.

#### **Research Method**

The research design adopted for the study was pre-test, post-test quasi-experimental design. The design is considered appropriate for the study because the researcher manipulated the independent variables (Models and Realia) and checked its effect on the dependent variable (students' academic performance) in Biology, in secondary schools in Abak Local Government Area. Abak Local Government Area is in the southwest of Akwa Ibom State. There are 11 public Secondary Schools, all of which are co-educational.

The population of the study consisted of 2,625 Senior Secondary Two (SS II) Biology Students in the 11 public Secondary Schools for 2019/2020 session. The sample size of 131 SS II students from two public Secondary Schools were used for the study. The procedure involved identification of all the public secondary schools in the area and writing the names of the schools on a paper. Thereafter, the paper was cut and folded in a basket and the first two schools selected were used for the study (simple balloting). One of the Senior Secondary Schools was randomly chosen as the experimental group, while the other was used as control group. The instrument for the study was a researcher-made achievement test tagged "Biology Performance Test" (BPT). The BPT was designed with questions drawn from the concept of "Flowering Plants" to test the academic performance of the students. The face and content validity of the BPT was ascertained by submitting the draft of the BPT which contained 20 items, to three Biology teachers. For face validation, they checked for appropriateness of the test items as regards the objectives of the study. Content validity was also ensured using test blueprint. Test-retest method was used for the reliability of the research instrument. The BPT was administered first to 30 SS II students in one public secondary school of the same population but which did not take part in the study, using test-re-test method. Its reliability coefficient was established using Pearson's Product Moment Correlation formula which yielded 0.82. This indicated a high correlation index and the instrument was considered reliable.

In the course of the study, the researcher personally visited the selected schools to administer the instrument, after securing permission from the schools authorities. The Biology teachers acted as research assistants. They administered the pretest which lasted for 45 minutes to the students in the sampled schools, after which the scripts were collected for marking. Two days after, the concept of flowering plant was taught by the researcher. During the lesson period for the experimental group, realia materials were used in teaching, while the control group in the other school was taught with the use of model materials. One week after the lesson

presentation, BPT was administered to the students, after which the scripts were collected immediately to ensure 100% return. The collated data were coded for analyses, from which the research questions were answered using mean, standard deviation while hypotheses were tested at 0.05 probability level using analysis of covariance (ANCOVA).

# Results

**Research Question 1:** What is the difference in the mean performance scores of Biology students taught the concept of flowering plants using models and those taught using Realia?

# Table 1: Estimated marginal means of post-performance by treatment

	95% Confidence Interval				
Treatment	Mean	Std. E.	Lower Bound	<b>Upper Bound</b>	
Students taught using Models	13.49	.283	12.926	14.047	
Students taught using Realia	16.62	.289	16.048	17.191	

Table 1 showed that Biology Students taught using realia had higher post-performance mean score ( $_X = 16.62$ ), while biology students taught using models had the least post-performance mean score ( $_X = 13.49$ ). This means that there was difference in the academic performance of students taught using Models and those taught using realia.

# **Testing the Hypothesis**

**Hypothesis:** There is no significant difference in the performance mean scores of students taught using models and those students taught using realia

Source	Type III sum of Square	Df	Mean Square	$\mathbf{F}$	Sig.
Corrected Model	352.547	4	88.137	18.973	.000
Intercept	3443.067	1	3443.067	741.164	.000
Pre-performance	13.945	1	13.945	3.002	.086
Treatment	273.485	1	273.485	58.871	.000
Error	585.331	126	4.645		
Total	30533.000	131			
Corrected Total	937.878	130			

# Table 2: Analysis of Covariance (ANCOVA) of post-performance scores by treatment

a. R Squared = .376 (Adjusted R Squared = .356)

Table 3 revealed the F-value  $(_{1,130})=58.871$ ; P<0.05}. Thus, the hypothesis was rejected. This implies that there is a significant difference in the mean score of students' academic performance in Biology when taught the concept of flowering plants in Biology using models and those taught using realia. Hence, realia has been found to be effective in enhancing students' academic performance in Biology. Thus, based on values on Table 1, the mean difference earlier observed is statistically significance at .05 probability level.

# Summary of Finding

The findings established is that there is significant difference in the performance mean scores of Biology students taught using models and those students taught using realia.

# **Discussion of Finding**

The finding obtained for hypothesis 1 showed that there exist a significant difference in the academic performance of students taught the concept of flowering plant using realia and models. This findings which is in favour of realia means that when Biology teachers employ realia in teaching, it strengthens students' associations between words for common objects and the objects themselves. The possibility of manipulating the realia and looking within objects makes it an important learning tool in Biology. This finding agrees with Adamu (2013), who opined that realia are objects from real life used in classroom instruction by educators to improve students' understanding of concepts.

### Conclusion

Based on the finding of this study, it was concluded that students taught the concept of flowering plant using realia performed better academically than students taught the concept of flowering plant using models. This means that the utilization of realia encourages students' participation in instructional practices and increases the academic performances of students in biology in secondary schools.

# **Educational Implications of the Finding**

This study exposes the utilization of realia as an instructional material that teachers of biology could adopt so that students in their classes will benefit maximally, thereby meeting the needs of individual students in the class. The result of the study also forms a different dimension of innovation in the teaching and learning of Biology. It also have positive effect on students as the instructional materials motivated them to achieve excellent performance in Biology which may have a ripple effect in their performance in other subjects as a result of an increased confidence.

Another educational implication of the study is that, it helps students improve their understanding of the abstract concepts of biology. Also, this study will assist biology textbook writers to focus on realia as instructional material for their write-up especially on practical aspects. Moreover, the study further exposes the curriculum planners to suggest realia as relevant instructional materials for utilization in Biology curriculum.

#### Recommendations

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

- 1. Teachers should strive to use the realia in teaching Biology concepts as this would help to concretize learning and hence facilitates academic performance of students in Biology
- 2. In-service training programmes for Biology as well as all science teachers in form of workshop, seminars and conferences should be conducted by science teachers' association or ministry of education on effective use of realia instructional materials in the teaching of science concepts in biology.
- 3. Government should ensure adequate provision of science instructional materials like realia that could aid effective teaching of practical and abstract aspect of biology in schools.

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## NIGERIAN EDUCATIONAL SYSTEM: IS CURRICULUM THE PROBLEM?

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#### Abstract

The curriculum serves teaching and learning functions in the Nigerian education system. In this paper, the features and structures of the Nigerian curricula at the lower basic education level, upper basic education level and post-basic education level are examined, and the challenges to their implementation are highlighted. Suggestions for the effective implementation have been proffered, one of which is the provision of needed materials and learning facilities.

Keywords: Nigerian Educational System, Education System, Curriculum

### Introduction

A lot of criticisms have trailed the Nigerian curriculum over the years. Some persons have attributed the weakness of Nigerian educational system mainly to deficient curriculum contents. While this paper does not claim that Nigeria has a perfect curriculum, it seeks to establish that the major problem of the Nigerian educational system is the implementation of the curriculum, and not the curriculum per se. The three major stages in curriculum practice are curriculum development, implementation and evaluation. It is at the implementation stage that Nigerian curriculum practice encounters serious impediment. It is against this background that this paper will examine the meaning of curriculum, the concept of curriculum implementation, the philosophy, features and structure of the Nigerian curriculum, the nexus between effective curriculum implementation and educational development and the challenges of curriculum implementation in Nigeria.

# What is Curriculum?

The curriculum is an instrument of education. Simply put, it is the consciously planned programme of activities intended for execution in the school for the purpose of equipping learners with relevant life skills, knowledge, competencies and values that are sine qua non for effective living in the society. According to some experts, curriculum can be viewed from two perspectives: The traditional and the progressive viewpoints. According to the traditionalists, curriculum is simply a subject matter, courses of study or planned experiences for learners under the guidance of the school. The progressives view curriculum as the planned and unplanned learning experiences which may be implemented in school and/or out of school. (Nwagu, 2019; Ivowi, 2004; Onwuka, 1996). It is through the instrumentality of the curriculum that governments all over the world promote societal development. According to Ekwukoma, Adigun and Uwadileke (2016), the curriculum is the sum total of all the experience given to the learners under the guidance of the school. Tanner and Tanner in Apeji (2017) described the curriculum as the planned and guided learning experiences and intended learning outcomes formulated through the systematic reconstruction of knowledge and experiences under the guidance of the school for learners' continuous and willful growth in personal-social competences. Adams and Adams (2003) posited that curriculum usually incorporates the planned interaction of pupils with instructional contents, materials, resources and processes for the attainment of the stated learning objectives. The authors of this paper see curriculum as a policy statement of the government on the contents to be covered by learners in every subject.

# **Curriculum Implementation**

After the development of the curriculum, the next critical stage in the process is its implementation, which is the sum total of all the organized activities geared towards the actualization of the goals and objectives of a curriculum. Curriculum implementation, therefore, is the translation of theory into practice, or proposal into action. It is the process of putting all the plans in the curriculum into practice in the school through the combined efforts of the government, teachers, learners, school administrators, parents as well as their interactions with the physical facilities, instructional materials, psychological and social environment (Ekwukoma, Adigun & Uwadileke, 2016). This implies that curriculum implementation is all encompassing; that is, all hands have to be on deck for any curriculum to be effectively implemented. It is not the exclusive responsibility of any of any of the actors in the educational system – it is the responsibility of all.

### The Nexus between Effective Curriculum Implementation and National Development

Education is acknowledged across the world as the bedrock of growth and development. No state or nation can develop beyond the level of the education of its citizens. Remarkably, events world over have shown that the best investment that any government can make to secure the future generation is quality education; and this can only be achieved through the effective implementation of the curriculum. While curriculum is the instrument of education, education is the instrument for development. The strength and level of development of any nation depends largely on the strength of its educational system; and the strength of every educational system are the issues of curriculum implementation. It is through the effective implementation of the instructional contents of the curriculum that any government can equip the younger generation with the knowledge, competencies, values and life skills requisite for successful living in the society – and it is these skills that engender national development.

# The Nigerian Curriculum: Philosophy, Features and Structure

The Nigerian curriculum is designed in line with the educational philosophical tenets of the country. That is, our curriculum is designed in conformity with our philosophy of education which is enshrined in the National Policy on Education, 1977 (revised in 1981, 1998, 2004, 2009 and 2013). According to the National Policy on Education (2013), Nigeria's philosophy of education is based on the following set of beliefs:

- a. education is an instrument for national development and social change;
- b. education is vital for the promotion of a progressive and united Nigeria;
- c. education maximizes the creative potentials and skills of the individual for selffulfillment and general development of the society;
- d. education is compulsory and a right of every Nigerian irrespective of gender, social status, religion, colour, ethnic background and any peculiar individual changes; and
- e. education is to be qualitative, comprehensive, functional and relevant to the needs of the society.

Every subject's curriculum is distinctively designed to have a theme. Under each theme, relevant topics, performance objectives, contents, teacher's activities, students' activities, teaching and learning materials and evaluation guides are provided. In line with the submission of Fafunwa (1967), the objectives of the Nigerian curriculum are premised on the values and needs of the Nigerian society and the learning experiences recommended in the curriculum are geared towards the realization of the expressed objectives. Currently, the Nigerian curriculum system has a very unique structure which every actor in the education sector must understand for effective implementation. Without a thorough understanding of the structure of the curriculum, it cannot be effectively implemented.

# Lower Basic Education Level (Primary 1-3)

At the lower basic education level, the following subjects are offered by pupils:

- 1. English Studies
- 2. One Nigerian Language
- 3. Mathematics
- 4. Basic Science and Technology
  - Basic Science
  - Basic Technology
  - Information Technology
  - Physical and Health Education
- 5. National Values
  - Social Studies
  - Civic Education
  - Security Education
- 6. Christian Religious Studies
- 7. Islamic Studies
- 8. Cultural and Creative Arts
- 9. Arabic (Optional)

# Middle Basic Education Level (Primary 4-6)

The following subjects are recommended for pupils at this level in Nigerian schools:

- 1. English Studies
- 2. One Nigerian Language
- 3. Mathematics
- 4. Basic Science and Technology
  - Basic Science
  - Basic Technology
  - Information Technology
  - Physical and Health Education
- 5. National Values
  - Social Studies
  - Civic Education
  - Security Education
- 6. Christian Religious Studies
- 7. Islamic Studies

9.

5.

- 8. Pre-Vocational Studies
  - Home Economics
    - Agriculture
  - French Language
- 10. Cultural and Creative Arts
- 11. Arabic (Optional)

# **Upper Basic Education Level (Junior Secondary 1-3)**

The following subjects are recommended for students immediately after primary education in Nigerian schools:

- 1. English Studies
- 2. One Nigerian Language
- 3. Mathematics
- 4. Basic Science and Technology
  - Basic Science
  - Basic Technology
  - Information Technology
  - Physical and Health Education
  - National Values
    - Social Studies
    - Civic Education
    - Security Education
- 6. Christian Religious Studies
- 7. Islamic Studies
- 8. Pre-Vocational Studies
  - Home Economics
    - Agriculture

- 9. French Language
- 10. Cultural and Creative Arts
- 11. Business Studies (Introduced in JSS1)
- 12. Arabic (Optional)

## Post Basic Education Level (Senior Secondary Education)

The Senior Secondary Education Curriculum (SSEC) in Nigeria is designed to carter for the differences in talents, opportunities and future roles of individuals. The curriculum is developed to provide manpower in the applied science, technology and commerce. Technical knowledge and vocational skills necessary for industrial and economic development are considered in the development of the curriculum. The curriculum is learner-centered, thematic and activity based (Obioma, 2012).

Below is the structure of the Senior Secondary Education Curriculum (SSEC):

It has the following four Fields of Studies:

- 1. Science and Mathematics
- 2. Humanities
- 3. Technology

i.

4. Business Studies

The subjects in the four distinct fields of study are:

- Science and Mathematics
  - Physics
  - Chemistry
  - Biology
  - Further Mathematics
  - Health Education
  - Physical Education
  - Agriculture
  - Computer Studies

### ii. **The Humanities**

- Economics
- Geography
- Government
- History
- Literature-in-English
- Christian Religious Studies
- Islamic Studies
- Visual Arts
- Music
- French
- Arabic
- Any Nigerian Language

### iii. Technology

- Technical Drawing
- General Metal Work

- Basic Electricity
- Electronics
- Auto-Mechanics
- Building Construction
- Wood Work
- Home Management
- Foods & Nutrition

#### iv. Business Studies

- Accounting
- Insurance
- Stores Management
- Office Practice
- Commerce

### Trade/Entrepreneurship

The SSEC is also made up of 34 Trade / Entrepreneurship Subjects. Students are to select one Trade/Entrepreneurship Subject from the list of the 34 Trade / Entrepreneurship Subjects which are:

- 1. Auto Body Repair and Spray Painting
- 2. Auto Electrical Work
- 3. Auto Mechanical Work
- 4. Auto Parts Merchandising
- 5. Air Conditioning and Refrigeration
- 6. Welding and Fabrication Engineering Craft Practice
- 7. Electrical Installation and Maintenance Work
- 8. Radio, TV and Electronic Servicing
- 9. Block Laying, Brick Laying and Concrete Work
- 10. Painting and Decorating
- 11. Plumbing and Pipe Fitting
- 12. Machine Woodworking
- 13. Carpentry and Joinery
- 14. Furniture Making
- 15. Upholstery
- 16. Catering and Craft Practice
- 17. Garment Making
- 18. Clothing and Textile
- 19. Dyeing and Bleaching
- 20. Printing Craft Practice
- 21. Cosmetology
- 22. Photography
- 23. Mining
- 24. Tourism
- 25. Leather Goods Manufacturing and Repair
- 26. Stenography
- 27. Data Processing
- 28. Store Keeping
- 29. Book Keeping

- 30. GSM Maintenance and Repairs
- 31. Animal Husbandry
- 32. Fishery
- 33. Marketing
- 34. Salesmanship

### **Compulsory Cross-Cutting Subjects**

- English Language
- General Mathematics
- Civic Education
- Trade/Entrepreneurship Subject

Each student is expected to compulsorily take the four (4) cross-cutting subjects listed above. For the Trade/Entrepreneurship subject, each student is expected to select one (1) Trade/Entrepreneurship subject from the list of 34 Trade/Entrepreneurship subjects. The Post Basic Education Curriculum in Nigeria is therefore comprised of:

- A group of 4 compulsory, cross-cutting core subjects that must be offered by all students;
- Four fields of studies;
- A group of 34 Trade/Entrepreneurship subjects;
- Elective subjects.

A field of study is a group of subjects representing a student's potential area of specialization. Based on the structure, students are to:

- Offer all the 4 compulsory, cross-cutting core subjects, namely: English Language, General Mathematics, Civic Education and a Trade/Entrepreneurship Subject.
- Choose two (2), three (3), four (4), or five (5) subjects from each of their preferred four fields of studies depending on their potential, interest and capability such that the minimum number of subjects is eight (8) while the maximum number of subjects is nine (9).

It is pertinent to further note that:

- If students select two (2) subjects from a Field of Study, they can select two (2) or three (3) subjects from any other Field of Study or from Trade/Entrepreneurship subjects to make a minimum of eight (8) or maximum of nine (9) subjects.
- If students select three (3) subjects from a Field of Study, they can select one (1) or two (2) subjects from any other Field of Studies or Trade/Entrepreneurship subjects to make a minimum of eight (8) and a maximum of nine (9) subjects.
- If students select four (4) subjects from a Field of Study, they can select one (1) more subject from any other fields of study or Trade/Entrepreneurship subjects to make a maximum of nine (9) subjects.
- If students select five (5) from a Field of Study, they have already selected the maximum which is nine (9) subjects.
- In all, students are to select a minimum of eight (8) or a maximum of nine (9) subjects.

From the preceding discourse and a thorough examination of the Nigerian secondary school curriculum, it is crystal clear that the Nigerian curriculum, from primary to post-primary education levels, is well-structured and replete with a wide variety of contents and activities that are geared towards promoting learning and building the competence of learners in various subjects and areas of specialization. The Nigerian curriculum is designed to make learners relevant globally. This position of the authors is further corroborated by the actions of some countries that have sent emissaries to Nigeria to study and adapt our curriculum. It is implementation that brings out the beauty of any curriculum. A good curriculum that is poorly implemented is as bad curriculum.

# Challenges to Effective Curriculum Implementation in Nigeria

From the preceding discussion, it is very clear that Nigeria has a well-structured and developed curriculum system that can help the nation to adequately empower the future generation and attain sustainable national development. The problem with our curriculum practice is at the implementation stage. The major problems of implementation can be summarized as follows:

- non-availability of qualified and competent personnel in the system due to the politicization of staff recruitment exercises;
- non-availability of material resources and poor funding;
- corruption and lack of patriotism, commitment and administrative will (Ivowi, 2004).

The authors are not insinuating that our curriculum practice is the best, but what they are saying is that the curricula currently in use can satisfactorily meet our needs if the right things are done.

### Suggestions

To effectively implement the curriculum, the following should be done:

- 1. The government must ensure that only qualified and competent teaching and non-teaching personnel are employed to teach in schools.
- 2. Recruitment exercises for teachers must not be politicized it should be purely based on merit.
- 3. The education sector should be adequately funded to provide the needed material resources and learning facilities for effective implementation of the curriculum.
- 4. The government must dedicatedly root out the culture of corruption in the education sector. Corruption is like a locust; once it invades a system, it paralyzes and renders the system dysfunctional.
- 5. Lastly, teachers must be constantly trained and retrained on the technicalities of curriculum implementation.

# Conclusion

The position of this paper, in a nutshell, is not that Nigeria has a perfect curriculum, but that if we effectively implement what we have, it can give us what we need. The burden of effective curriculum implementation lies on government at all levels – although all hands must be on deck for the government to succeed. The authors' position is that if everyone that has a role to play in the implementation of our various curricula does such with all sense of commitment and patriotism, what we have can take us to the El Dorado.
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#### EFFECTS OF CONCEPT MAPPING ON SECONDARY SCHOOLS STUDENTS' PERFORMANCE AND RETENTION IN PHYSICS IN AKWA IBOM STATE. NIGERIA

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## Abstract

The study determined the effects of concept mapping on secondary schools students' performance and retention in Physics in Ikot Ekpene Education Zone of Akwa Ibom State, Nigeria. The research design adopted for the study was quasi-experimental using pretestposttest control group design with two intact class groups. The population of the study consisted of 21,569 Senior Secondary two (SS II) students in the 85 public secondary schools in Ikot Ekpene Education Zone of Akwa Ibom State. A sample of 127 students from two intact classes in two school, was used for the study through purposive sampling technique. The instrument used in gathering data for the study was Physics Achievement Test on Motion (PATM). The instrument was subjected to face and content validation by experts. A reliability coefficient 0.81 was obtained using test re-test method. Of the two intact classes used for the study, one was taught using concept mapping strategy while the other was taught using expository strategy. Data gathered in this study were analysed using mean and standard deviation to answer the research questions, and Analysis of Covariance using pre-test scores as covariates, to test the hypotheses. From the results obtained, there was a significant difference in students' performance towards Physics when taught using concept mapping and expository strategies, in favour of concept mapping strategy; and a non-significant difference in students' retention in Physics when taught using the strategies. It is therefore concluded that concept mapping strategy is more effective than expository strategy in enhancing students' performance in Physics. Based on the findings, it is recommended among others that, teachers should strive to use the concept mapping instructional strategy frequently in teaching Physics.

Keywords: Concept Mapping Strategy, Expository Strategy, Retention, Students' Performance.

#### **Background of the Study**

The study of Physics in secondary schools is essential. It is to build knowledge, basic skills, attitudes and competencies necessary for human resource needed for socio-economic development. Physics is an important subject in the secondary school curriculum because it helps the learner apply the principles, knowledge and skills in the construction of appropriate scientific devices out of available resources. Physics is a key discipline in producing qualified engineers, scientists, teachers and researchers who play major roles in the technological and

industrial development of many countries (Mirko, Dusanka & Mirjana, 2012). The study of Physics helps individuals to understand and explain the various forces of nature and the laws governing them; for example, gravity, motion, and others. This calls for appropriate utilization of instructional strategies to facilitate the teaching and learning process.

Instructional strategies need to be participatory for all the domains of educational measures if the students are to be engaged in learning (Muindi, 2008). Adesoji and Ibraheem (2009) are of the opinion that the teaching method adopted by the teacher in order to promote learning is of uppermost importance; hence, they concluded that there was need to introduce, adopt and adapt varied and latest instructional techniques that are capable of sustaining the interest of the learners. The level of cognitive engagement and attitude of students is affected by the teacher controlling almost all activities, assigning a passive role to the students (Hanrahan, 2008).According to Alebiosu (2006), instructional strategies and teaching methods are important determinants of performance in sciences. One of such strategies is the concept mapping instructional strategy.

Concept mapping relates to a meaningful learning theory whose advantage lies in the fact that learning new bodies of knowledge remains dependent on what is already known. It upholds that new bodies of knowledge gains meaning by carefully relating it to a framework of existing knowledge rather than being processed and stored in isolation. Meaningful learning occurs when learners can connect new knowledge to something they already know (Zaitoon, 2001). Perspectives by cognitive psychologists and the philosophers of science on cognition, view learning to be an active internal process of construction by which the learners' prior knowledge plays the significant role of promoting conceptual learning (Ausubel, 1963).

The hierarchical attribute of a concept map makes learning to proceed more meaningful and easily. The new concepts meanings are subsumed into broader and more inclusive concepts (Novak and Canas, 2006).Therefore, Concept maps are diagrammatic representations which show meaningful relationships between concepts in the form of propositions. They are graphical tools for organizing and representing knowledge. Awofolaju (2006) and Aiyede (2008) asserted that students who were subjected to the concept mapping instructional strategy were able to retain the concept in Mathematics more than those students who were taught using the conventional approach.

Concept mapping is therefore a type of knowledge representation with structural knowledge seen to separate types of knowledge. The reason being that structural knowledge provides the conceptual basis for the "why". It describes how prior knowledge is interconnected with contemporary knowledge. Structural knowledge is most often depicted in terms of some sort of concept map that visually describes the relationships between ideas in a knowledge domain. Representing knowledge in the visual format of a concept map allows one to gain an overview of the domain of knowledge. This is because the nodes contain only a keyword or a short sentence, where more interpretation is required of the reader; so this may be positive (Akeju, Rotimi, & Kenni, 2011).

Concept mapping is one strategy that can be employed to develop and improve teaching in Physics. It is a tool for assisting and enhancing deep learning. A concept map is a special diagram for exploring a body of knowledge, by gathering and sharing information about it. It consists of nodes or cells that contain a concept, item or question and links. The concept map

can help the teacher establish whether or not the students understand the concepts that link the various pieces of information together. The concept map also helps students know what they have learned and what they still do not understand or achieved (Akeju, Rotimi, & Kenni, 2011).

The full involvement of students in the learning process could be achieved through active rather than passive learning approaches. Active learning directly involves students directly in the learning process. Moreover, it has been found that many teachers in Nigeria still use insufficient and teacher-centered methods in teaching science and students show low performance towards the subject (Soong, 2010). The poor performance and retention in Physics can be attributed to poor teaching methods by science teachers.

Retention involves the ability to remember facts or ideas gathered in the past. It is the act of retaining what has been learned. So, it demonstrates the ability of the learner to recall or recognize what has been learned or experienced (Rundell, 2007). Apparently, Savage and Sterry (2003) have shared in the above view by maintaining that retention is the learning that lasts beyond the initial unit or lesson and that it is assessed with the test administered two or more weeks after the information had been taught and tested. This implies that a learner who repeats an acquired piece of knowledge with less error is said to have retained the materials taught. This can be made possible by the use of appropriate strategies.

Emphasis has shifted from the expository strategy that is more of teacher-centered which encourages primarily rote memorization of facts to strategies that are more learner-centered involving hands-on science activities. In view of this, the concept mapping method of instruction is the method that allows for mastery and retention of learnt materials (Landu, 2003). Wushishi, Danjuma and Usma (2013), investigated the effect of two modes of concept mapping instructional strategies on secondary school students' retention level in mathematics in Niger State. The findings obtained showed that there was a significant difference in the retention level of the experimental group and the control group. Luchembe, Chinyama and Jumbe (2014) conducted a study to show the effectiveness of concept mapping as a teaching strategy among undergraduate students taking an introductory Physics course. The findings of the study revealed that concept mapping was more effective than the tutorial sheet strategy. Similarly, Karakuyu (2010) conducted a study aimed at investigating the effect of concept mapping on students' Physics achievement, and the results also showed that concept mapping instruction in improving the Physics achievement of participating students.

This study is therefore necessitated by the absence of indigenous studies, especially those using concept mapping strategy in enhancing retention in Physics. This study is meant to determine the effects of concept mapping on students' academic achievement and retention in physics in secondary schools in Akwa Ibom State.

## **Statement of the Problem**

It has been observed that traditional teaching methods are not able to sustain the development of students in Physics, especially at secondary school levels of education. So despite the crucial role Physics plays in technology, the performance of students in Physics at the level of secondary school in Nigeria is still below average. The neglect of students-centered learning have been identified as the major reason for the problem associated with students' performance and retention in learning Physics in secondary school science education.

The teachers' preferred way of teaching without ensuring active participation of the learners in teaching and learning process is worrisome. However, representing knowledge in visual form of a concept map allows the students to gain overview of the domain of learning which may improve performance and retention. The question therefore is: Could concept mapping strategy improve students' performance and retention in physics?

# **Purpose of the Study**

The purpose of this study was to investigate the effects of concept mapping on students' academic performance and retention in physics in secondary schools. Specifically, the study was aimed at the following objectives:

- 1. To determine the difference in students' performance in Physics when taught using concept mapping instructional strategy and those taught using the expository strategy.
- 2. To ascertain the difference in students' retention in Physics when taught using concept mapping instructional strategy and those taught using the expository strategy.

# **Research Questions**

The following research questions were raised to guide the study.

- 1. What is the difference in students' performance in Physics when taught using concept mapping instructional strategy and when taught using the expository strategy?
- 2. What is the difference in students' retention in Physics when taught using concept mapping instructional strategy and when taught using the expository strategy?

# Hypotheses

Two null hypotheses postulated and tested at 0.05 level of significance were:

- 1. There is no significant difference in students' performance in Physics when taught using concept mapping instructional strategy and when taught using the expository strategy.
- 2. There is no significant difference in students' retention in Physics when taught using concept mapping instructional strategy and when taught using the expository strategy.

## **Research Method**

The research design used for the study was quasi-experimental using pretest-posttest control group design. The study was conducted in Ikot Ekpene Education Zone of Akwa Ibom State. The Zone is located in the North Western part of the State. Ikot Ekpene is located between latitudes  $5^{\circ}$  10` and  $5^{\circ}$  30` North and longitudes  $7^{\circ}$  30` and  $7^{\circ}$  45` East.

The population for the study consisted of the entire 21,569 Senior Secondary two (SS II) Physics students in the 85 public secondary schools in Ikot Ekpene Education Zone of Akwa Ibom. A sample of 127 senior secondary two (SS II) Physics students from two intact classes of two schools was selected from the population through a purposive sampling technique for the study, based on criteria of schools with at least two graduate Physics teachers and a functional laboratory. A researcher-developed instrument titled Physics Achievement Test on Motion (PATM) was used in gathering data. The face and the content validity of the instruments were carried out, and the reliability coefficient (0.81) of the instrument was determined using test-retest method.

Two lesson plans containing the same concepts and objectives were used. They differ in approach with respect to the experimental and control groups. Simple Harmonic Motion (SHM) were treated within four weeks. The two groups were taught differently using concept mapping strategy and expository strategy. The periods lasted for 480 minutes, where 40 minutes were used for each lesson and a total of 12 lessons were treated. After one week, PATM (a post-test form) was given. To establish the extent of students' retention of the materials learnt, the PATM was re-administered to the same set of students after three weeks. The scores were recorded and compared. Mean, standard deviation were used to answer the research questions while Analysis of Covariance was used to test the null hypotheses at 0.05 alpha level of significance.

## Results

**Research Question 1:** What is the difference in students' performance in Physics when taught using concept mapping instructional strategy and when taught using the expository strategy?

# Table 1: Mean and standard deviation of performance in Physics when taught using<br/>concept mapping strategy and expository instructional strategy (N=127)

Strategy		_ Prete	st	Post-tes	Mean	
	Ν	Χ	SD	X	SD	Difference
Concept Mapping	62	47.30	9.78	62.94	10.21	15.64
Expository	65	45.04	8.59	55.51	8.94	10.47

Table 1 shows that those taught using concept mapping instructional strategy had mean scores of 47.30and 62.94 in the pre-test and the post-test, respectively. These give a mean difference of 15.64. The students taught using expository strategy had scores of 45.04and 55.51in pretest and post-test respectively, thereby earning a mean difference of 10.47. A comparison of these differences shows that those taught using expository strategy, with a mean difference of 10.47. This indicates that those taught using concept mapping strategy performed better in Physics than those taught using expository strategy.

**Research Question 2:** What is the difference in students' retention in Physics when taught using concept mapping instructional strategy and when taught using the expository strategy?

Table 2: Mean and standard deviation of students' retention in Physics when taught<br/>using concept mapping instructional strategy and expository strategy<br/>(N=127)

Group		Post-	test	Retention	n	Mean	
	Ν	X	SD	X	SD	Difference	
Concept Mapping	62	62.94	10.21	69.84	7.93	6.90	
Expository	65	55.51	8.94	61.92	8.25	6.41	

Table 2 shows that those students taught using the concept mapping strategy had mean scores of 62.94 and 69.84 in post-test and retention test, respectively. These give a mean difference of 6.90. The students taught using the expository strategy had scores of 55.51 and 61.92 in post-test and retention test respectively, thereby producing a mean difference of 6.41. Comparing these mean differences shows that students taught using concept mapping strategy had a slightly higher mean difference (6.90) than those taught using the expository strategy. This implies that students taught using concept mapping strategy retained what they had learned better than students taught using expository strategy.

**Hypothesis 1:** There is no significant difference in students' achievement in Physics when taught using concept mapping instructional strategy and when taught using the expository strategy.

Source	Sum of squares	Df	Mean	F-cal	F-crit	Decision at P<0.05
Corrected model	8609.61 <sup>a</sup>	2	4304.80	115.66	3.07	
Pretest	6858.87	1	6858.78	184.28		
Main effect	3496.63	1	3496.63	93.95		
Strategy	735.58	1	735.58	19.76		*
Error	4615.11	124	37.22			
Total	457320.00	127				
Corrected Total	13224.72	126				

# Table 3: Analysis of Covariance (ANCOVA) summary of performance in Physics when taught using concept mapping and expository instructional strategies

\*=significant at .05 alpha level.

a. R Squared = .651 (Adjusted R Squared = .645)

Results in Table 3 show that the main effect is significant at 0.05 alpha level because, the calculated F-value of 19.76 is greater than the critical F-value of 3.07 with 2 and 124 degrees of freedom. Therefore, the null hypothesis which stated that, there is no significant difference

in students' achievement in Physics when taught using concept mapping instructional strategy and expository strategy is rejected. Hence, the alternate hypothesis which states that, there is significant difference in students' achievement in Physics when taught using concept mapping instructional strategy and expository strategy is retained. Also, Table 3 further shows a multiple regression squared index (R) of 0.651 and adjusted R squared index (R) of 0.645. This implies that 65.1 percent of the total variance in the achievement of students in Physics is attributable to the influence of the treatment, that is, the instructional strategy used in teaching the students.

Hypothesis 2: There is no significant difference in students' retention in Physics when taught using concept mapping instructional strategy and when taught using the expository strategy.

Physic strateg	s when taugl gies	nt using	concept ma	pping and	expository	<sup>r</sup> instructional
Source	Sum of squares	df	Mean	F-cal.	F-crit.	Decision at P<0.05
Corrected model	82.61 <sup>a</sup>	2	41.30	.66	3.07	
Posttest	45.29	1	45.29	.72		
Main effect	12125.81	1	12125.81	193.62		
Strategy	66.23	1	66.23	1.06		NS
Error	7765.71	124	62.63			
Total	550943.00	127				
Corrected Total	7848.32	126				

Table 4:	Analysis of Covariance (ANCOVA) summary of students' retention in
	Physics when taught using concept mapping and expository instructional
	strategies

NS=significant at p<.05 alpha level.

a. R Squared = .011 (Adjusted R Squared = -.005)

Results in Table 4 show the main effect to be significant at 0.05 alpha level, since the calculated F-value of 1.06 is less than the critical F-value of 3.07 at 2 and 124 degrees of freedom. Hence, the null hypothesis which states that there is no significant difference in students' retention in Physics when taught using concept mapping instructional strategy and expository strategy is retained. Table 4 result further indicates a multiple regression squared index (R) of .011 and adjusted squared index (R) of -.005. This means that 1.1 percent of the total variance of students' students' retention in Physics is attributable to the influence of strategies.

## **Discussion of the Findings**

The findings of this study for hypothesis 1 showed a significant difference in students' performance in Physics when taught using concept mapping instructional strategy and expository strategy. Students exposed to concept mapping instructional strategy performed better than students exposed to expository strategy in their posttest performance scores. The

performance of students taught using concept mapping strategy could be attributed to the fact that students were allowed to interact among themselves, share knowledge and graphical structure of some facts and ideas in each step before moving to another.

This could further be explained by the fact that concept mapping strategy provided information on relationships or describing connections between concepts with special diagram to explore knowledge, by gathering and sharing information. Students could observe that ideas presented were linked by words which resulted to deeper understanding of the concepts. This explained the impact of interconnectedness of concepts and ideas using concept mapping strategy over the expository strategy. Also, it described how prior knowledge was interconnected through using concept mapping strategy as a tool for assisting and enhancing deep learning. The result of this study was in agreement with the earlier findings by Akeju, Rotimi, & Kenni (2011).

The result of the investigation of hypothesis 2 showed a non-significant difference in students' retention in Physics when taught using the concept mapping instructional strategy and the expository strategy. However, students exposed to the concept mapping instructional strategy performed better than students exposed to the expository strategy both in posttest and retention test. This explained that retention depended on the depth of understanding and impression created during the teaching learning process. The Concept mapping instructional strategy provided graphical images of the concepts and this could be said to have stuck to the students' memory, thus ensuring deeper understanding and enhancing retention of the concepts learnt. Students taught with expository strategy had the benefit of learning and understanding in a traditional way. This resulted to a slight mean difference which led to a non-significant difference in students' retention ability.

The finding of the study were at variance with earlier research conducted by Awofolaju (2006) and Aiyede (2008) which stated that students who were subjected to the concept mapping instructional strategy were able to retain the concept taught more than those students who were taught using the conventional approach.

# Conclusion

Based on the findings of this study, it was concluded that concept mapping teaching strategy was more effective than the expository strategy in enhancing students learning of Physics concepts.

# Recommendations

Based on the conclusions reached, the following recommendations were made:

- 1. Teacher should strive to use the concept mapping instructional strategy frequently in teaching Physics.
- 2. Seminars and workshops should be organized for Physics teachers on the use of concept mapping strategy in teaching simple harmonic motion in Physics.
- 3. Physics teachers should be dynamic in their approach to knowledge and skills acquisition and their utilization of varied instructional strategies in teaching process.

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#### ADMINISTRATIVE STRATEGIES FOR MOTIVATING SENIOR SECONDARY SCHOOL STUDENTS TO KEY INTO WATERMELON (CITRULLUS LANATUS) PRODUCTION AS ENTREPRENEURIAL VENTURE IN ABIA STATE

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#### Abstract

The study identified administrative strategies for motivating senior secondary school agricultural science students to key into watermelon production as entrepreneurial venture in Abia State. The study was guided by two specific objectives with corresponding research questions and hypotheses. It adopted descriptive survey design. The population of the study was 812 persons, made up of 267 principals and 545 teachers of agricultural science in all the 267 public senior secondary schools. The sample size for the study was 268 (made up of 86 school principals and 182 agricultural science teachers). Proportionate sampling technique was used to select the sample size. A structured questionnaire titled: 'Administrative Motivation Strategies for Students Questionnaire (AMSSQ)', validated by three experts was used as instrument for data collection. The reliability of the instrument was determined as .82 using Cronbach Alpha reliability coefficient test. Descriptive statistics of mean and standard deviation were used to analyze the data collected from the study, while ttest was used to test the hypotheses at 0.05 level of significance. The study identified 9 reasons, and 13 administrative strategies for motivating senior secondary school agricultural science students to key into watermelon production in Abia State. Thus, the researchers recommended that school administrators and agricultural science teachers should adopt the administrative strategies identified by the study to motivate the senior secondary school agricultural science students to key into watermelon production as entrepreneurial venture in Abia State among others.

Keywords: Administrative, Administrative Strategies, Entrepreneurial, Motivation.

# Introduction

A good administrator is one who enables the group of individuals to achieve its objectives with a minimum expenditure of resources and efforts. According to Okoro cited in Amadi (2016), an administrator who is planning for a programme should be fully convinced that the programme will provide employment to the students in the occupations for which they were trained. The training programme will fully satisfy the needs of the industry and business for efficient and skilled workers. Therefore, agricultural industry or farm business needs well trained farmers for it to thrive. To achieve that, there should be proper administration of the school activities, organization, direction and control of students to ensure that things are done effectively and efficiently to accomplish educational objectives (Asogwa, Onah & Gideom, 2020).

The word administration according to Hornby (2010) is the process or act of organizing the way that something is done. According to Amadi (2016), administration is defined as the guidance, leadership and control of effort of individuals in an organization towards the achievement of the organizational goal. It is the ability to mobilize human and material resources towards achievement of organizational goals. An administrator on the other hand, is a person whose job is to manage and organize public affairs of an institution. Longman dictionary and contemporary English (2009) defined an administrator as someone whose job involves managing the work of a company or organization. However, the word administrative is connected with organizing the work of an institution or company. Longman Dictionary of contemporary English (2009) also noted that administrative relates to the work of managing a company or organization. It is related to administration and synonymous to management. Administrative is the duty assumed in conducting of any office, rendering of service or conducting of affairs.

Administrative strategies are methods or ways of managing, organizing, and controlling of human and material resources towards the achievement of organizational goal. In the view of Omemu (2017), administrative strategy means shaping a group of people in the right path toward achieving a particular goal. These strategies or ways to be used in administration according to Asogwa et *al* (2020) are ensuring good administrator-students relationship, encouraging good teacher-student relationship, encouraging good social relationship among students, ensuring conducive classroom and good school environment for learning, and provision of adequate learning facilities to meet the stated objectives among others. The goal should be to train the students to become entrepreneurs, employers' of labour, and not job seekers. According to Ugboaja (2016), the word 'entrepreneurial' has to do with the translation of ideas, willingness and ability into practical terms. The ability, skill and knowledge of the entrepreneur is crucial to the survival of a business.

Therefore, the extent of accomplished objectives in education will likely depend on the level of motivation the students received from the school administrators and the teachers. According to Asogwa *et al*, (2020) motivation helps to energize, direct and sustain positive behavior of students over a very long time. Asogwa (2016) opined that motivation is a feeling of enthusiasm, interest or commitment that makes one wishing to do a particular job or task. It is one of the major factors that drives and keeps one in a particular occupation. Ezeji (2001) observed that many people are afraid of what they can do or may not know their true potentials unless they are motivated or encourage by others. Asogwa (2016) maintained that some students have the abilities, aptitude, interest and values for a particular occupation but lack the motivation to choose and enter it.

This means that the students need to be motivated to make a good occupational choice while in school. They should be motivated and trained to acquire the technical skills (Eje, Kalu & Aja, 2017), employability skills (Ibe & Aja, 2017), and technical vocational education and training skills (Ibe & Aja,2019) required in the world of work. According to Asogwa*et al*, (2020) students' motivation to learning is predominantly stimulated through modeling, direct instruction, effective communication with the teachers and with the school management and rewards of students' excellent performance among others. Bosompem, Kwarteng and Obeng-Mensah (2012) in their view, stated that the agricultural science teachers in secondary schools should train, stimulate and motivate the students who are the potential agriculturist and policy makers of the nation to effectively boost the food production of the nation. School administrator and teachers should encourage the students to choose occupation that fits the students' abilities, interest, aptitude, and values by assisting students to understand their strength, weakness and other vital characteristics that facilitates occupational choice.

Crop production is a career choice in agriculture which has its focus on food crop production. Food is any edible material that supports growth, repair and maintenance of the body. It includes protein, carbohydrates, vitamins, fat and oil, and minerals. According to Elechi, Ibe and Adeolu (2009), food, shelter and clothing have been the basic needs of man throughout the history. They maintained that meat which is animal protein is very expensive and as a result many families cannot afford to buy a meat or boast of taking meat regularly. However, to meet their protein requirements and provide food on the table, Elechi*etal*, (2009) noted that people have used crop resources to provide for these needs and improve their standard of living. Also, the need for vegetables which are quick-maturing crops and as a means of increasing protein supply comes to lime light.

Vegetables are essential in human diet. Agricultural Marketing Resource Center (2021) and Elechi *et al*, (2009) opined that the term vegetable refers to any plant cultivated for its edible parts. Some vegetable contain useful amount of protein, little fat and varying proportions of vitamins, dietary mineral and carbohydrates. In agreement to this, Omeje cited in Elechi *et al* (2009) affirmed that vegetable serves as complete food supplying protein, vitamins (A, B, C, D, E, K), minerals, fats and oil, carbohydrates and plenty of water to the diet. They further stated that vegetables are divided into leaf vegetables, fruit vegetables, seed vegetables and root vegetables.

Watermelon (*Citruluslanatus*) falls into fruit vegetable (Ayres, 2021). It is a part of cucurbitaceae family and originates from Africa (Zambia Agribusiness Society, 2021). Zambia Agribusiness Society maintained that nutritionally, watermelon is a sweet and delicious vegetable eaten as fruit, use in fruit salads or as deserts. It contains vitamins A,  $B_6$  and C, and a significant measure of lycopene which is a naturally occurring chemical that gives the fruit a red colour, and a photonutrient. Agricultural Marketing Resource Center (2021) opined that watermelon gets its name because of its extremely high water content, approximately 92 percent. Beside water, it is full of nutrients; 1 cup of diced, fresh watermelon provides 21 percent of the daily value (DV) for vitamin C, 18 percent of the DV for vitamin A, and significant levels of vitamin B6, antioxidants, and amino acids. Medicinally, it is good for heart, bone and prostrate health. The antioxidants in watermelon maintain the body's cells and protect them against cancer. It is fat-free and low in calories. According to the Zambia Agribusiness society (2021), it is about 92% water which makes the eating of the fruit a great way to hydrate the body. Economically, Adeoye, Olajide-Taiwo, Adebisi-Adelani, Usman, and Badmus (2011) affirmed that the crop is a very good source of

income because of its high demand for consumption. In terms of cultivation, it is easy to cultivate and can be grown on a wide range of soil type, which according to Zambia Agribusiness Society (2021), this makes its cultivation suitable to almost all the soil type though sandy soils are preferred. According to the report of United States Development Agency (USDA) cited in Oyewole, Olujide and Oyedeji (2015), watermelon requires little startup, can easily be cultivated, has very short growth cycle and there is readily available market for it. Watermelon production seems to be a tool for reduction of unemployment. Though, Ibe and Aja (2017) had reported a large number of unemployed graduates. Oyewole *et al* (2015) stated that watermelon production seems to be an option towards reducing unemployment among the secondary school leavers or graduates.

# Statement of the Problem

A lot of reasons abound for people to key into watermelon production. Watermelon requires little startup, can easily be cultivated, has very short growth cycle and there is readily available market for it. The crop is a very good source of income because of its high demand for consumption. However, it is evident from the foregoing that watermelon needs to be produced on large scale to meet the demand of the people of Abia State and Nigeria at large, as well as reduce unemployment. Watermelon production seems to be an option towards reducing unemployment among the secondary school leavers or graduates.

Despite all the benefits of watermelon noted, it has been observed that most of the watermelons consumed in the Abia State are bought from the Northern part of the country. Secondly, a large number of secondary school graduates are unemployed. It seems that students while in schools were not properly motivated to key into entrepreneurial ventures. More so, past studies have not addressed the strategies for motivating the senior secondary school students rather, efforts were made at identifying the technical skills, employability skills, and technical vocational education and training skills.

Hence, it become imperative to carry out a study on administrative strategies for motivating senior secondary school agricultural science students to key into watermelon production as entrepreneurial venture in Abia State.

# **Purpose of the Study**

The purpose of the study was to determine the administrative strategies for motivating senior secondary school students to key into watermelon production as entrepreneurial venture in Abia State. The following specific research objectives were stated to guide the study.

- 1. Identify reasons for motivating senior secondary school agricultural science students to key into watermelon production as entrepreneurial venture.
- 2. Find out ways in which school principal and teachers can motivate senior secondary school agricultural science students to key into watermelon production as entrepreneurial venture.

## **Research Questions**

The following research questions were raised in line with the objectives to guide the study.

- 1. What are the reasons for motivating senior secondary school agricultural science students to key into watermelon production?
- 2. What are the ways in which school principal and teachers can motivate senior secondary school agricultural science students to key into watermelon production?

# Hypotheses

- **Ho**<sub>1</sub>: There is no significant difference between the mean responses of school principal and teachers of agricultural science on reasons for motivating senior secondary school agricultural science students to key into watermelon production.
- **Ho<sub>2</sub>:** There is no significant difference between the mean responses of school principal and teachers of agricultural science on ways in which school principal and teachers can motivate senior secondary school agricultural science students to key into watermelon production.

# **Research Methodology**

The study adopted a survey research design. The area of the study was Abia State. Abia State is located in Southeast part of Nigeria between the latitudes 5°25'N and longitudes 7° 30'E. It is made up of three senatorial zones namely Abia North, Abia Central and Abia South. There are three main agricultural zones in Abia State which in turn form the educational zones and they include Ohafia zone (Abia North), Umuahia zone (Abia Central), and Aba zone (Abia South). The state has many senior secondary schools offering agricultural science in which the researchers used for the study. The population of the study was 812 persons made up of 267 principals in all the 267 public senior secondary schools and 545 teachers of agricultural science in Abia State (Secondary Education Management Board, SEMB, 2021). The sample size was 268comprised of 86 school principals and 182 teachers. Proportionate sampling technique was used for the study to select the 86 school principals and 182 teachers of agricultural science based on the population of each sub-group in the entire population. The instrument used for data collection was structured questionnaire titled Administrative Motivation Strategies for Students Questionnaire (AMSSQ). The questionnaire had four point response options of strongly Agreed, Agreed, Disagreed, and Strongly Disagreed with corresponding numerical values of 4, 3, 2, and 1 respectively. The instrument was face validated by three (3) validators. Cronbach alpha statistic was used to test the reliability of the instrument which vielded a reliability coefficient of 0.82. Three (3) research assistants were trained by the researcher to help administer and retrieve the instrument. The questionnaire were administered and collected at the spot, so all the 268 questionnaire were retrieved (100% return). Data collected from the respondents were analyzed using descriptive statistics of mean and standard deviation. Hypotheses were tested at 0.05 level of significance using Independent Sample t-test. Decision rules were based on the following; mean scores  $\geq 2.5$ (average on 4-point scales) were described as "Agreed" while mean scores <2.5 (average on 4-point scale) were described as "Disagreed". Also, t-calculated values less than  $\pm$  1.97 were taken as non-significant (NS).

# Results

The results for the study are presented in the tables below.

**Research Question 1:** What are the reasons for motivating senior secondary school agricultural science students to key into watermelon production in Abia State?

**Ho<sub>1</sub>:** There is significant difference between the mean responses of school principal and teachers of agricultural science on strategies for motivating senior secondary school agricultural science students to key into watermelon production as entrepreneurial venture in Abia State.

Data for answering research question 1 and testing hypothesis 1 are presented in Table 1 below.

Table 1: Descriptive Statistics and p-values on reasons for motivating senior<br/>secondary school agricultural science students to key into watermelon<br/>production in Abia State (n = 268)

S/N	Item statement	$\overline{X}_1$	$\overline{X}_2$	$SD_1$	SD <sub>2</sub>	Sig.	Remarks
1.	Watermelon required little starting	3.29	3.18	.47	.56	.94	A, NS
	capital						
2.	Watermelon can easily be cultivated	2.86	3.21	.33	.54	.69	A, NS
3.	Has short growth cycle	3.65	3.38	.64	.63	.67	A, NS
4.	Its cultivation reduces	3.31	2.94	.48	.63	.31	A, NS
	unemployment						
5.	Increases the production force of	3.10	3.14	.40	.62	.24	A, NS
	the State						
6.	High demand of watermelon	3.30	3.34	.47	.48	.42	A, NS
7.	Source of income	3.14	2.94	.41	.52	.40	A, NS
8.	High nutritional value	3.30	2.89	.47	.48	.42	A, NS
9.	Highly medicinal crop	3.27	3.12	.29	.61	.32	A, NS

 $\overline{X}_1$ = mean of the school principal,  $\overline{X}_2$ = mean of the agricultural science teachers,  $SD_1$  = Standard deviation of the school principal,  $SD_2$  = standard deviation of the agricultural science teachers, n = number of respondents, t-cal is significant at 0.05 (± 1.97), df = 266, A = Agreed, NS = Not significant.

Data in Table 1 revealed that all the 9 items had their mean values for the school principals ranging from 2.86 to 3.65 while agricultural science teachers mean values ranges from 2.89 to 3.38 and were above the 2.50 cut-off point of the 4 point scale. This means that the respondents agreed that the information represented by all the items are reasons for motivating senior secondary school students to key into watermelon production. The standard deviation of all the items ranged from .29 to .64 for the school principal and from .48 to .63 for agricultural science teachers, which showed that the respondents were not too far from the mean and to the opinion of one another in their responses. The table also showed that t-calculated values of all the items which ranged from .24 to .94 are greater than .05 level of significance. This implied that there was no significant difference between the mean responses of both school principal and teachers of agricultural science on reasons for motivating senior secondary school agricultural science students to key into watermelon production. Therefore, the hypothesis of no significant difference between the mean responses of school principals and teachers of agricultural science on reasons for motivating senior secondary school agricultural science on reasons for motivating senior secondary school agricultural science on reasons for motivating senior secondary school agricultural science on reasons for motivating senior secondary school agricultural science on reasons for motivating senior secondary school agricultural science on reasons for motivating senior secondary school agricultural science on reasons for motivating senior secondary school agricultural science on reasons for motivating senior secondary school agricultural science on reasons for motivating senior school principals and teachers of agricultural science on reasons for motivating senior school principals and teachers of agricultural science on reasons for motivating science school principals and teachers of

senior secondary school agricultural science students to key into watermelon production was not rejected.

**Research Question 2:** What are the administrative strategies for motivating senior secondary school agricultural science students to key into watermelon production in Abia State?

**Ho<sub>2</sub>:** There is no significant difference between the mean responses of school principals and teacher of agricultural science on the administrative strategies for motivating senior secondary school agricultural science to key into watermelon production in Abia State.

Data for answering research question 2 and testing hypothesis 2 are presented in Table 2 below.

Table 2:	Descripti	ve St	atistics and	d p-valu	es on ways	in whicł	n school princ	ipal and
	teachers	can	motivate	senior	secondary	school	agricultural	science
	students	to key	y into wate	rmelon	production i	in Abia	State.	

S/N	Item Statement	$\overline{X}_1$	$\overline{X}_2$	$SD_1$	$SD_2$	Sig	Remarks
1.	Encouraging good teacher-student	3.35	3.32	.56	.48	.43	A, NS
	relationship						
2.	Ensuring good administrator-student	3.09	3.25	.40	.45	.33	A, NS
	relationship						
3.	Ensuring good school environment for	3.02	2.90	.38	.35	.88	A, NS
	learning						
4.	Encouraging good social relationship among	3.26	3.21	.26	.44	.14	A, NS
	students.						
5.	Rewarding excellent students for their	3.14	3.10	.41	.60	.24	A, NS
	academic performances						
6.	Developing good communication patterns	3.15	2.92	.42	.35	.80	A, NS
_	between teachers and students				•		
7.	Provision of adequate learning facilities to	3.21	3.03	.44	.38	.14	A, NS
	meet the stated objectives.		• • •			•	
8	Identifying the skills involved and methods	3.23	3.28	.46	.14	.38	A, NS
	of acquiring them	• • • •			10		
9.	Ensuring knowledge and skills acquired are	2.98	3.15	.36	.42	.41	A, NS
1.0	relevant to the needs of students			10			
10.	Ensuring good health and safety of the	3.31	3.50	.48	.56.	.36	A, NS
	students		0 - 1		~0	10	
11.	Establishing reward systems for students	3.35	3.54	.51	.58	.40	A, NS
12.	Identifying students' needs and ways of	3.40	3.48	.52	.55	.46	A, NS
	meeting them.						
13.	Integrating students in decision making	3.28	3.08	.47	.40	.47	A, NS
	process in schools						

 $\overline{X}_1$  = mean of the school principal,  $\overline{X}_2$  = mean of the agricultural scienceteachers,  $S_1$  = standard deviation of the school principal,  $S_2$  = standard deviation of the agricultural science teachers, n = number of respondents, t-cal is significant at 0.05 (± 1.92), df = 266, A = Agreed, NS = Not significant

Data in Table 2 revealed that all the 13 items had their mean values for the school principal ranging from 2.98 to 3.40 and the agricultural science teachers ranging from 2.90 to 3.54, all of which were above the 2.50 cut-off point of 4-point scale. This means that the respondents agreed that the information represented by all the items are ways in which school principal and teachers can motivate senior secondary school agricultural students to key into watermelon production. The standard deviation of all the items ranged from.26 to .56 for the school principal and from .35 to .60 for agricultural science teachers, which showed that the respondents were not too far from the mean and to the opinion of one another in their responses. The table also showed that t-calculated p-values of all the items ranged from.14 to .88, which is greater than 0.05 level of significance. This implied that there was no significant difference between the mean responses of both the school principals and teachers of agricultural science onways in which school principal and teachers can motivate senior secondary school agricultural science students to key into watermelon production. Therefore, the hypothesis of no significant difference between the mean responses of school principals and teachers of agricultural science on in which school principal and teachers can motivate senior secondary school agricultural science students to key into watermelon production was not rejected.

# **Discussion of Findings**

The findings from Table 1 showed that all the 9 items are the reasons for motivating senior secondary school agricultural science students to key into watermelon production in Abia State. Among the reasons are; it requires little start-up capital, it can easily be cultivated, it has short growth cycle, high demand, high nutritional value, and it is highly medicinal crop. This is in agreement with the report of United State Development Agency cited in Oyewole *et al*, (2001) who stated that watermelon requires little start-up capital, has very short growth cycle, can easily be cultivated and there is readily available market for it. It is also in line with Adeoye *et al*, (2011) who affirmed that the crop is a very good source of income because of its high demand for consumption.

The result of the findings in Table 2 revealed that the 13 items are the ways in which school principal and teachers can motivate senior secondary school agricultural science students to key into watermelon production in Abia State. The administrative strategies are ensuring good administrator-student relationship, encouraging good social relationship among students, ensuring conducive classroom, and good school environment for learning among others. The findings of the study in this direction were in conformity with the findings of Asogwa *et al*, (2020) that students' motivation to learning is predominantly stimulated through modeling, direct instruction, effective communication with the teachers and with the school management and reward of students' excellent performance among others. It is also in consonance with Omemu (2017) who opined that administrative strategy means shaping a group of people in the right path towards achieving a particular goal or objective.

## Conclusion

The above findings from the study showed the reasons for motivating senior secondary school agricultural science students to key into watermelon production are; watermelon production requires little startup capital, it can easily be cultivated, it has high demand, readily available market and highly medicinal among others. To adequately motivate the agricultural science students to key into watermelon production, school administrators and teachers should apply the following strategies; ensuring good administrator-students relationship, encouraging good teacher-students relationship, encouraging good social

relationship among students, ensuring conducive classroom and good school environment for learning, rewarding students' performances, developing good communication patterns between teachers and students, provision of adequate learning facilities to meet the stated objectives, identifying the skills involved and methods of acquiring them, ensuring learning and skills acquired are relevant to the needs of students, ensuring good health and safety of the students, establishing reward systems for students, identifying students' needs and ways of meeting them, and integrating students in decision making process in schools.

## Recommendations

Based on the findings of the study, the following were recommended:

- 1. School administrators and agricultural science teachers should adopt the administrative strategies identified by this study to motivate senior secondary school agricultural science students to key into watermelon as entrepreneurial venture in Abia State.
- 2. School administrators and agricultural science teachers should adopt the administrative strategies identified by this study to motivate the students of agricultural science for improved academic performance and achievement of educational objective.
- 3. Government should give special attention to these identified administrative strategies by organizing seminars and workshops to school administrators and teachers of agricultural science to keep them updated from time to time.
- 4. Government and school administrators should pay special attention to these identified reasons for motivation and therefore ensure that the senior secondary school agricultural science students are effectively motivated to key into watermelon production for benefits.
- 5. Government and school administrators should ensure adequate learning facilities and conducive learning and working environment to improve students' academic performance and fast track the productivity of watermelon in Abia State and Nigeria at large.

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#### EVIDENCE-BASED APPLICATION OF GLOBAL BEST PRACTICES IN STUDENT ENGAGEMENT AND ASSESSMENT TECHNIQUES: INSTRUMENTS FOR EXCELLENCE IN TEACHING AND LEARNING IN NIGERIA HIGHER EDUCATION INSTITUTIONS

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#### Abstract

In recent years, the societal demand on Higher Education has been for it to bring about the achievement of excellence in every sphere of life through research and innovation, in order to contribute to societal and industrial development .This quest for excellence has been extended to now focus more on teaching and learning in Higher Education. This is due to the realization and general consensus that it is from quality teaching and learning that excellence in all other sectors emanate. This paper reviews the global views and approaches to inculcating excellence in teaching and learning in Higher Education through evidence- based best practices. The efficacy and application of two such evidence-based global best practices in student engagement and effective assessment: "Lecture Chunking" and "Transparency in Learning and Teaching (TILT)" are examined. The paper also appraises the situation in Nigeria Higher Education Institutions and concludes that not only will the Nigerian Higher Education students benefit from the application of these practices there is a need and general advocacy for the up skilling of Nigerian lecturers in the application of these practices. The paper recommends that Nigeria Higher Education Institutions imbibe the global "excellence" culture in teaching and learning through research-basedtraining of faculty on internationally recognized effective teaching and learning practices; and the setting up of Centers of Excellence in Teaching and Learning within the Higher Education Institutions.

Keywords: Evidence-Based, Global Best Practices, Student Engagement, Assessment Techniques, Higher Education

#### Introduction

There is an urgent societal demand for quality manpower due to rapid and dynamic developmental changes in the world today. Nations constantly turn to Higher Education Institutions (HEIs) as a source of the desired manpower, leadership, skills, research and innovations to effect the required developmental changes. In response to these societal demand, HEIs are constantly seeking for excellence through research in the various spheres

of development; Agriculture, Health and Energy to name a few. However, the quest for excellence in HEIs is not restricted to research and innovations in these fields of knowledge and spheres of life. Achieving excellence in teaching in HEIs has been a major pursuit globally among HEIs for decades. The bid for teaching excellence by higher education institutions is as a result of the direct relationship between the quality of higher education and the quality of a country's work force. Centers of Excellence in Teaching and Learning (CETLs) are established in most HEIs globally. This trend has led to the evolution of multiplicity of dynamic teaching and learning techniques and practices that instil quality into the teaching and learning process. Theseinnovative teaching and learning practices are being researched and introduced to the teaching staff of HEIs through these CETLs. This is in effort to not only improve the quality of HEIs graduates but to also make learning and the learners in these institutions more responsive and relevant to industrial and societal needs.

Truly, the quality of the workforce in turn determines the level and potentials for national development. Realizing this, Nigeria, among the goals of its National Policy on Education on tertiary education includes the provision of "quality teaching and learning" (FRN, 2013:40). The expected outcome of this goal is creation of employable graduates who are able to apply the knowledge and skills acquired in school to the real world. To achieve this goal the Federal Republic of Nigeria has also stated that "all teachers in tertiary institutions shall be required to undergo training in the methods and techniques of teaching "(FRN, 2013: 41).

Effective and quality education lie, not only in good leadership, adequate funding, the provision of facilities but also in consistency in ensuring a workable and efficient system with appropriate curriculum that includes the instructional quality; design, delivery and assessment techniques. In line with this, the NUC in 2017 embarked on pedagogical trainings for university lecturersto equip them with current skills for effective instructional delivery (Daily Times, 2017).

There is a global trend among universities to incorporate pedagogical training into academic staff development, thus the existence of Centers of Excellence in Teaching and Learning in many universities worldwide. The need for building capacities of higher education teachers (Educational Development) has been recognized and entrenched in Higher Educational Institutions all over the world (Knapper, 2016). The pedagogical demands of 21st century Higher Education include; evidence-based teaching and assessment techniques, a knowledge of how students' learn best, High Impact Practices (HIP), student engagement practices and the integration of technology in instruction (Knapper, 2016; National Survey on Student Engagement, 2018; Nwosu, 2018 and Nwosu, 2020). These practices have been researched and are being infused into Higher Education; and arekeyinstruments of excellence in teaching and learning.

#### **Theoretical Framework**

The theoretical framework for student engagement practices and effective assessment strategies emanates from the cognitive and constructivist learning theories. Specifically the Cognitive Information Processing (CIP) theory.

## **Cognitive Information Processing (CIP) Theory**

This is not a single theory but a generic term used to describe all the perspectives that focus on cognitive processes. These include attention, perception, encoding, storage and retrieval of knowledge. The theory is based on the idea that humans process information they receive rather than respond to the stimuli. The most popular model of the CIP theory is the stage theory model – Atkinson and Shiffrin (1968). The model is shown below.



# **TheStage Theory Model of CIP Theory**

Fig. 1: The Stage Theory Model (Source: Adapted from Atkinson R. C. & Shiffirin, R. M., 1968)

The stage theory model (Atkinson &Shiffrin, 1968) views memory information storage in three stages. It hypothesizes that new information is taken in, manipulated and stored. It recognizes these stages of memory; Sensory memory (SM), Short term or working memory (STM) and long term memory (LTM).

The sensory memory perceives stimuli from the environment. It acts as a portal for the senses only stimuli that are consciously perceived are stored. Information in the SM begins to decay (within0 .5- 3s)if not transferred to the next stage. These stimuli are transferred to the next stage through attention: this means to focus on a stimulus while consciously attempting to ignore other stimuli, this process is impacted by factors such as the meaningfulness of the new stimuli; the complexity of the new information; the similarity between competing ideas or stimuli and the physical ability of the learner to attend. These information can be stored in the STM through rehearsal; that is repetition of information order to commit it to memory, however if the new information is not committed to memory in a meaningful way it will not be stored. Thus rehearsal is not enough to commit information to memory (Sucharitha, Mata & Dwarakamai 2020).

The STM or working memory is the second stage of information processing. The processing of new stimulus takes place in the STM and the information is worked on in the Long-term memory (LTM). Here through rehearsals and encoding, information enters the long term memory (LTM). The retrieval process can access information from the LTM and bring it to working memory use. If learning, a relatively permanent change is to take place, new information must be transferred to long term memory.

The implications of CIP to instructions is that if the aim of instruction is learning, then information must be presented in such a way that it can be incorporated into the memory structure. Thus the need for effective teaching techniques. This accentuates the need to provide meaningful information; simple stimuli information to learners to enable transfer to LTM. When students are actively engaged with content or new material, they are able to attend tothe information and transfer to next stage of cognitive processing.

Further implications of the CIP theory to teaching and learning includes; Active Learning: Student engagement techniques means keeping the student actively involved in the learning process. The CIP model emphasizes the necessity of the learner expending cognitive effort in order for class activities to be beneficial rather than rote recall (rehearsal) of facts. These cognitive efforts include class discussions, questions, problem solving activities (Slates & Charlesworth, 2007).

The CIP model also highlights the need for meaningfulness of course materials. When information is made meaningful, it can be learned faster and retained for a longer period. This aids attention and encoding information into the long term memory. Meaningfulness occurs when students can grasp rules, generalization, relationships between facts or associate new information with the prior knowledge or experiences. This can be done by student engagement activities such as practical applications of information relevant to students' lives; assisting students in forming associations between new information and their existing knowledge; asking of questions that require generalization of material to new situations (critical thinking activities) (Slates & Charles Worth, 2007).

## The Cognitive Load Theory - Sweller (1988)

The cognitive load theory (CLT) is an instructional theory based on the knowledge of human cognition. It builds on the cognitive information processing theory (CIP). According to the CLT, the working memory (STM) can generally hold five to seven items (or chunks) of information at any one time. When the brain is processing information it categorizes the information and moves it into the long term memory as "schemas" (information organized according to how they are used). According to Sweller and Chandler (1991), since the working memory has limited capacity, learning experiences or instructional methods should be designed to reduce working memory load in order to promote schema acquisition.

By using the knowledge of the relationships between short term or working memory and long term memory, the theory has been able to generate instructional procedures to reduce working memory over load for effective course design and student engagement.

# **Conceptual Framework**



Fig. 2: Model of Conceptual framework (Source: Authors)

The conceptual framework model above (fig. 2) depicts the trajectory to excellence in teaching and learning. The application of global best practices in course design student engagement and assessment techniques will require research-based implementation to ascertain their workability in a country's (Nigeria) context. Effective implementation of these practices should be evident in effective teaching and learning process which is the core tenet of excellence in teaching and learning.

## **Evidence-based Global Best Practices and Teaching and Learning Excellence**

Academic excellence can be described as the accomplishment of the learning process; gaining subject knowledge; and developing employability skills (Nadaf, 2017). Evidencebased teaching and learning involves the use of research to establish where students are in their learning; decide on appropriate teaching strategies and interventions; and monitor student progress and evaluate teaching effectiveness. The term 'evidence-based' is now firmly entrenched in the education lexicon. An evidence based approach to teaching and learning provides a framework for teaching and learning grounded in empirical research. Teachers and students can achieve excellence within the context of evidence - based practices (Nadaf, 2017).

Several evidence-based best practices in Higher Education teaching and learning have proven to be effective in improving both teaching and learning. These evidence-based best practices in teaching and learning can be summed up into the three broad areas; effective course design, student engagement strategies and effective assessment. These spractices are usually the focus of excellence driven pedagogy.

# **Effective Course Design**

According to the Cognitive Processing Theory and Cognitive Load Theory. Instructional design should be based on the premise that information be presented in such a way that it can be incorporated into the memory structure and learning materials and experiences or instructional methods be designed to reduce working memory load. Most global best practices align with these learning principles. Thus an effective course design should align clear, attainable course learning outcomes with instructional activities, course materials and assignments and assessments. The learning outcomes in turn should reflect the knowledge and abilities expected within the discipline, course, the department and wider school level (Andrson, Krathwohl, Airasian, Cruikshank, Mayer. 2001, in Sorcinelli, Borg, Bondi, & Watson, 2017). According to Public University in Indianapolis, the essential paths to teaching excellence include; the development of measurable course learning objectives that align with the course activities and assessment techniques of an excellence driven pedagogy should be incorporated in to the course design.

# **Student Engagement Strategies**

Student engagement has been described by the American National Survey on Student Engagement (NSSE) (2018) as representing two critical features of academic quality; firstly, the amount of time and effort students put in their studies and other educationally purposeful activities and secondly, how faculty and institutions deploy resources and organizes the curriculum and other learning opportunities to get students to participate in activities that research have shown are linked to learning (NSSE, 2018).

The CIP theory has prescribed a need for the learner to expending cognitive effort such as: discussions, questions, problem solving activities (Slates &Charlesworth, 2007) in order for class activities to be beneficial. A key indicator of effective student engagement is good student learning experiences. The characteristics of good learning experiences have been listed by Kurzweil and Marcellas (2019) and are related to instructional techniques that have substantial research support behind them. These instructional techniques include: Problem Based Learning, Collaborative Learning, Small Group Discussion, Authentic Tasks and Events (Learning activities or projects tied to current events and/or include real life interdisciplinary learning and reflective teaching strategies and experiences for students.

CIP also prescribesneed for meaningfulness of course materials accordingly when information is made meaningful, it can be learned faster and retained for a longer period. This is in line with the NSSE (2018) student engagement indicators of; higher –order learning, reflective and integrative learning, collaborative learning discussions with diverse others, student –faculty interaction. Higher student engagement are associated with instructional methods involving active learning (Lynch, 2016). Active learning is the major attribute of student engagement and is described as anything students do during a class session other than passively listening to lecture (Costal Carolina Community College (CCCC), 2020). Learning environments are more effective when they encourage intentional cognitive processing for learners and guiding them in constructing meaningful relationships between ideas instead of passively recording information (CCCC, 2020). Although educators are continuously being encouraged to integrate active learning strategies into their teaching for decades, lecturing and textbook reading have remained the norm. The lecturing approach

does not afford students the opportunity to engage in the types of active/cognitive processing required to create a lasting transfer of knowledge acquired (Lynch, 2016). This in turn results in passivity in learning during independent studies. Several student engagement techniques lecturers integrate in their classroom have been empirically established to bring about positive learning effects. A major instructional procedure that has emanated from the Cognitive Load Theory is Lecture Chunking or the Pause procedure.

# Lecture Chunking

This is the spacing of instruction into intervals with opportunities for learners to engage in activities that engender effortful recollection of informationin order to promote long term retention and transfer (Lynch, 2016). Chunking is a cognitive processing that recodes information into meaningful groups, called chunks, to increase learning efficiency or capacity (Fountain & Doyle, 2012). Dividing the lecture content into smaller chunks of information reduces the cognitive load necessary for processing the new information and allows the teacher to explore the content more (Gaines, 2014).

The chunking theory explains how experts circumvent the limitations of cognitive processes through the acquisition of domain-specific knowledge, in small meaningful units of interconnected elements (chunks) (Gobert & Lane, 2012). Chunking is a practice of breaking up steady streams of lecture content. The practice is informed by concept of working memory which is known to hold a limited amount of space for processing information. The chunking of lecture content opens up space through breaks and pauses to accommodate the limitations of the working memory (Williamson & Schell, 2014).

Williamson & Schell (2014 and 2020) and Thalmann, Souza & Oberauer (2019) recommend that for better student's engagement, active learning and retention during lectures, content be split into a series of 15-25 minutes chunks with student engagement activities and review exercises in between the chunks during the pause time. These activities could include any of the following research-based activities.

- (i) Peer instruction in which the teacher poses a concept test (an interpolated assessment) during the pause time to gauge the class understanding. The students discusses their choice with their peers, before responding to the initial prompt.
- (ii) Ask the student short answer questions. Engaging students with question is more of value to their learning the topic. This enables a deeper coverage of key concepts which is more important than surface coverage of many concepts.
- (iii) Provide short term group activities, allow the students to work collaboratively
- (iv) Use a variety of media, show a short video. (Williamson & Schell, 2020)

The age old instructional delivery method of providing a stream of information for long periods uninterrupted is not consistent with existing knowledge about how people learn best. Splitting lectures into 15 to 20 minutes chunks improves students' retention of information (reducing load on the working memory) and subsequently students understanding of course content.(Williamson & Schell, 2014).

## **Effective Assessment**

Effective assessment, in line with the cognitive processing theory, is one which gives simple and clear instructions and avoids too much working memory over load as wellas being aligned to the learning outcome. The method of assessment can contribute largely to students' achievement in the courses they study. Research by Paunesku, Walton, Romero, Smith, Yeager & Dweck (2015) has shown that student academic confidence and sense of belonging is connected to students' greater persistence and higher grades. A recently proven method of engendering academic success through assessment is the Transparency in Learning and Teaching (TILT) technique.

# Transparency in Learning and Teaching (TILT)

Transparent teaching and Learning methods explicitly focus on how and why students are learning course content in particular ways and how they will use their learning in their lives after school. It is gaining attention for three reasons:

- It is easily adopted for faculty
- It is a small change with a large effect on students' success
- The impact is larger for undeserved students (less prepare student benefits and more prepared student benefit a little. All it is statistically significant on all student's success). (Winkelmes, Bernacki, Butler, Zochowski, Golanics, & Weavil, 2016).

Complementing university efforts to bring about student success, Transparency in Learning and Teaching (TILT) project has shown that giving transparent assignments not only improves students achievement, it also engenders more academic confidence and a sense of belonging among first year students especially those struggling with economic difficulties. A recent study in 2015 on transparency in learning and teaching in Higher Education revealed that transparency in teaching and assessment is a replicable strategy which produces benefits resulting in student's success (Winkelmes, Bernacki, Butler, Zochowski, Golanics, & Weavil, 2016).

The paradigm of transparency in learning and teaching (TILT) was founded by Mary-Ann Winkelms. She was the principal investigator in a study conducted with Ta McNair and Ashley Finely in 2014/2015 with the Association of American College and University (AACU) (Winkelms, McNair and Finely, 2016). The study revealed that the use of more transparent instruction which involved assignments that were designed to be more accessible and problem solving in nature resulted in significant gain in academic confidence, sense of belonging and awareness of their mastery of the skills that employer's value most when hiring. These benefits were greater for first-generation, low-income and underrepresented students. It was further revealed that TILT methods improved students retention in school especially in the first year when students normally drop out of school.

## **Effective Teaching and Learning**

Research in teaching and learning has generated clear understanding of what constitutes effective instructional practices. Teaching effectiveness is generally referred to in terms of the focus on student out comes and the teaching behaviours and classroom processes that promotes better student out comes.

From the above perspectives we can deduce here that effective teaching involves planning instruction, implementing instruction through the use of current research based best practices that ensure students learning and monitoring and ensuring students' progress through proper classroom management and action research. These features of effectiveness in teaching are in line with the techniques used.

The lecturers will be trained in the techniques of course planning, use of effective instructional strategy and assessment techniques as students' progress and monitoring of student's progress.

The result of effective teaching is effective learning. TheKentucky Department of Education (2020) has published characteristics of highly effective teaching and learning based on research findings as including the under listed.

- **Learning Climate:** Should be safe environment supported by the teacher with clear expectations and positive relationships fostered and active learning promoted so that students are authentically engaged.
- Classroom Assessment and Reflection: Where teacher and student collaborate together information on student learning systematically to direct instruction so that student understand what proficient work is like and determines steps for improving his/her work.
- **Instructional Rigor and Student Engagement:** Where teacher support and encourage students to commit and initiate complex inquiring based learning requiring creativity, critical thinking and problem solving. So that the student can articulates and understand learning targets and criteria for success.
- **Instructional Relevance:** The ability to facilitate learning experience that are meaningful to students so that the student is able communicate understanding of a variety of real world form of knowledge of content. The teachers' ability of exhibit understanding and application of current theories, principles so that the student can demonstrate content knowledge and use ideas in realistic problem solving situations.

McQueen and Webber(2012) reviewed students perception of what constitutes effective learning among 102 college students between the ages of 16- 21 and found that the students valued engaging in discussions as a useful meta- cognition strategy to develop characteristics of effective learning. The students also value intrinsic and extrinsic motivation and positive teacher student relationships.

# **Excellence in Teaching and Learning**

The term excellence has been defined as being exceptionally good and of superior quality (Lierse, 2018). The term excellence in higher education can mean different things in different contexts. It can reflect the reputation of the institution in terms of its mission and perceptions student experience or as a social phenomenon where it refers to quality of management and technological development. However, in terms of quality assurance variables "excellence" reflects the degree or level of quality of service provided by institutions; here it relates to the quality of teaching and research, the capabilities of students, the scale of provision of resources and level of student achievement (Saliu, 2020:6).Excellence in Teaching describes a teaching that is exceptionally good and of superior quality to others. Teaching excellence has be seen as an academic process in which students are motivated to learn in ways that make sustained, substantial and positive influences on how students think, act and feel (Schreyer Institute for Teaching Excellence, 2020).

An excellent teacher is viewed as one who contributes positively to the learning environment by possessing thorough knowledge of subject matter, guides students successfully through exploration of creative, critical thinking and problem solving processes and provides regular constructive feedback to students (Lierse, 2018). A lecturer that strives for quality and excellence should be able to provide students with varieties of learning experience that effectively elicit their critical thinking and problem solving skills through actively engaging them in class. Udi in Udofia (2020) also affirms that utilization and interaction with varieties of media resources enhances critical thinking, exploration and innovation for building capacities. The use of lecture teaching method relegates students to passivity and focuses on knowledge of the subject matter.

The previous focus of higher education institutions on research matters as an indices of excellence has gradually shifted to learning and teaching. Nadaf, (2017) and Saliu, (2020) have recommended that institutional excellence should take into account all vision and mission of Higher Education in order to demonstrate diversity in excellence: including acquiring knowledge and know-how in subject field, developing a skill for job, and creating more active citizenship multicultural social cohesion and fostering multicultural dialogue. Thus, excellence is now strongly linked to quality teaching and learning. Moreover, Higher Education institutions have a consensus that quality/effective teaching has a role to play in institutional excellence. A lot is known about excellence in University Teaching, Nadaf (2017) has listed; trained professional academic staff, faculty development programmes, participation in skill development courses, publications, monitoring and periodic performance appraised including feedback mechanism as efforts that can improve academic quality and lead to excellence. To meet the demands and expectations of the dynamic societies of the 21<sup>st</sup> century the today's academics should; have an understanding of students and how to help them learn; update regularly their knowledge in teaching and learning issues and exhibit pedagogical competence.

# Centre of Excellence in Teaching and Learning

Centre of Excellence in Teaching and Learning (CETL) are facilities provided by HEIs to provide for the faculty (teaching staff), students and help the institution reach its educational goals (mission). A strategy for tackling the dearth in quality teaching and learning is the continuous building of capacities of lecturers in effective pedagogy through faculty development initiatives provided by Centre of Excellence in Teaching and Learning. They are manned by educational developers. According to Hughes and Mighty (2010), Centre of Excellence in Teaching and Learning (CETLs) play major role in elevating the quality of the faculty, student and the higher educational institution.

According to Public University in Indianapolis, Academic Affairs (2019), the essential paths to teaching and institutional excellence is when lecturers;

- Develop course learning objectives to align them with activities and assessment ensuring they are measureable.
- Implement high-impact practices evidence-based practices, principles of good teaching or other strategies based on how people learn.
- Use good assessment technique such as Classroom Assessment Technique (CATs) and document student progress.
- > Identify teaching mentors with whom they can discuss teaching environ
- Visit the institutions CETL to learn about opportunities, it develops teaching skills
- > Attend at least one teaching related workshop each semester
- Develop through research on teaching and how students learn a written teaching philosophy and what they can do to facilitate students learning.

# Excellence in Teaching and Learning in the Higher Education Institutions in Nigeria

There is empirical evidence that student engagement practices can benefit Nigerian Higher Education students in various ways; such as increased retention, reduction of attrition rate and development of employability skills (Iroegbu & Agbola, 2019; Oluwatobi, Yedun, Ajibola & Oluwunmi, 2020). However, in spite of the efforts by the government, observations and studies by Osganga, Shehu, Oduwaiye and Shehu (2010), and Akanwa and Eluwa (2014) have shown that most Nigeria HEIs do not train faculty on effective pedagogical practices nor do they have faculty development structures. Gone are the days when being a subject area expert is enough qualification for higher education teaching (Obanya, 2011). To achieve quality teaching and learning, academics new or old, with or without initial educational professional qualification need to acquire and update their pedagogical skills regularly. Competent tertiary education teachers should be experts at setting meaningful tasks, monitoring students' performance and offering constructive and individual feedback that will lead to successful mastery (Obanya 2011).

Scholars have identified lack of vibrant, good, consistent staff development programmes as one of the factors attributing to the poor quality of Nigeria CETLs (Asiyai, 2013; Jacob & Musa, 2020; Saliu, 2020). According to the Executive Secretary of the Nigeria Universities Commission, 2017, "there is a general consensus that lecturers require regular updating of their teaching knowledge and skills in order to facilitate achievement of the anticipated learning outcomes and by extension, the desired over- arching objectives of university education" (Daily Times, 2017:1).

According to Saliu (2020) a major challenge in Nigerian universities is the quality of teaching. He emphasizes the need for "new attitudes towards teaching", so as not to perpetuate the old ways of teaching which have led to unproductive university system. He recommended among others, capacity building in teaching, student-centered approach to teaching and learning and the establishment of teaching and learning center (pedagogic center) as critical elements for the achievement of excellence in teaching in Nigerian universities. Africa has also joined the trend and pedagogy training for higher education teachers is gradually becoming "the in-thing in the region" (Obanya, 2011:2) and Nigeria should follow suit.

## Conclusion

The research reviewed here on global best practices have shown that these practices are in line with pre-existing cognitive theories of learning and their application can result in effective pedagogy. Review of two such practices, Lecture chunking and Transparency in Learning and Teaching (TILT) techniques have also revealed their efficacy in bringing about academic success. Thus applying research into implementation of these teaching and learning practices and others, aligns faculties to the path of effective teaching and learning.However literature have not revealed their application in Nigeria HEIs. It is also revealed here the strong advocacy for skilling Nigeria lecturers in effective pedagogy. These all culminates to the need for research and upskilling of Faculties in the art of effective teaching and the establishment of faculty development structures for this purpose. These efforts are necessary in order to align Nigerian Higher Education Institutions on the path of excellence.

#### Suggestions

Based on the above reviews and the conclusion arrived, the paper suggests that:

- 1. Faculties in HEIs in Nigeria be continuously trained and retrained on the application of global best practices in pedagogy.
- 2. Nigeria Higher Education Institutions imbibe the 'excellence' culture by integrating research based implementation of global best practices in teaching and learning into pedagogy in all fields.
- 3. Nigeria HEIs that have not done so should consider establishing Centres of Excellence in Teaching and Learning in their institutions.

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#### UNDERGRADUATES' PERCEPTION OF CHEMISTRY EDUCATION AS A TOOL FOR NATIONAL DEVELOPMENT

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#### Abstract

The scientific and technological revolution witnessed in the world today anchors on science course of which Chemistry education is in the center stage. The study examined undergraduate students' perception of Chemistry education as a tool for national development. A survey research design was adopted for the study. The population of the study comprised of all the 400 level undergraduates' students in 2019/2020 session in the Department of Science Education, Faculty of Education, University of Uyo, Akwa Ibom State. The sample size was 25 respondents consisting of 15 males and 10 females purposively used because of the low enrolment. Two research questions were raised to guide the study and one null hypothesis was tested at 0.05 level of significance. One research instrument titled "Undergraduates' perception of Chemistry Education as a tool for Development Questionnaire (UPCETDQ) was used for data collection. The instrumentwas validatedby three experts from Educational Foundation, Measurement and Evaluation and Science Education Departments, University of Uyo Akwa Ibom State. The reliability of the instrument was calculated using Cronbach Alpha statistic and the reliability coefficient of 0.88 was obtained, which was deemed adequate for use.Mean and Standard Deviation was used to answer the research questions while independent t-test statistic was used to test the null hypothesis at 0.05 level of significance. Findings showed that undergraduate Chemistry students agreed to all the 20 items as a tool for national development. It was also revealed that male undergraduate Chemistry students have a higher perception about Chemistry education as a tool for national development than the female counterpart. Based on the findings, it is therefore recommended among others that Chemistry education should be taught in such a way that students understand its relevance and use the knowledge and skills to improve their economic life and the socioeconomic status of the country.

Keywords: Perception, Chemistry Education, Tool, National Development

#### Introduction

Science education is critical in providing experiences through which students develop necessary scientific knowledge, skills and attitudes to become total person and contribute to the development of the nation. The need to systematically create positive perception about Chemistry as a tool for development is more important now than ever. Chemistry is one of the science subjects that encompasses valuable utility and practical activities. Chemistry education is a comprehensive term that refers to the teaching and learning of Chemistry at colleges, polytechnics and universities levels. It is a course that can significantly develop students' abilities in terms of reasoning , problem solving, creative ability and positive attitude necessary for self-reliant and national development. Tarive (2013) defined Chemistry education as a systematic investigation of nature with a view to understanding and harnessing both human and materials resources to serve human needs. The fundamental principles of Chemistry is to enable students to investigate, explain and predict new phenomena in order tocritically analyse regional, national and international issues.

According to Paul (2005), Chemistry education help to create self-employment opportunities for the youths to take up business ventures in any environment thereby reducing rural and urban drift. It is very clear that meaningful scientific and technological development can only take place when students perceive a course as being relevant and useful for the immediate and future life development. Chemistry education therefore, seeks to provide students at different levels of education with appropriate knowledge, skills, attitude and competencies that would ensure success in place of work as well as managing the emerging societal challenges. The National Policy on Education (FRN, 2013) emphasized that every individual should be self-reliant and contribute to national development amongst other objectives. Hence, Chemistry education plays an important role in the socio-economic development of the country by producing manpower for the various industries including pharmaceuticals and pertrochemicals.

By all standard, a graduate of Chemistry education should acquire hard skills like logical reasoning, conceptual, and manipulative skills as well as go – getting skills like opportunity seizing , entrepreneurial , creative thinking and idea to product skills that can make them self-employed. Small scale production of dyes, chalk, cosmetics, soaps, detergent, perfumes and polymeric materials are peculiar ventures that knowledge of Chemistry can be applied. Unfortunately, this is not so as university graduates in general and Chemistry graduates in particular are becoming societal nuisance and political thugs roaming the street after graduation seeking for white collar jobs. Chemistry education can promote critical thinking and creativity to the point of applying the knowledge in novel situations for self-reliance and national development.

Perception is recognition, identification and interpretation of sensory information in order to represent and understand the presented information or the environment. According to Schacter (2011), perception is the ability to see, hear, understand or become aware of the environment and organized, interpret and consciously participate in scientific activities. The ability to interpret and apply the knowledge, skills and values learnt from Chemistry education in solving day to day problems could lead to sustainable development of individual and the society at large. Students' perception of Chemistry education as a tool for development implies students becoming increasingly aware of the utility and application of knowledge, skills and values of Chemistry education to creating jobs, analyzing situations and solving day to day problems like insecurity, food scarcity, health related problems as well as participating in scientific and technological discussions among others.

Chemistry education can lead to national development. Development is the process of economic and social transformation that is based on complex cultural, environmental and scientific factors. Development is essential and critical to growth and sustenance human existence in any country. Gboyega (2003), defined development as an idea that embodies all attempts to improve the conditions of human existence in all ramifications. It involves improvement in materials and wellbeing of all citizens, in a sustainable way. National development according to Mohammed and Bello (2013), is growing or becoming industrialized towards improving the way of life of individual citizens. This can be achieved through meaningful Chemistry education that would enhance scientific attitudes, cognitive, psychomotor domains for higher order thinking skills. For instance, Chemistry education through appropriate enquiry based teaching and learning equip students with knowledge and skills and competencies as tools for solving societal problems.

The students think formally, logically and in abstraction. Unfortunately, most students are not able to apply knowledge and skills acquired in the classroom to other situations because of inability of realizing the utility value of the knowledge and skills gained from studying such subjects. According to Onwioduokit (2015), any knowledge of science that cannot be applied towards development of the society is not considered meaningful. National development in this study refers to development ofsocial, economic and technological status of the country through application of the knowledge, skills and attitude acquired from Chemistry education. Chemistry education helps in equipping students with the relevant knowledge and competencies to manage emerging challenges in the contemporary society. It also promotes application of scientific principles, particularly those of Chemistry to solve societal issues, help to train Chemistry that stresses scientific reasoning and analytical problem solving with relevant scientific and generic skills required bygraduates to succeed in life (Udofia and Ekong , 2017).

Chemistry education is the systematic process of acquiring knowledge, attitude and skills through which man can use to shape and reshape the world. It is a needed tool scientifically for human, capital and national development. The healthy life many people are enjoying today is due to the variety of pharmaceutical products, agricultural products and food additives that are available as a result of advanced chemical researches in chemistry. Chemistry education according to Udofia (2017) promotes individual empowerment, economic emancipation, cultural preservation and social mobility. Production of different types of fertilizers and insecticides have been possible by chemical industries and these help to increase food production as well as preservation and storage of food for longer period. Many food substances today are enriched by chemical additives which are products from knowledge of Chemistry.

Adesoji and Olatubosun (2008) asserted that Chemistry is a veritable tool for national development and it bridges the gap among other science subjects. Owuamanam and Babatunde (2007) in a study on gender role stereotypes and career choice of secondary school students observed that boys showed interest on brain tasking careers while girls were more interested on courses that do not require much brain work. A study by UdofiaandEkong (2017) on Chemistry education and enhancement of Agricultural production implications for food security noted that the success of Nigeria in this 21<sup>st</sup> century depends on the perception

of the youth towards Chemistry education. This invariably makes Chemistry education a tool that could be used to promote ideas and entrepreneurial skills of its population to make informed choices in an increasingly technological world, boost employment and reduce rural and urban drift. Unfortunately, undergraduate Chemistry students seems not to have positive perception about using Chemistry education to address the technological, economic and social challenges of the nation. The paper therefore investigated the perception of Chemistry undergraduate students towards Chemistry education as a tool for national development.

## The Problem

The slow rate of national development especially in a developing country like Nigeria despite the abundant natural resources is a source of concern to every right thinking citizen of the country. This is clearly demonstrated by the high rate of unemployment and youth restiveness experienced in the country. Studies have shown that many students still consider Chemistry as a difficult, abstract and of no relevant for the future development. This could be rightly linked to students' poor perception towards Chemistry education as a tool for selfreliance, socio-economic and technological development. In actual fact, the study of Chemistry is to provide knowledge, skills and attitude for economic, scientific and technological development. Hence, this study examined the perception of Chemistry undergraduates in the Department of Science Education, University of Uyo towards Chemistry education as a tool for national development in Nigeria.

## **Purpose of the Study**

The purpose of the study is to determine students' perception of chemistry education as a tool for National Development in Nigeria. Specifically the study sought to:

1. determine the undergraduates' perception towards Chemistry education as a tool for national development.

#### **Research Questions**

- 1. What is the perception of Chemistry undergraduates towards Chemistry education as a tool for national development?
- 2. What is the perception of male and female Chemistry undergraduate students towards chemistry education as a tool for national development?

#### Null Hypothesis

1. There is no significant difference in the perception of male and female Chemistry undergraduates towards Chemistry education as a tool for national development?

#### Methodology

Survey research design was adopted for the study. The population of the study comprised all 400 level Chemistry undergraduates' students in the Department of Science Education, Faculty of Education, University of Uyo, Akwa Ibom State. The sample size consisted of 25 respondents consisting of 15 males and 10 females purposively used because of low enrolment. One research instrument titled "Undergraduates' perception of Chemistry Education as a tool Development Questionnaire (UPCETDQ) was used for data collection.

The instrument consisted of two sections A and B. Section A sought information for students' demographic factors while section B consisted of 25 items structured on a 4-point Likert Scale of strongly agree (SA) = 4, agree (A) = 3, disagree (D) = 2 and strongly disagree (SD) = 1. The instrument was validated by three experts from Educational Foundation, Measurement and Evaluation and Science Education Departments, University of Uyo Akwa Ibom State. The reliability of the instrument was calculated usingCronbach Alpha statistic and the reliability coefficient of 0.88 was obtained which was deemed adequate for use. Mean and Standard Deviation was used to answer the research question while independent t-test statistic was used to test the null hypothesis at 0.05 level of significance. The means were interpreted using cut-off points of 2.50 and above as agree, while below 2.50 was disagree.

#### Results

**Research Question 1:** What is the perception of Chemistry undergraduates towards Chemistry education as a tool for national development?

Table	1:	Means	and	Standard	deviations	of	undergraduates	students'	perception
towards Chemistry Education as a tool for national development									

S/N	ITEMS	MEAN	SD	RMKS
1.	Chemistry education provides varying career choices for self-reliance.	4.00	.00	Agree
2.	Chemistry education equips graduates with hard and soft skills for self- reliance.	3.39	.29	Agree
3.	Provides quality job opportunities in both private and public sectors.	3.52	.30	Agree
4.	Chemistry education helps to reduce unemployment	3.56	.50	Agree
5.	Knowledge of chemistry education can help students to establish cottage industries.	4.00	.00	Agree
6.	Chemistry education can helps graduates to become entrepreneurs.	3.69	.26	Agree
7.	Chemistry education helps in adoption of new technologies	3.26	.28	Agree
8.	Chemistry education helps in the production of domestic chemicals like insecticides and perfumes	3.04	.23	Agree
9.	Chemistry education has the potential of transforming the economy of the nation positively.	3.39	.29	Agree
10.	Chemistry education is a foundation of all industries.	3.17	.30	Agree
11.	Chemistry education is a course that promotes creativity.	3.65	.28	Agree
12.	Knowledge of chemistry education qualifies an individual to work in any industry	3.52	.30	Agree
13.	Without the knowledge of chemistry, industries will lack manpower.	3.30	.36	Agree

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14.	Chemistry education helps in enhancing scientific	3.65	.34	Agree
15.	Chemistry education help to build a strong manpower in the country.	3.17	.30	Agree
16.	Graduates of Chemistry education are knowledgeable to take up any work and excel in it.	3.39	.29	Agree
17.	Chemistry education enable graduates to acquire skills to become entrepreneurs	2.91	.22	Agree
18.	Provide solutions to societal challenges like poverty.	3.04	.26	Agree
19.	Chemistry education helps in the utilization of material from the immediate environment for the development of small scale industries.	3.08	.36	Agree
20.	Chemistry education helps to reduce over dependence on government for employment.	3.52	.30	Agree

The result presented in Table 1 shows the mean responses of undergraduate Chemistry students' perception towards Chemistry education as a tool for national development. The result shows that the respondents agreed to all the 20 items with items 1 and 4 having the highest mean values of 4.00 and 4.00 with the standard deviation of (.00 and .00) respectively meaning that the students had the same response for the two items. In general the standard deviation were close indicating that the students did not differ much in their opinion. All the items have the mean values above the cutoff point of 2.50. This indicates that Chemistry education is a veritable tool for national development.

**Research Question 2:** What is the perception of male and female undergraduate Chemistry students towards Chemistry education as a tool for national development?

# Table 2: Mean and Standard deviation of male and female undergraduate Chemistry<br/>students' perception of Chemistry education as a tool for national<br/>development

Variable	Ν	Mean	SD
Male	15	36.40	11.50
Female	10	35.78	12.00

The result presented in Table 2 shows the mean and standard deviation of undergraduate Chemistry students' perception of Chemistry education as a tool for national development. Thefinding indicates that the mean scores of male students is 36.40 while the mean scores of female students is 35.78. It therefore means that male undergraduate Chemistry students have a higher perceptionabout Chemistry education as a tool for national development than the female counterpart.

**Null Hypothesis:** There is no significant difference between male and femaleundergraduate Chemistry students' perception towards Chemistry education as a tool for national development.

# Table 3:Independent t-test summary of undergraduate Chemistry students'<br/>perception towards Chemistry education as a tool for national development

Variable	Ν	Mean	SD	df	t -cal	t-crit	Remarks
Male	15	36.40	11.50				
				23	4.40	2.03	*
Female	10	35.78	12.00				

N=25, \* = Significant at 0.05 alpha level

The result presented in Table 3 shows that the calculated t-value of 4.40 is greater than the critical value of 2.03 at 0.05 alpha level of significance. Therefore, the null hypothesis which stated that there is no significant difference in the perception of male and female undergraduate Chemistry students towards Chemistry education as a tool for national development is rejected. It therefore means that there is significant differences between male and female undergraduate students' perception of Chemistry education as a tool for national development.

# **Discussion of Findings**

The descriptive statistics in Table 1 shows that undergraduate Chemistry students agreed to all the 20 items as a tool for national development. The result such as Chemistry educationprovides varying career choices for self-reliance and helps to reduce unemployment were unanimously agreed upon as a tool for national development. The finding agrees with the statement of Paul (2005) who asserted that Chemistry education helps to create self-employment opportunities as well as enabling youths to take up business in any environment. The finding is in line with Udofia (2017) who maintained that Chemistry education proservation and social mobility.

The finding in Table 2 shows that male undergraduate Chemistry students have a higherperception about Chemistry education as a tool for national development than the female counterpart. This could be attributed to the interest showed by male students over the female counterpart. The finding is in agreement with the finding by Owuamanam and Babatunde (2007) who observed that boys showed interest on subjects like Chemistry that is brain tasking while girls were more interested on courses that do not require much brain work.

Furthermore, the finding in Table 3 shows that the calculated t-test value of 4. 40 is greater than the critical value of 2.06 at 0.05 level of significant. This implies that there exists a significant difference between the male and female undergraduate students perception of Chemistry education as a tool for national development. Male students have the mean score

of 36.70 while the female students have the mean score of 35.72 on the perception of Chemistry education as a tool for national development. This finding agrees with the findings of Adesoji and Olatubosun (2008) who reported that Chemistry is a veritable tool for national development and it bridges the gap among other science subjects. The finding is in line with the view ofUdofiaandEkong (2017) who found out that know Chemistry education enhance agricultural production and concluded that the success of Nigeria in this 21<sup>st</sup> century depends on the perception of the youth towards Chemistry education. The implication of these findings is that Chemistry education is an effective tool for national development, therefore undergraduate Chemistry students irrespective of gender should utilize the knowledge and skills to bring about the desired development.

## Conclusion

Based on the findings of the study, it was concluded that chemistry education is a veritable tool and can contribute immensely to national development. The unique knowledge, skills and attitudes acquired from studying Chemistry would help in providing the necessary manpower for chemical and other related industries such as food, paper, iron and steel, petroleum, metals and electronic equipment among others. This means that undergraduates of Chemistry education students should apply the knowledge and skills to become self- reliant as well as providing solutions to the immediate and remote societal problems like food scarcity, pollution, health, poverty reduction among others.

#### Recommendations

It was therefore recommended that:

- 1. Chemistry education should be taught with emphasis on the application of knowledge and skills for national development.
- 2. Chemistry education should be taught in such a way that its relevance is known and understood as a tool for self-reliance to bring about the desired development the society.

Dr. Theresa M. Udofia & Joseph J. Idungfa

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#### INTERNET SEARCH TOOLS AND TEACHING EFFECTIVENESS OF LECTURERS OF PRIVATE POLYTECHNICS IN AKWA IBOM STATE

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#### Abstract

This study examined the influence of the use of internet search tools on teaching effectiveness of lecturers of private polytechnics in Akwa Ibom State. Two research questions and hypotheses guided the study and descriptive survey research design was adopted for the study. A total of 222 lecturers from 3 purposively selected schools out of the six accredited polytechnics in the state were used for the study. Two questionnaires: Lecturers Use of Internet Search Tools Questionnaire (LUISTQ) and Lecturers Teaching Effectiveness Questionnaire (LTEQ) were used to generate data for the study. Linear regression analysis was used in analysis of data. From the result/findings, it was observed that the use of Google search Engine influenced lecturers teaching effectiveness. The result also indicated that use of Yahoo Search directory influenced lecturers teaching effectiveness. Conclusions from the findings led to the recommendation that lecturers should use the internet to search for current and relevant information in their subject area of interest instead of relying on old course content and lecture notes. Administrators of private tertiary institutions like polytechnics should provide computers with internet connectivity for both staff and students.

Keywords: Internet, Google, Yahoo, Teaching Effectiveness

#### Introduction

Internet has been an indispensable tool of the teaching and learning process for both teachers and students as it provides users with great opportunities to access information and communicate. Teachers use internet for a large variety of purposes including materials development, planning lessons, accessing instructional resources and communicating with colleagues (Akudolu, 2002). In addition, teachers guide students to benefit from internet resources in order to do their assignments and projects. The World Wide Web is an interconnection of millions of websites and web pages belonging to different organizations and providing different types of digital information content and services. It is popularly referred to as 'the web'. Onyegebu (2006) reported that one of the objectives of the Nigerian Nation is to actualize globalization through Information Communication Technology (ICT).

The web has become the first point of call for students, lecturers and researchers for finding information because it is now the single largest information market where the supply of information meets the demand (Ifijeh, 2011). The development and growth of the web was enhanced by revolution and explosion of digital information in the 21<sup>st</sup> century. There is also a growing array of different internet–based tools for finding, indexing, classifying and retrieving information on the internet such as search engines and meta-search engine. Search engines and meta-search engines are internet facilities that assist information seekers to find required information on the ever growing web. Search engines are computer programmes written and produced by experts to facilitate information search from the web.

Electronic information sources are becoming more and more important for the academic community in the 21<sup>st</sup> century. Electronic resources are now used more often than print resources by lecturers of higher institutions owing to the nature of their jobs which are primarily information dependent. Globally education at the higher level thrives on adequate access to information resources for teaching, learning and research.

Internet search tools are utilities available on the internet to help one find information among millions of documents on the web. Search tools are categorized into three types: internet directories, search engines and meta-search engines. Each type of search tool accomplishes a different task and locates information in a different way. An internet directory will classify information by topics and also allows users to choose one of the topics to type a keyword or phrase to search. Examples of internet directories are – Directory of Open Access Journal (www.doaj.org), Yahoo Directory (www.dir.yahoo.com) and Best of the web Directory (www.botw.org), among others.

Meta-search engine will search a dozen different search engines and directories simultaneously and display the best ten responses from each search engine. According to Williams and Sawyer (2007), a search engine is a search tool that allows one to find specific documents through keyword searches and menu choices, in contrast to directories which are list of websites classified by topics. A search engine will search the entire contents of the internet by keyword(s). There are different types of search engines examples are: Google (http://www.google .com/); Alta vista (http:.//www.altavista.com/); Exite (http://www.exite. com/) and Lycos (http://www.lyces.com/), among others.

Many lecturers including that of private polytechnics consider computer based activities as integral to and appropriate for the classroom practice of their students. Internet searches, word processing and multimedia presentations are being adopted increasingly by lecturers. The lecturers ability to obtain data and information that meets with course content is very crucial whatever the subject area or choice of software (Kimber, 2007). Studies have shown that proper utilization of internet search tools such as Google and Yahoo for accessing relevant and current information for lesson delivery, stimulates interest and foster meaningful

learning. Unfortunately, despite all the efforts and intervention to encourage and provide the skills and competencies for utilization of internet search tools by teachers, researchers still discover that most of them still rely on old course outlines and notes

In a study to determine the effect of search engines, Fisher (2017) revealed that, when teachers design student activities that involve the use of Google search, students' level of confidence on the topic was boosted. Furthermore, Dohn (2009) opined that teachers use of web applications like Google increases the teachers required technical skills in using these applications and enhances their motives for using an education content.

Internet information resources are fast gaining entrance into the Nigerian academia, taking their place alongside traditional academic resources like textbooks, library and handouts. In the past, instructors of tertiary institutions gave students a lot of handout, but nowadays many instructors use the web as good means of organizing course content and delivering same to the students.

Many research findings indicate that quite a number of teachers and students are aware of the immense benefits of the internet as a tool for learning, teaching and research, though the problem of lack of ICT skills, lack of access and non-availability of facilities is also often reported. Many research work has been conducted on the area of internet usage on academic performance of students but it is rare to get research reports on the use of internet search tools and its influence on effective teaching especially the teaching by lecturers in private polytechnics. Can the use of internet search tools improve the teaching effectiveness of lecturers? In order to answer this question it becomes necessary therefore to access the influence of lecturers' utilization of internet search tools on effective teaching and instructional delivery. Hence the problem of this study was to determine the influence of the use of internet search tools on the teaching effectiveness of lecturers of private polytechnics in Akwa Ibom State.

The purpose of this study was to determine the influence of utilization of internet search tools by lecturers of private polytechnics on their teaching effectiveness. The study seeks to achieve the following specific objectives:

- 1. To determine the influence of utilization of Google search engine on lecturers' teaching effectiveness.
- 2. To determine the influence of utilization of Yahoo search directory on lecturers' teaching effectiveness

#### **Research Questions**

This study addressed the following research questions

- 1. How does the use of Google search engine influence teaching effectiveness of lecturers of private Polytechnics in Akwa Ibom State?
- 2. How does the use of Yahoo search directory influence teaching effectiveness of lecturers of private Polytechnics of Akwa Ibom State?

# Hypotheses

The following null hypotheses were tested at 0.05 level of significance.

- 1. There is no significant influence of the use of Google search engine on teaching effectiveness of lecturers' of private Polytechnics in Akwa Ibom State.
- 2. There is no significant influence of the use of Yahoo search directory on teaching effectiveness of lecturers' of private Polytechnics in Akwa Ibom State.

#### Literature Review

This study is based on F. D. Davis (1989) Technology Acceptance Theory which is an information system theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it. The predominant factors here being: perceived usefulness (DU) and perceived ease of-use (PEOU).

Perceived Usefulness: This is defined by Fred Davis as the degree to which a person believes that using a particular system would enhance his or her job performance. It means that whether or not someone perceives that technology to be useful for what they want to do.

Perceived Ease-Of-Use (PEOU): Davis defines it as the degree to which a person believes that using a particular system would be free from effort. If the technology is easy to use, then the barriers are conquered, if it is not easy to use and the interface is complicated, no one has a positive attitude towards it.

According to the theory, perceived ease of use and perceived usefulness are the most important determinants of actual system use. These two factors are influenced by external factors majorly social and cultural factors. The actual system use is the end point where everyone is able to use technology to meet individual needs leading to formation of behavioural intentions influenced by attitude and general impression of the technology.



Fig. 1: Technology Acceptance Model (Davis, 1989)

The relevance of this theory to this study is that the use of internet search tools by lecturers will be determined by their perceived usefulness of internet search tools to enhancing teaching and learning. Moreover, the lecturers will be disposed to using internet search tools for academic purposes if it is perceived as user friendly as well as enhancing their job performance as teachers.

The concept of teaching effectiveness is usually in the context of evaluation. Teaching effectiveness is more than just the successful transference of knowledge and skill or application around a particular topic. Student's ratings are frequently described as measures of teaching effectiveness as relating to student centered approaches to learning that analyses, develop, create and demonstrate understanding. It involves teachers' acknowledgement of the changing focus and role of the teacher within the confines of education. According to Skelton (2005), there are three elements to consider when evaluating teaching effectiveness within a particular context: Criteria – attributes of effective teaching, Evidence – documentation of teaching considered in the review process, evidence should include contributions from students and colleagues, and Standards – expectations of quality and quantity for each evaluation criteria. The corresponding standards should fit the context in which teaching is evaluated.

Information bearing resources has changed drastically in the 21<sup>st</sup> century as more and more technological innovations emerge. The introduction of the internet and the World Wide Web has made information more accessible than in the print media era. Information resources available on the internet include e-journals, e-books, wiki resources, reference resources, virtual library resources among others. Nwosu and Anyira (2012) stated that the entrance of the internet into the information age has had many impacts on our way of life. Prominent among these impacts are the changes in information storage and retrieval. Like the library, the internet stores a large amount of information (in the form of web pages) in individual databases.

Williams and Sawyer (2007) stated that the internet is the largest computer network connecting over 200 smaller networks around the world. It was established in 1969 as ARPANet (Advanced Research Project Agency Net Work) by the United States Ministry of Defense. The web is the resource–base of the internet where information is stored and retrieved with accessing facilities such as search engines. The Wikipedia free encyclopaedia defines internet search engine as a software system that is designed to carry out web search (internet search) which means to search the World Wide Web in a systematic way for particular information specified in a textual web search query. The search results are generally presented in a line of results often referred to as search engine result pages (SERPS). The information may be a mix of links to web pages, images, videos, infographics, articles, research papers and other types of files.

Again, Williams and Sawyer, (2007) categorized search engines into three namely:

• Keyword Indexes: A keyword index allows internet user to search for information typically one or two keywords, the search engine then displays a list of web pages containing those key words. Examples Google, yahoo search, Microsoft network (MSN) search among others.

- Meta search engines: A meta search engine allows a user to search several engines simultaneously. Examples are dogpile, metacrawler, profusion, vivisimo among others.
- Specialized search engines: These are search engines that help locate specified subject matter such as movies, health and jobs examples yahoo job search, WebMD, Expedia among others.

Three major functions of a search engine were identified by Aina (2004) to include:

- i. To find a particular document or information resource on the web.
- ii. To bring together the entries of all related web.
- iii. To allow a user to choose from among many entries in the search engine.

Kamba (2007) opined that in the past, instructors of tertiary institutions always give students a lot of handouts. Nowadays, many instructors use internet tools as a means to help them organize course information, and to deliver same to the students. They gather relevant course information through the use of internet search tools such as goggle engines, including posting of assignments, study guides and course content on the internet for the students. According to Lieberman and Nadino (2003), the biggest difference between the use of internet to search for information and the textbook is that: students can find pre-defined text only from the textbook, but from the web, students can view the information that they are really interested in. For teachers and researchers, the internet is a marvellous source where they can find a wide variety of information on every studied discipline.

Concerning the use of internet and effective teaching, "The internet society" (2017) reported that teachers use of online materials to prepare lessons and the use of interactive teaching methods supported by the internet enabled teachers to give more attention to individual students needs and support shared learning. Thus rectifying inequality in education through effective teaching

Though there are various benefits of the use of internet-based resources for teaching and learning, Rebova (2012) stated that teachers' personality and attitudes towards technology play an important role in assessing the benefit brought by internet use during lessons. The report has it that apart from their benefits, teachers should also be aware of certain role and limitations associated with the use of web-site information especially in mathematical instructions. Key issues here being the quality of available information, as freely available materials are merely reviewed and therefore may contain various errors and deficiencies. The tools for accessing internet information are different from those used to access information from other sources such as library materials. Internet search tools comprises basically of search engines and directories. A search engine is defined by Microsoft Encarta Dictionary (2008) as a computer programme that searches for specific words and returns a list of document in which they were found, especially a commercial internet service.

In a study conducted by Akkoyunlu and Kurbanoglu (2002), providing teachers with training within the framework of information literacy involve the use of information resources, evaluation and information search on the internet. The evaluation of the training revealed that teachers level of effectiveness was increased through the use of search engines, such as Google, Boolean search commands, and evaluation of web sites.

In another study carried out by Reiger (2009) to examine the use of web search engines by faculty and students for learning, teaching and research, academic task supported by search engines was used to investigate how students and faculty vary in their use patterns. The study also investigated trust in search engines and job performance. Triangulating three data-gathering methods was used including a web based survey, questionnaires and search log reviews. The survey concluded that though there were variations in search engine use among faculty, graduate and undergraduate students surveyed, there was convergence in means of overall job satisfaction by faculty members and trust in search engines in supporting their research and teaching. The paper concluded with a discussion of the implications of the finding for future search engine research.

Available literature showed that no study on internet search tools and teaching effectiveness of lecturers of private polytechnics has been carried out in Akwa Ibom State. It is against this premise that this study was carried out to ascertain the influence of internet search tools on the teaching effectiveness of lecturers of private polytechnics in Akwa Ibom State, Nigeria.

## Methodology

The descriptive survey research design was adopted for the study. The area of the study was Akwa Ibom State of Nigeria. It is located in the coastal southern part of the country lying between latitudes 4°32'Nand 5°33'N, and longitudes 7°25'E and 8°25'E. The study population comprised of 352 lecturers drawn from 6 accredited polytechnics out of the nine in the state.

Purposive sampling technique was used in selecting three polytechnics for the study. The criteria for selection were ICT facility and internet connectivity in the schools. A total of 222 Lecturers comprising 170 males and 52 females from these three schools was used as sample. In addition, the students in these three schools were used to ascertain the teaching effectiveness of the lecturers.

The instruments for data collection were two structured questionnaires; namely: Lecturers Use of Internet Search Tools Questionnaire (LUISTQ) and Lecturers Teaching Effectiveness Questionnaire (LTEQ). Four-point rating scale was adopted for the questionnaires with response options of Strongly Agree (SA) = 4 points, Agree (A) = 3 points, Disagree (D) = 2 points and Strongly Disagree (SD) = 1 point.

The instruments were face validated. To achieve this, copies of the instrument was given to three experts, one from the Department of Educational Technology and Library Science and two from the Department of Educational Foundations, University of Uyo. All corrections modifications and observations were duly effected before producing the final copies that was administered and used for data collection.

To determine the internal consistency of the instrument, Cronbach Alpha was used. and it yielded the reliability coefficients of 0.80 and 0.83 for Lecturers Use of Internet Search Tools Questionnaire (LUISTQ) and Lecturers Teaching Effectiveness Questionnaire (LTEQ) respectively. The instrument administrered to students were collected the same day while the one for the lecturers were collected the following week. Administration and final collection of the instruments lasted two weeks. Linear regression analysis was used in answering the research questions and testing of the hypotheses at .05 level of significance.

#### Results

**Research Question 1:** How does the use of Google Search engine influence teaching effectiveness of lecturers of private polytechnics in Akwa Ibom state?

# Table 1:Regression model summary on influence of google search on teaching<br/>effectiveness of lecturers in private polytechnics in Akwa Ibom State

Variables	R	R Square	Adjusted R Square	Std. Error of the Estimate	Remark
Google Search and Teaching Effectiveness	.821 <sup>a</sup>	.673	.672	.62677	Very Strong Influence

a. Predictors: (Constant), Google Search

b. Dependent Variable: Teaching Effectiveness

The result in Table 1 indicates the influence of Google Search engine on teaching effectiveness of lecturers in private polytechnics in Akwa Ibom state. The table shows the R-value as 0.82 and coefficient of determination  $R^2$  as 0.67. This means that 67.3% proportion of variation in the dependent variable (teaching effectiveness) can be attributed to the independent variable (Google Search Engine). This implies that there is a very strong influence of Google Search engine on teaching effectiveness of lecturers in private polytechnics in Akwa Ibom State.

**Research Question 2:** How does the use of Yahoo Search directory influence teaching effectiveness of lecturers in private polytechnics in Akwa Ibom state?

# Table 2:Regression model summary of influence of yahoo search directory on<br/>teaching effectiveness of lecturers in private polytechnics in Akwa Ibom<br/>State

Variables	R	R Square	Adjusted R Square	Std. Error of the Estimate	Remark
Yahoo Search Directory and Teaching Effectiveness	.800	.640	.639	.55423	Very Strong Influence

a. Predictors: (Constant), Yahoo Search Directory

b. Dependent Variable: Teaching Effectiveness

The result in Table 2 indicates the influence of Yahoo Search directory on teaching effectiveness of lecturers in private polytechnics in Akwa Ibom State. The table shows the R-value as 0.80 and coefficient of determination  $R^2$  as 0.64. This implies that 64.0% proportion of variation in the dependent variable (Teaching Effectiveness) can be attributed to the

independent variable (Yahoo Search directory), showing strong influence of Yahoo Search directory on teaching effectiveness of lecturers in private polytechnics in Akwa Ibom State.

#### **Testing of Hypotheses**

**Hypothesis 1:** There is no significant influence of the use of Google search engine on teaching effectiveness of lecturers in private polytechnics in Akwa Ibom State.

# Table 3:Linear regression summary of teaching effectiveness scores of lecturers<br/>based on the use of google search engine

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.	Decision
Regression	178.192	1	178.192	453.596	.000	S
Residual	86.425	220	.393			
Total	264.617	221				

a. Dependent Variable: Teaching Effectiveness, S = Significant at p < .05

b. Predictors: (Constant), Google Search

The result in Table 3 reveals the influence of the use of Google search engine on teaching effectiveness of Lecturers in Private Polytechnics, with the F value = 453.596, p-value .000, with degrees of freedom of 221. Since the p-value is less than 0.05 (p < 0.05), the null hypothesis which stated that there is no significant influence of the use of Google search engine on teaching effectiveness of Lecturers in Private Polytechnics in Akwa Ibom State is rejected. It can therefore be concluded that there is a significant influence of the use of Google search engine on teaching effectiveness of Lecturers of Lecturers in Private Polytechnics in Akwa Ibom State is rejected. It can therefore be concluded that there is a significant influence of the use of Google search engine on teaching effectiveness of Lecturers in Private Polytechnics in Akwa Ibom State.

**Hypothesis 2:** There is no significant influence of the use of Yahoo search directory on teaching effectiveness of lecturers of private polytechnics in Akwa Ibom State.

Source of Variance	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Regression	120.368	1	120.368	391.857	.003	S
Residual	67.578	220	.307			
Total	187.946	221				

# Table 4: Linear regression summary of teaching effectiveness scores of lecturers based on the use of yahoo search directory

a. Dependent Variable: Teaching Effectiveness, S = Significant at p < .05

b. Predictors: (Constant), Yahoo Search Directory

The result in Table 4 reveals the influence of the use of Yahoo search directory on teaching effectiveness of Lecturers in Private Polytechnics, with the F value = 391.857, p-value .003, with degrees of freedom of 221. Since the p-value is less than 0.05 (p < 0.05), the null hypothesis which stated that there is no significant influence of the use of Yahoo search directory on teaching effectiveness of Lecturers of Private Polytechnics in Akwa Ibom State

is rejected. It can therefore be concluded that there is a significant influence of the use of Yahoo search directory on teaching effectiveness of Lecturers of Private Polytechnics in Akwa Ibom State.

## **Discussion of Findings**

## Influence of lecturers use of Google Search Engine on Teaching Effectiveness

The findings of the study indicated a very strong influence of lecturers' use of Google Search Engine on teaching effectiveness. It also showed that 67.3% of the variation in lecturers teaching effectiveness can be attributed to the influence of the independent variable (Google Search Engine). The findings of the study is in agreement with that of Akkoyunlu and Kurbanuglu (2002) who conducted a study to access teachers use of information resources, evaluation and information search on the internet. The study revealed that teachers level of effectiveness was increased through the use of Search Engines such as Google, Boolean search commands and evaluation of web sites. However, the findings are at variance with that of Kyung (2010) who reported that students and university lecturers do not make effective use of online journals, e-books and other internet tools.

This finding could be attributed to the lecturers access to current information to update course materials and lesson planning from Google Search Engines. This affirms Teachthought (2016) opinion that the internet still remains as one of the most powerful and rewarding instructional tools available to the teacher.

## Influence of Lecturers use of yahoo Search Directory on Teaching Effectiveness

The findings from the results on the influence of lecturers' use of Yahoo search directory on teaching effectiveness indicated a significant influence. The findings also showed that 64% of the variation in lecturers teaching effectiveness can be attributed to the influence of the independent variable (Yahoo Search directory). The findings of the study are in agreement with the findings of Fullick (2004) who examined the use of internet by teachers and students in the science classroom. The study sited Yahoo directory as an internet tool that is easy to use, intuitive and helpful to Science teachers in their lesson delivery. Again the findings could be attributed to lecturers' use of yahoo search directory to update course materials and exposing students to classroom activities involving use of internet search tools.

#### Conclusion

Based on the finding of this study, it is concluded that the use of Internet search tools influence teaching effectiveness of lecturers of private polytechnics in Akwa Ibom State as the use of Internet Search Tools enables them to access current and relevant information for lesson delivery thus enhancing effective instructional delivery.

#### Recommendations

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

- 1. Lecturers should go online and search for relevant information to enrich their course content instead of relying on old lesson notes.
- 2. Lecturers should take the initiative to acquire internet information retrieval skills since their professional effectiveness is related to their ability to access and use current and relevant information from the internet.
- 3. Lecturers should incorporate activities involving use of internet search tools into the classroom for students.
- 4. Administrators of private polytechnics, particularly polytechnics should provide computers with internet connectivity for both staff and students.

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#### PRINCIPALS' SECURITY MANAGEMENT APPROACHES AND TEACHERS' JOB EFFECTIVENESS IN AKWA IBOM NORTH-EAST SENATORIAL DISTRICT, AKWA IBOM STATE

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#### Abstract

The objective of this study was to examine principals' security management approaches and teachers' job effectiveness in Akwa Ibom North-East Senatorial District, Akwa Ibom State. The ex-post facto research design was used for the study. The population of the study comprised all teachers in public secondary schools in Akwa Ibom North-East Senatorial District, Akwa Ibom State. The population of the study consisted of 3073 teachers in the 89 public secondary schools in 9 Local Government Areas that make up Uyo Senatorial District of Akwa Ibom State. The sample which stood at 350, representing 11% of the entire population of the study, was chosen using purposive sampling technique. The questionnaire tagged "Principals' Security Awareness and Teachers' Effectiveness Questionnaire (PSATEQ)" which consisted of three sections was the major instrument for data collection. The questionnaires were administered and collected. Data generated therefrom was used to answer the research question posed, as well as test the hypothesis formulated for the study, using linear regression analysis. Findings showed that principals security approaches significantly predict teachers' job effectiveness in Akwa Ibom North-East Senatorial District, Akwa Ibom State. It was recommended among other things that government should ensure that the principals participate in security management trainings aimed at securing the environment for teachers to carry-out their responsibilities.

Keywords: Security Management, Principals' Approaches, Teachers' Job Effectiveness

# Introduction

Security is the protection of life and property of an individual, group of individuals or an organisation. It can also be referred to as a state of freedom, peace and tranquillity that guarantees the movement of persons from one location to another. The absence of security in any organisation brings about fear which limits the extent a worker would give his best. Trump (2010) sees security and school safety as the protection that a school management ought to provide for students, staff and other persons within the school against threats through well-drawn policies.

Principals are tasked with the responsibility of providing effective leadership that would guarantee a safe and conducive learning environment,. The school environment is not just for academic purpose, it is place for personal growth and social interactions. However, the paramount concern of a school principal should be safety and well-being of students as well as other members of the school community. A safe and nurturing environment is crucial to the success and attainment of school goals. The sense of feeling unsafe, either due to direct or indirect violence while at school decreases active participation, impacts learning potential, and leads to an increase in emotional problems. It also manifests symptoms of depression in students. These symptoms, in turn, interfere with how well teachers are able to carry out their responsibilities effectively (Onuorah and Nwankwo-Favour, 2020).

However, feeling unsafe at school may hinder his ability to render his service effectively, thereby slowing down the overall progress of the school system. Studies abound that shows that teachers who feel generally unsafe may likely not be punctual at school for the fear of being harmed. Matsitsa (2011) stressed that the school pprincipal must be up and doing in addressing appropriate levels of security concern within the school environment. Becoming a school principal comes with enormous responsibilities; apart from providing effective leadership, school principals are saddled with the responsibility of protecting life and property within the school environment. To achieve this, the principal ought to be equipped with security management approaches needed to keep school environment safe and secured for teaching and learning to thrive.

Achieving a secured school environment requires a lot more than just administrative processes. It requires a comprehensive plan that include physical systems as well as solutions to address other future potential threat, while ideally creating awareness and interventions to the precursors to school violence. Onuorah and Nwankwo-Favour (2020) asserted that security management approaches as envisaged by this study will include: utilization of technological solution to tackling security threats, improvement access management, identification management and behaviour management support.

Ensuring improved security within school environment is really an herculean task, but no task is more rewarding than the protection of lives within the environment. Onuorah and Nwankwo-Favour (2020) in their study found that principals of public secondary schools in Anambra State utilize human security management practices to a low extent. Amanchukwu (2012) described the application of technological innovation in handling security matters as a game changer. This is because of the level of acceptance the world is according technology in addressing social issues. Applying technology in dealing with security challenges in schools is the real deal, considering the effectiveness, efficiency, accuracy and transparency technology brings in tacking security issues. Modern technology for security include CCTV camaras, proximity cards, biometrics, electronic doors, electronic identity management, scanners, communication gargets such as radios etc. These equipment have been proven to be accurate, reliable and efficient in managing access, detecting imposters and security the school premises.

Threats to lives and property in a school emanates from both internal and external angles. While it is imperative to maintain physical restrictions to access into the school environment, it is also necessary for school principals to checkmate the activities of visitors to the school at all times. This visitors include parents, friends of staff, those attending meetings, food vendors etc. There is need to ensure strict access control to the school premises at all times. It's well known that visitors present a threat vector. The right visitor management solution provides myriad of benefits to school safety initiatives and is considered a best practice when increasing security. Beyond providing a means to check in, identify, and track visitors, a management system gives visibility. With printable badges that are worn throughout a visit, it is easy for staff to recognize who belongs on the campus and who does not. Visitor management should be married with other procedures to increase its effectiveness. Establishing a single point of entry and exit can help monitor who comes in and goes out. Identity management does more than provide data on the comings and goings of students and staff. It can also provide information that administrators need to identify signals to potential problems. Schools long ago adopted photo IDs as a layer of internal defense. Being able to quickly identify students and staff by their ID helps minimize the likelihood of someone being where they do not belong.

Behavioral tracking is an area that benefits from consistent reporting but can place increased stress on teachers. It is also an area in which intervention and access to student services will help secure the school and provide a better experience for students. Occasional acting out in the classroom is expected across clases. However, consistent behavioral problems can signal bigger issues. Even when clear procedures are in place for tracking outbursts and other negative behaviors, recording incidents may not always be at the top of a teacher's to-do list. Notes are sometimes made in a grade book, periodically information is provided to the office, or perhaps a note is sent home. Incident reports can be time consuming to fill out and takes attention away from other students. School principals and school managers face an increasingly difficult task. They must however provide high-quality education as well as a safe nurturing environment in the midst of an uncertain world. To help maintain a welcoming environment, schools must implement security solutions that do not increase the anxiety of students, staff, or parents. At the same time, systems must be put in place to ensure the safety of everyone in the school environment (Ike, 2015).

However, tteachers' job effectiveness has been one of great concern to stakeholders in education of recent in Akwa Ibom North-East Senatorial District. This is due to the deteriorating academic performance of secondary school students in external examinations (Ekpoh, 2007). In recent time, there have been public outcry about the dissatisfactory quality of teaching and learning that takes place in the schools. Although this have been partly due to the prevailing insecurity situation in all parts of the country, which has brought fear and uncertainty to teachers and even students. However this situation if not checked, the attainment of secondary education objectives in the area and Akwa Ibom State general may

be at risk. The Akwa Ibom State government on its part has made substantial efforts to improve teachers' effectiveness through such measures as increased and regular salaries, regular promotions and yet to no avail. Mgbekem (2002) is of the view that employee's needs are important tools for improving the skills and performance of employees in an organization. At the moment it appears the most urgent needs of teachers is a guaranteed safe and secured environment. Odden, Archibald, Fermanich and Gallager (2002), observed that provision of secured learning environment give teachers the confidence to deliver on their responsibilities effectively. Therefore, the focus of this study is to investigate principals' security management approaches and teachers' job effectiveness in Akwa Ibom North-East Senatorial District.

# **Purpose of the Study**

The purpose of this study is to examine principals' security management approaches and the teachers' job effectiveness in Akwa Ibom North-East Senatorial District Nigeria. Specifically, the study sought to find out how the principals' security management approaches could be used to predict teachers' job effectiveness in Akwa Ibom North-East Senatorial District, Nigeria

# **Research Question**

To what extent does principals' security management approaches predict teachers' job effectiveness in Akwa Ibom North-East Senatorial District?

# Null Hypothesis

Principals' security management approaches does not significantly predict teachers' job effectiveness in Akwa Ibom North-East Senatorial District

# Methodology

The ex-post facto research design was adopted for the study. The population of the study comprised all teachers in public secondary schools in Akwa Ibom North-East Senatorial District, Akwa Ibom State. The population of the study consisted of 3073 teachers in the 89 public secondary schools in nine Local Government Areas that make up Uyo Senatorial District of Akwa Ibom State. The sample which stood at 350, representing 11% of the entire population, was selected using purposive sampling technique. The questionnaire tagged "Principals' Security Awareness and Teaching Effectiveness Questionnaire (PSATEQ)" was the major instrument for data collection. It consisted of three sections: Section A that dealt with demographic data of respondents, section B that measured principals' security management approaches and section C which measured teachers' job effectiveness. The instrument was face validated by three experts in Psychology and Educational Measurement. The reliability of the instrument was obtained using Cronbach Alpha reliability procedure, which produced an overall reliability coefficient of 0.79. Data collected from the administration of the PSATEQ were analysed using simple linear regression statistics. Findings showed that principals' security approaches significantly predict teachers' job effective in Akwa Ibom North-East Senatorial District, Akwa Ibom State.

#### Results

**Research Question:** To what extent does principals' security management approaches predict teachers' job effectiveness in Akwa Ibom North-East Senatorial District.?

# Table 1:Simple linear regression for the extent to which principals' security<br/>management approaches predict teachers' job effectiveness in Akwa Ibom<br/>North-East Senatorial istrict.

Variables	R	R Square	Adjusted R	S.E of Estimate
Security mgt approaches	.126	.016	.013	8.676
Effective management				

Entries in Table 1 report the extent to which principals' security management approaches predict teachers' job effectiveness. The R coefficient (.126) is the linear correlation (regression) between principals' security management approaches and teachers' job effectiveness. The coefficient of determination (.016) shows that security management approaches contribute to (16%) variation in in teachers' job effectiveness in Akwa Ibom North-East Senatorial District.

**HO**: Principals' security management approaches does not significantly predict teachers' job effectiveness in Akwa Ibom North-East Senatorial District.

# Table 2:Simple linear regression of the prediction of teachers' job effectiveness by<br/>principals' security management approaches

Variables	Source of Variation	Sums of Squares	df	Means Squares	F-value	Sig.
Security	Regression	421.552	1	421.552	5.600	.000
management	Residue	26197.045	348	75.279		
approach	Total	26618.591	349			
Job Effectiveness						
*** < 05 -:: 6:+						

\*p<.05 significant

The result in Table 2 shows that the calculated F-value of 5.600 has a corresponding p-value of 0.000, which is less than 0.05 level of significance with 1 and 349 degrees of freedom. With this result, the null hypothesis which states that Principals' security management approaches does not significantly predict teachers' job effectiveness in Akwa Ibom North-East Senatorial District was rejected, and the alternate hypothesis was accepted. The result means that principals' security management approaches significantly predicts teachers' job effectiveness.

# **Discussion of Findings**

The result in Table 1 shows that the calculated F-value of 5.600 is greater than the p<.05 level of significance with 1 and 349 degree of freedom. With this result, the null hypothesis which states that principals' security management approaches does not significantly predict teachers' job effectiveness in Akwa Ibom North-East Senatorial District was rejected and the alternate hypothesis was accepted. The result means that principals' security management approaches significantly predicts teachers' job effectiveness. This is because when a school is void of security threats, the confidence of the teachers is boosted to delivery on their duties effectively. This result is in line with the study of Onuorah and Nwankwo-Favour (2020) who found a significant relationship between human security management and teachers job performance in secondary schools in Anambra State. This results has further established the fact that teachers are unable to effectively deliver on their responsibilities due to fear or feeling unsafe within the school environment. With this result however, principals must brace up to the task of providing security through the utilization of appropriate security management approaches in guaranteeing safe and secured learning environment.

## Conclusion

Based on the findings, the study concluded that secondary school teachers are ineffective in their job performance due to the security situation around their school. And to address this challenge, principals must strive to utilize appropriate security management approaches in guaranteeing a safe environment for teachers to do their job.

# Recommendations

Based on the findings of the study, the study recommended that:

- 1. Principals should frequently receive security management training to help them cope with security challenges that may arise within the school
- 2. Principals should be ready to adopt suitable security management approach in keeping the school safe and secured.
- 3. Security consciousness should be the watch word of principals, teachers and students for the achievement of school goals in the midst of insecurity

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## DIMENSIONS OF EMOTIONAL INTELLIGENCE AND SECONDARY SCHOOL STUDENTS' ACHIEVEMENT IN MATHEMATICS

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#### Abstract

The study assessed the emotional intelligence level of secondary school students and examined the relationship between dimensions or factors of emotional intelligence and academic achievement of secondary school students in Mathematics. The emotional intelligence factors considered are interpersonal skill, empathy, stress tolerance, optimism, assertiveness, problem solving and flexibility. Nine research questions were asked and eight hypotheses formulated to guide the conduct of the study. Correlational design was adopted. Data were collected using validated achievement test and standardized emotional intelligence test. The reliability of the achievement test was established using Pearson Product Moment Correlation (PPMC) for alternate forms and a coefficient of 0.78 was obtained. The factors of emotional intelligence and their associated reliabilities established using Cronbach alpha were: interpersonal skills (r = .77); empathetic response (r = .73), stress tolerance (r = .69), optimism (r = .75), assertiveness (r = .78), problem solving (r = .74) and flexibility (r = .80). The validity of the scale was rigorously established through factor analysis and a test re- test reliability of .79 was also established for the scale. Data collected from a sample of 170 senior secondary three students purposively selected from five secondary schools in Abia State were analyzed using mean, standard deviation and Pearson Product Moment Correlation. Result indicated average emotional intelligence level of the students; significant high and positive relationship between stress tolerance, problem solving, optimism and assertiveness (individually) with secondary school students' academic achievement in Mathematics and significant positive relationship between combination of all emotional intelligence factors and Mathematics achievement. However, interpersonal skill, empathy and flexibility individually has significant low and inverse relationship with academic achievement of secondary school students in Mathematics. The research recommended that attention should be paid to development of problem solving, optimism, assertiveness and stress tolerance skills of secondary school students. Consequently, the study recommends training of students on the importance of developing a high level of emotional intelligence and incorporating teaching of emotional intelligence in the curriculum of secondary schools and teacher training programs.

**Keywords:** Dimensions, Emotional Intelligence, Students' Achievement, Mathematics

#### Introduction

Mathematics has been described as a science of logical reasoning. As such certain qualities that are nurtured by Mathematics are power of reasoning, creativity, abstract or spatial thinking, critical thinking, problem solving ability and even effective communication skills (Prafitriyani, Magfirah, Amir, Irmawati & Umanailo, 2019). Hence, understanding the factors related to strong Mathematical achievement or abilities is extremely important. Academic achievement is defined as the extent to which a student or institution has achieved either short or long term educational goals. Academic achievement is commonly measured through examination/test or other continuous assessment scores or grades (Wikipedia, 2021). Academic achievement of students has always been measured using the traditional intelligence tests or other forms of standardized examination. Factors that could affect academic achievement in general and Mathematics in particular ranged from cognitive to non-cognitive. The non-cognitive factors ranges from student-related, teacher-related and school related factors. Prominent among the student related non-cognitive factors that may affect Mathematics achievement is emotional intelligence (EI).

Emotional intelligence as a psychological theory, was developed by Peter Salovey and John Mayer. Daniel Goleman (an American Psychologist) helped to popularize the theory. Emotional Intelligence can be measured by different models such as the ability model, trait model and mixed model (Goleman, 2011). Emotional Intelligence has been explained/defined by several scholars in various ways. For instance, Nnaji, Eze and Madu (2020) described emotional intelligence as a spectrum of non-cognitive skills, capabilities and competencies that influence a person's ability to cope with environmental demands and pressures. It is believed that emotional intelligence allows individuals other ways of being and behaving as compared to those emphasized by traditional ideas of intelligence, the authors noted. Emotional intelligence can also be defined as the ability to empathize, persevere, control impulses, communicate clearly, make thoughtful decisions, solve problems, and work with others in a way that earns friends and success (Fatum in Ajai, et al, 2019). Also, emotional intelligence is seen by other scholars as the capability of an individual to motivate, control impulse and delay gratification, to adjust one's mood and remove distress from swapping the ability to think to empathize and to hope (Duygulu, Hicdurmaz & Akar, 2011, Corina, 2011, Mahood Addel-Dayem & Musa 2013). According to Bar-on in Akanwa (2012), emotional intelligence is an array of non- cognitive capabilities, competences and skills that influence one's ability to sense, understand and effectively apply the power and acumen of emotions as a source of energy, information, creativity, trust and connection. Afolabi (2017) defined emotional intelligence as the ability of an individual to adapt and provide feedback effectively and constructively in managing novel situations and understanding the emotions of self and significant others in the face of frustration. Hence, managing emotions refers to the ability to control or redirect disruptive impulses and the propensity to suspend judgment, to think before acting. Furthermore, Mestre and Barchard (2014) stated that individuals who have developed high level of EI are able to recognize and regulate their own and others emotions. According to Goleman (2011), emotional skills are not in born rather they are learnt skills that must be groomed to attain positive outcomes. Goleman is of the opinion that individuals have a general inborn emotional intelligence which prepares them to learn emotional skills.

Several scholars have outlined different dimensions of emotional intelligence. Goleman (2011) outline five main emotional intelligence components such as self-awareness, selfregulation, motivation, empathy and social skills. Thus, EI construct deals with abilities that could enhance students' cognitive, affective and psychomotor domains of learning, if well developed, and promote better academic achievement. Similarly, Mayer and Salovey in Amalu (2018) noted that EI consist of five basic social and emotional competencies such as self-awareness, managing emotions (self-regulation) motivating oneself (self-motivation), empathy and social skills. Azuka (2012) listed the following as factors of EI: facilitating thought, emotional management, emotional perception, emotional awareness, emotional concern of others, emotional control. According to Nnaji et al (2020), dimensions of emotional intelligence include: self- perception, self-expression, interpersonal skills, stress management, and decision making. Also, Ajai, et al (2019) listed four emotional intelligence domains as self- awareness, self- management, social- awareness and relationship management. Furthermore, Afolabi (2017) outlined and operationally defined seven factors or dimensions of emotional intelligence as interpersonal skills (social ability to interact with others easily), assertiveness (ability to exhibit ones mood in a fair way without selfdestruction), empathetic response (the ability to understand others feelings), flexibility (ability to adjust and adapt to a new situation), problem solving (ability to cope and forge ahead under life challenges), stress tolerance/mood regulation (ability to manage emotions in such a way that problems are avoided), and optimism (the ability of an individual to maintain a positive attitude). Afolabi developed an indigenous emotional intelligence scale containing 40 items distributed among the 7 subscales or factors or dimensions. The present study adopted the dimensions of emotional intelligence as given by Afolabi (2017).

Interpersonal skills are the behaviors and tactics a person uses to interact with others effectively. The skills range from communication and listening to attitude and deportment. Some key interpersonal skills include self-confidence, relational management, receptiveness to feedback, listening, collaboration and positive attitude. The classroom is a social system in which the teacher and the students interact as organizational members. The quality of classroom relations is dependent on the activities of both the instructor and the students. Rifdah and Priatna (2019) reported positive correlation between Mathematical resilience and communication and Mathematical skills.Empathy is the ability to emotionally understand what other people feel, see things from their point of view, and imagine yourself in their situation. It entails sharing the feelings of another person. Ghazy, Rather and Rosenberg-Lee (2019) noted that empathy contributes to Mathematics achievement of students.APA dictionary of Psychology defined stress tolerance as the capacity to withstand pressures and strains and the consequent ability to function effectively and with minimal anxiety under conditions of stress. It is the ability to be relaxed and composed when faced with difficulties. Having positive stress tolerance is being able to stay calm without getting carried away by strong emotions of helplessness and hopelessness at stressful situations. According to Kuman, Ram, and Barwal (2016), stress tolerance is related to Mathematics achievement. Optimism can be explained as hopefulness and confidence about the future or the success of something or activity. It means being disposed to take a favorable view of events or conditions and to expect the most favorable outcomes reflecting a favorable view of events.Optimism and pessimism is believed to influence students' achievement in Mathematics (Yates, 2002). In particular, students, with a more generally pessimistic outlook

on life had a lower level of achievement in Mathematics over time, the author noted.Assertiveness means being confident and not frightened to say what one wants or believes. Oladipo, Arigbabu and Kazeem (2012) noted that assertiveness is related to Mathematics achievement. The importance of problem-solving in learning mathematics comes from the belief that Mathematics is primarily about reasoning, not memorization. Problem-solving allows students develop understanding and explain the processes used to arrive at solution.Problem Solving is an integral part of all Mathematics Learning.Problem solving, teaches kids to stop and think before they act. This means that they will be morethoughtful as they work through challenging math problems, and other academic tasks that might confound them. Problem solving skill is required for all, including students, to analyze and find effective solutions to solve problems. Perveenm (2010) stated that problem solving approach has positive effect on academic achievement of students in Mathematics.Flexibility can be seen as the ability to change, to bend, or to persuade. An example of flexibility is being able to work whenever one wants. Someone that is flexible is able to change easily and adapt to different conditions and circumstances. Flexibility in the teaching of Mathematics is understood as the ability to create more than one method of teaching, which allows to understand and master Mathematics taking into account the Specific needs of students and creating a learning environment that encourages thinking and effective work.

Researchers have studied the relationship between emotional intelligence and academic achievement of students in various subjects including Mathematics. Azuka (2012) studied the relationship between emotional intelligence and academic achievement of senior secondary school students in Mathematics in the Federal capital territory, Abuja. The emotional intelligence of the students was measured using emotional intelligence inventory for adolescents developed by Farn-Shing, Ying – Ming, Ching-Yua and Chai – An (2007). Data collected from a sample of 1,160 SS2 students were analysed using Pearson Product Moment Correlation and t-test. Result showed significant low positive relationship between emotional intelligence and academic achievement of students in Mathematics. The study concluded that besides cognitive factors; emotional intelligence of students also affects their academic achievement in Mathematics. Azuka (2012) noted that there is a connection between emotion and cognition. In line with this, Fazuru and Ghazali (2003) stated that having positive quality emotions and feelings help students to achieve and give their best potential in the classroom. As such, teachers should understand that any stress on the affective domain of the learners would affect their cognitive domain in the classroom.

Similarly, Nnaji et al (2020) assessed the relationship between emotional intelligence and students' achievement in Mathematics in Enugu, Nigeria using a correlation design. Youth version of emotional quotient inventory (EQ-12.00) adapted from Bar-on (1997) and achievement test were the instruments used to collect data from a sample of 483 students. Result of data analyses done using multiple linear regressions revealed significant positive correlation between the components of emotional intelligence and students' achievement in Mathematics and that the components individually and jointly contributed significantly to the variations in students' achievement in Mathematics.

Ajai and Iyekekpolor (2019) studied the relationship between emotional intelligence and mathematics achievement of secondary school students in Taraba state of Nigeria. Data were collected from a sample of 312 students using EI inventory adapted from Mayer, Salovey and Caruso (2002) and Mathematics achievement test. Analysis done using regression indicated

that four specified domains of emotional intelligence namely: self- awareness, selfmanagement, social-awareness and relationship management separately as well as totally was found to correlate with achievement in Mathematics of the selected respondents. The study reported an insignificant correlation between emotional intelligence and achievement in Mathematics.

In another study, Prafitriyani, Magfirah, Amir, Irmawati and Umanailo (2019) examined the effect of emotional intelligence on Mathematics achievement of students of class VII middle school in Buru using an ex-post facto design. Data was collected using researcher constructed emotional intelligence questionnaire and achievement test and analysed using multiple regression analyses, Result indicated a positive influence of emotional intelligence on Mathematics achievement. Babajide and Amosu (2019) also investigated the influence of EI on academic achievement of senior secondary school students in Physics using a sample of 315 students from Lagos, Nigeria. Data collected from a self- designed questionnaire and achievement test were analysed using analysis of variance. Result showed significant influence of emotional intelligence on academic achievement in Physics.

A look at literature reveals that existing works on emotional intelligence, either adapted foreign emotional intelligence scale or use researcher-developed unstandardized emotional scale. Some of these instruments fail to accommodate local peculiarities. This creates the need to adopt an indigenous developed and standardized emotional intelligence scale. Hence, the present study sets to assess the emotional intelligence of secondary school students and determine the relationship between EI factors and achievement in Mathematics using an indigenous emotional intelligence scale developed by Afolabi (2017). It is evident in literature that each dimension of this scale in one way or the other relates to Mathematics learning in secondary school. Hence this scale is considered a suitable instrument for measuring the emotional intelligence of secondary school students with a view to finding its relationship with mathematics achievement. Specifically, the study sets to;

- 1. Assess the emotional intelligence of secondary school students using indigenous scale developed by Afolabi (2017)
- 2. Determine the relationship between interpersonal skill and secondary school students' academic achievement in Mathematics
- 3. Determine the relationship between empathy and secondary school students' academic achievement in Mathematics
- 4. Ascertain the extent to which stress tolerance relate to secondary school students' academic achievement in Mathematics
- 5. Determine the relationship between flexibility and secondary school students' academic achievement in Mathematics
- 6. Examine the relationship between problem solving and Mathematics achievement
- 7. Ascertain the extent to which optimism relate to secondary school students' academic achievement in Mathematics
- 8. Examine the relationship between assertiveness and secondary school students' academic Mathematics achievement
- 9. Examine the relationship between combined emotional intelligence factors and secondary school students' academic achievement in Mathematics

#### **Research Questions**

- 1. What is the average emotional intelligence of secondary school students when assessed using Afolabi's (2017) emotional scale?
- 2. What is the relationship between interpersonal skill and secondary school students' academic students' achievement in Mathematics in Abia State?
- 3. To what extent does empathy relate to secondary school students' academic achievement in Mathematics in Abia State?
- 4. What is the relationship between stress tolerance and academic achievement of secondary school students in Mathematics?
- 5. How does flexibility relate to achievement of secondary school students in Mathematics in Abia State?
- 6. To what extent does problem solving relate to secondary school students' academic achievement in Mathematics in Abia State?
- 7. What is the relationship between optimism and secondary school students' academic achievement in Mathematics in Abia State?
- 8. To what extent does assertiveness relate to secondary school students' academic achievement in Mathematics in Abia State?
- 9. What is the relationship between combined emotional intelligence factors and secondary school students' academic achievement in Mathematics in Abia State?

#### Hypotheses

- 1. The relationship between interpersonal skill and secondary school students' academic achievement in Mathematics is not significant.
- 2. Empathy does not significantly relate to secondary school students' academic achievement in Mathematics.
- 3. There is no significant relationship between stress tolerance and secondary school students' academic achievement in Mathematics.
- 4. Flexibility does not significantly relate to secondary school students' academic achievement in Mathematics.
- 5. Problem solving does not significantly relate to secondary school students' academic achievement in Mathematics
- 6. There is no significant relationship between optimism and secondary school students' academic achievement in Mathematics.
- 7. There is no significant relationship between assertiveness and secondary school students' academic achievement in Mathematics.
- 8. There is no significant relationship between combined emotional intelligence factors and secondary school students' academic achievement in Mathematics.
# Methodology

The study adopted a correlational research design. The relationship between students' academic achievement in Mathematics and each factor of emotional intelligence was determined. Furthermore, the relationship between students' academic achievement and the combination of all the emotional intelligence factors was determined. The participants in the study consisted of 170 SS3 students purposively selected from five secondary schools in Abia State of Nigeria. The instruments used for data collection were emotional intelligence scale and Mathematics achievement test. The researcher adopted a standardized indigenous emotional intelligence scale developed by Afolabi (2017). The instrument has a total of 40 items distributed among seven dimensions or factors of emotional intelligence namely: interpersonal skills, empathy, stress tolerance, optimism, assertiveness, problem solving and flexibility. The number of items in each dimension are as follows: interpersonal skill (6), empathy (5), stress tolerance (6), optimism (4), assertiveness (5), problem solving (7) and flexibility (7). The factors/dimensions and their associated reliabilities established using Cronbach alpha include: interpersonal skills (r = .77); empathetic response (r = .73) stress tolerance (r = .69) optimism (r = .75) assertiveness (r = .78) problem solving (r = .74) and flexibility (r = .80). The validity of the scale was rigorously established through factor analysis and a test re- test reliability of .79 was obtained for the scale. The researcher presented the items in a 4 – point Likert system of strongly agree (SA), Agree (A), Disagree (D) and strongly disagree (SD) with weights 4, 3, 2, 1 for positive items and 1, 2, 3, 4 for negative items respectively. Hence, the maximum obtainable score is 160, while the minimum is 40. For the purpose of analyses, the mean response of each student on each of the factors of EI was determined, using assigned weights. Also the average response for all the factors was determined. This was necessary since all the factors do not have equal number of items. For a 4- point Likert scale, the mean response is 2.5. Hence, any student that scored 2.5 and above was considered to be emotionally intelligent.

The other instrument used for data collection was Mathematics achievement tests for SS3. The researcher adapted questions from senior secondary certificate examination questions conducted by West African Examination Council based only on the topics which the students have studied in their scheme of work. Table of specification was used to ensure appropriate distribution or sampling of the items to all levels of cognitive domain. The achievement test was revalidated by two Mathematics educators and one lecturer from measurement and evaluation. Its reliability was 0.78 established using Pearson Product moment correlation formula for alternate forms of the test. The achievement test has 50 items. Each item correctly answered attracts a score of 2 marks giving a maximum obtainable score of 100 whereas any item wrongly answered attracts zero (0) score, giving a minimum obtainable score to be zero (0). The two instruments were administered to students through their mathematics teachers who were properly trained for the purpose. Scores of the students from the achievement test and each of the factors of emotional intelligence as well as the cumulative from all the factors were collated. Data analyses were done using mean, standard deviation and Pearson Product Moment correlation. The results were presented according to research questions and the corresponding hypotheses. The grand mean of all the dimensions of emotional intelligence was compared to the mean of the scale (2.5) to determine the emotional intelligence level of the students. The interpretation of the correlation coefficient was based on the interpretation given by Nwanna in Nworgu (2006) as follows:

Value of r	Interpretation
.80 and above	Very high
.60 to .80	High
.40 to .60	Medium
.20 to .40	Low
.00 to .20	Very Low

The decision rule for hypotheses testing was comparing the significance value with the set probability or alpha level of .05. The individual hypothesis was rejected when the probability or significance level was less than or equal to .05.

## Results

Results of data analyses were presented in tables according to research questions and corresponding hypotheses.

**Research Question 1:** What is the average emotional intelligence of secondary school students when assessed using Afolabi (2017) emotional scale?

Table 1:	Mean	and	standard	deviation	of	emotional	intelligence	factors	for
	second	lary s	chool stude	ents					

Factors	Ν	Mean	Standard deviation
Interpersonal skill	170	2.51	0.285
Empathy	170	2.64	0.157
Stress tolerance	170	2.60	0.661
Flexibility	170	2.63	0.184
Problem solving	170	2.69	0.657
Optimism	170	2.57	0.764
Assertiveness	170	2.68	0.313
Grand Mean	170	2.616	0.318

From Table 1, the grand mean of EI factors is 2.62, with standard deviation .318. This figure is slightly greater than 2.5 which is the mean of the scale. This shows that the emotional intelligence level of secondary school students is slightly above average.

**Research Question 2:** What is the relationship between interpersonal skill and secondary school students' academic achievement in Mathematics?

Ho<sub>1</sub>: The relationship between interpersonal skill and secondary school students' academic achievement in Mathematics is not significant.

# Table 2: Relationship between Interpersonal skill and achievement in Mathematics

Variables	Ν	r	Remarks	Sig	Decision
Interpersonal skill	170	199	Very Low and negative	.009	Reject Ho <sub>1</sub>
Achievement					

From Table 2, the correlation coefficient for interpersonal skill and achievement in Mathematics is -.199. This indicates a very low negative or inverse relationship between interpersonal skill and Mathematics achievement. The significance of the correlation is .009, which is less than the set alpha level of .05. Hence Ho1 is rejected. The implication is that the relationship between interpersonal skill and achievement in Mathematics is significant.

**Research Question 3:** To what extent does empathy relate to secondary school students' academic achievement in Mathematics?

Ho<sub>2</sub>: Empathy does not significantly relate to secondary school students' academic achievement in Mathematics.

## Table 3: Relationship between empathy and achievement in Mathematics

Variables	Ν	r	Remarks	Sig	Decision
Empathy	170	291	Low and negative	.000	Reject Ho <sub>2</sub>

Achievement

The result in Table 3 shows a correlation coefficient of -0.29. This indicates a low negative relationship between empathy and achievement. The significance of the correlation is .000. Since this value is less than the set alpha level of .05, then the null hypothesis is rejected. Hence the relationship between empathy and Mathematics achievement is significant.

**Research Question 4:** What is the relationship between stress tolerance and secondary school students' academic achievement in Mathematics?

Ho<sub>3</sub>: There is no significant relationship between stress tolerance and secondary school students' academic achievement in Mathematics.

# Table 4: Relationship between stress tolerance and achievement in Mathematics

Variables	Ν	r	Remarks	Sig	Decision
Stress Tolerance	170	.997	Very high and positive	.000	Reject Ho

Achievement

From Table 4, the correlation coefficient between stress tolerance and achievement (.997) is very high and positive. The significance of this relationship (.000) is less than the set alpha level of .05. Hence Ho is rejected. The implication is that the relationship between stress tolerance and achievement in Mathematics is significant.

**Research Question 5:** What is the relationship between flexibility and secondary school students' academic achievement in Mathematics?

Ho<sub>4</sub>: There is no significant relationship between flexibility and secondary school students' academic achievement in Mathematics.

## Table 5: Relationship between flexibility and achievement in Mathematics.

Variables	Ν	r	Remarks	Sig	Decision
Flexibility	170	305	Low and	.000	Reject Ho
			negative		

Achievement

Result in Table 5 shows that the relationship between flexibility and achievement in Mathematics (r = -.305) is low and negative. The significance of the relationship (.000) is less than .05, hence the null hypothesis is rejected. The conclusion is that there is a significant negative relationship between flexibility and achievement in Mathematics.

**Research Question 6:** To what extent does problem solving relate to secondary school students' academic achievement in Mathematics?

**Ho<sub>5</sub>:** Problem solving does not significantly relate to secondary school students' academic achievement in Mathematics.

# Table 6: Relationship between problem solving and achievement in Mathematics

Variables	Ν	r	Remarks	Sig	Decision
Problem Solving	170	.998	Very high and positive	.000	Reject Ho

Achievement

From Table 6, Problem solving and achievement in Mathematics has a very high positive relationship (r = .998). This shows that as problem solving increases, achievement in Mathematics increases. The significance level (.000) is less than .05 alpha level. Hence the relationship between problem solving and achievement in Mathematics is significant. The null hypothesis is thereby rejected.

**Research Question 7:** What is the relationship between optimism and secondary school students' academic achievement in Mathematics?

**Ho<sub>6</sub>:** There is no significant relationship between optimism and secondary school students' academic achievement in Mathematics.

# Table 7: Relationship between optimism and achievement in Mathematics

Variables	Ν	r	Remarks	Sig	Decision
Optimism	170	.960	Very high	.000	Reject Ho
			and positive		

Achievement

From Table 7, the correlation coefficient between optimism and achievement in mathematics (.960) is very high and positive. Hence as optimism increases, mathematics achievement also increases. The significance of the relationship (.000) is less than the set alpha level of .05. hence the null hypothesis is rejected. The conclusion is that the relationship between optimism and achievement in Mathematics is significant.

**Research Question 8:** To what extent does assertiveness relate to secondary school students' academic achievement in Mathematics?

Ho<sub>7</sub>: There is no significant relationship between assertiveness and secondary school students' academic achievement in Mathematics.

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Table 8:	Relationship between Assertiveness and achievement in Mathematics						
Variables	Ν	r	Remarks	Sig	Decision		
Assertiveness	170	.798	High and positive	.000	Reject Ho		

Achievement

Result in Table 8 shows a correlation coefficient of .798. This indicates a high positive relationship between assertiveness and achievement in Mathematics. The implication of the result is that as assertiveness increases, achievement in mathematics also increases. The significance of the correlation is .000. Since this value is less than the set alpha level of .05, then the null hypothesis is rejected. Hence, the relationship between assertiveness and achievement in Mathematics is significant.

Research Question 9: What is the relationship between combined emotional intelligence factors and secondary school students' academic achievement in Mathematics?

Ho8: There is no significant relationship between combined emotional intelligence factors and secondary school students' academic achievement in Mathematics.

#### Table 9: Relationship between emotional intelligence and achievement in Mathematics

Variable	Ν	r	Remarks	Sig	Decision
Emotional Intelligence	170	.976	Very high and positive	.000	Reject Ho
Achievement					

Table 9 shows the relationship between the combination of all emotional intelligence factors and achievement in Mathematics. The correlation coefficient (.976) is very high and positive. This means that as the emotional intelligence of the students' increase, their Mathematics achievement also increase. The significance of the relationship (.000) is less than the set alpha level of .05. Hence, the null hypothesis is rejected. The implication is that the relationship between emotional intelligence and achievement in Mathematics is significant.

#### **Discussion of Findings**

This study focused on assessing the emotional intelligence of secondary school students and examining the relationship between dimensions of emotional intelligence and academic achievement in Mathematics. The findings revealed that the emotional intelligence level for secondary school students is about average. Furthermore, the finding shows that there exists significant positive relationship between stress tolerance, optimism, problem solving and

flexibility and academic achievement in Mathematics. However, significant negative relationship between empathy and assertiveness and Mathematics achievement was also reported.

The outcome of the study corroborates the report of other studies. For instance, Nnaji et al (2020) reported significant positive correlation between components of emotional intelligence and students' achievement in Mathematics. Also, the authors found that stress management has the greatest influence on Students' achievement in Mathematics. However, the finding contrast that of Ajai and Iyekekpolor (2019) who reported that emotional intelligence and its four domains have weak correlations with academic achievement and accounts for less than 1% of students' achievement in Mathematics. Similarly, Azimifar (2013) earlier found no significant correlations between emotional intelligence and academic achievement. Furthermore, Prafitriyani et al (2019) stated that there was a positive influence of emotional intelligence on Mathematics achievement. Also Amalu (2018) reported positive relationship between emotional intelligence and academic performance and also that emotional intelligence components (self – awareness managing emotion, motivating oneself, empathy and social skills) had significant combined impact on academic performance. Also Babajide and Amosu (2019) showed that there was significant influence of senior secondary school students' emotional intelligence on academic achievement in Physics.

The result of this study is in line with a priori expectation. The factor of emotional intelligence that has the highest positive correlation with achievement in Mathematics was Problem solving. This factor is closely connected to the cognitive domain. According to Prafitriyani et al (2019), problem solving is one of the qualities that are nurtured by Mathematics. Some of the statement used to measure problem solving as a factor of emotional intelligence include, among others: trying to find solution to life challenges, planning before embarking on anything; trying to solve one's problems as well as those of others, looking for a way out when in a fix; resolving life challenges easily and being prepared for any outcome either positive / negative and not being discouraged by failure. These qualities, when applied in the study of Mathematics will no doubt enhance achievement in the subject.

The next factor of emotional intelligence that correlated highly and positively with Mathematics achievement was stress tolerance. Mathematical concepts are interrelated and interlinked to each other. Hence, effective understanding of a concept depends on proper understanding of its prerequisite. Also, Mathematics is an activity oriented subject and as such, constant practice is needed to master the concept. Hence, efficient understanding and consequent improvement in achievement in Mathematics poses a lot of stress. Some of the qualities that show stress tolerance include: not allowing nervousness to take charge of one, controlling anxiety in the public, being calm in every situation. These factors are considered necessary for achievement in Mathematics. No wonder it is not surprising that stress tolerance positively correlated highly with Mathematics achievement. Another factor that correlates highly and positively with Mathematics achievement was optimism. The nature of Mathematics and the processes needed to arrive at the solution of Mathematics problem require that one is optimistic to persevere to be able to get to the final answer.

On the other hand, the fact that interpersonal skill and empathy have significant negative correlation with achievement in Mathematics is not surprising. The items that show interpersonal skills include: being good at reading people's feelings, finding it difficult relating with other people, tolerating negative social interactions from another person, enjoying company of friends, having social skills to handle interpersonal discomfort, being consciously aware of both positive and negative feelings from other people. Also the items that show empathy include: trying to create positive relationship with people every time, caring about others, identifying oneself with those in need, enthusiastic when communicating one's feelings to others and preferring face to face discussion of disagreement to sending messages. Most of these behaviors are not necessarily relevant for understanding of Mathematics concepts and hence may not correlate with Mathematics achievement. However, the fact that flexibility correlates negatively with Mathematics achievement is contrary to a priori expectation and needs further investigation. Some of the measures of flexibility like being open and ready to learn new ideas, easily adapting to changes are expected to relate positively to achievement in Mathematics.

# Conclusion

Based on the result of the study, the researcher concluded that there is a strong positive relationship between emotional intelligence and students' achievement in Mathematics. Also, the emotional intelligence level of secondary school students in Abia State is just average.

# Recommendations

Based on the conclusion, the study recommends:

- 1. Enlightenment of secondary school students on the importance of developing a high level of emotional intelligence. This will likely improve the emotional intelligence levels of the students.
- 2. That teachers and parents need to pay more attention to the development of problem solving, optimism, assertiveness and stress tolerance skills in their children, in other to enhance their achievement in Mathematics.
- 3. That teaching of emotional intelligence should be incorporated in the curriculum of secondary schools and teacher training programmes.

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