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## Comparative Study of Student Performance in NCE 1 for Three Consecutive Years: A Case Study of Chemistry Department, Federal College of Education, Zaria (2012/13 – 2014/15)

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### Abstract

*This study compared the performance of the Chemistry students of Federal College of Education Zaria (2012/13 – 2014/15) to investigate the relative performance in carry-over courses with those students taking the course afresh. A total of 1,671 students comprising 1,492 students taking the three courses afresh and 179 students carrying the courses in the three years, constituted the sample size for the study. The courses investigated were CHE111, CHE113 and CHE114, respectively. The documented examination result were used in the study. Data were analysed using mean, standard deviation, t-test statistical tool at  $P < 0.05$  which is used in hypothesis testing. The study found out, among others, that the fresh students clearly perform better than carryover students in all the courses analysed in the three consecutive sessions. The t-test shows that there was significant difference ( $P < 0.05$ ) in the performance of carryover students relative to the fresh students taking the course in most cases, as the t-calculated is more than the t-table for CHE 111 and 114 in both 2012/13 and 2014/15 session with CHE 113 having no significant difference. Teachers are expected to vary their teaching strategy to enhance performance in all categories*

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- Fresh Courses
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### Introduction

Chemistry is the foundation of all environmental professions (Bennett *et al.*, 2001). Science students who offer Chemistry must learn and pass it before graduating (Omwirhiren, 2002). Many have been withdrawn from chemistry related program due to inability to pass the basic Chemistry courses (Berg, 2005). In a good learning environment where the best teaching methods for chemistry and instructional materials have been utilized, successful chemistry learning may however not be achieved if the students lack the necessary characteristics that are associated with successful chemistry learning (Omwirhiren, 2003). The performance of chemistry students in

public examinations continues to fall below average. Hence, this study seeks to investigate the student characteristics (learning styles preferences) that are associated with successful chemistry learning in the Department of Chemistry at Federal College of Education, Zaria. The most important student characteristics of concern to this research study are their improvement while doing the course for the second time. Furthermore, there are reported cases of poor performance of students after carrying over certain courses again in the school (Hofstein and Naaman 2011).

This follows that the low achievers who scored below an established standard must be re-drilled until they are qualified

to pass through the system. This process of repeating a course in the academic institutional system until the learner score up to the standard is termed as “carry over”.

Accordingly, the student handbook, FCE Zaria (2002) defines carry over as a situation where a student’s academic performance on a particular course is below the pass mark of 40% or grade (E) in a particular semester but with CGPA of 1.00. Such a student is expected to re-register for the failed course in a semester that the course is available. He is expected also to attend lectures and undergo an assessment in the course.

This mixing of repeating student and fresh student in a class raises an interesting question: does the difference in prior experience lead to a corresponding difference in course outcomes? In other words, are the carryover students generally more successful than the first time students because of their previous experience? Or are they less successful given their unsatisfactory outcomes the first time through?

The answers to these questions would obviously be of interest to repeating students and their academic advisors. It would be helpful to know what students should expect when retaking a course. Will they have an easier time of it than most of their classmates, or will they need to work harder to compensate for their previous weakness?

The performance of carryover student is similarly relevant to

instructors. If repeaters perform differently than first-timers, then professors may want to adjust their teaching methods accordingly (Micheal and Ernest 2014).

Student performance when repeating should also be of interest to public policy makers and university administrators [see, e.g., NCHEA, 2013]. If deficient courses are not repeated successfully students may be forced to change majors or withdraw from university. The extent of students’ repeating success therefore can influence their retention and graduation rates (Micheal and Ernest 2014)

Thus, it is explicit that the introduction of carry over system aims at quality control in the academic system.

It is hoped that this study will highlight to colleges of education instructors the performance of their NCE students taking a course afresh and those rewriting a course for the second or third time, there by contributing to the improvement of instruction at the NCE program especially in Chemistry Department.

It will also aid in reforming the teaching trend and possibly return to the old practice of carefully handling student for better performance.

Also, the study hopes to recommend to the immediate community, local government and even developed nation around to consider the ways of contributing to the improvement of students’ performance in colleges of education to promote science education.

In this research we compare the performance of repeating students to that of first-time students in some chemistry courses. There have been very few studies on the performance of repeating students, and the research results have been inconsistent. Unlike previous work, this study considers both repeating and first-time students, and we distinguish among three different categories of repeating students. Our analysis uses data from official departmental records and thereby avoids potential problems associated with self-reported survey data.

This study will also serve as a guide to chemistry teachers in handling carry-over students.

It is in the light of the above, that the study set to investigate the performance of students in NCE 1 Chemistry for three consecutive years at Federal College of Education, Zaria.

### **Purpose of Study**

The purpose of the study is to investigate the relative performance of students in carry-over courses with those students taking the course afresh.

Specifically, the study compared:

- i. The mean score performance of fresh and carry over students taking the same course.
- ii. The overall performance of students in selected NCE 1 courses in the Chemistry Department, FCE Zaria.

### **Review of Literature**

Many factors have been examined for their potential impact on student performance. Examples include

mathematical skills [Ballard and Johnson, 2004], motivation levels [Arnold and Straten, 2012], peer influence [Contreras *et al.*, 2012], studying time [Bonesronning and Opstad, 2012], and attendance [Patron and Bisping, 2006].

Michael and Ernest 2014 examine the performance of students repeating introductory microeconomics and macroeconomics courses, relative to that of students taking the courses for the first time. The study covers 937 grades received by 439 undergraduate business students. We find that the grades of students who previously failed or withdrew from the course are lower and more variable than those who took it for the first time. By contrast, the grades of students who previously passed the course are higher than the grades of the new students. These differences remain statistically significant after controlling for high school averages.

Another study by Armstrong and Biktimirov [2013] concentrates more directly on the issue of course repeating. It examines students repeating first-year business core courses in calculus, data analysis, financial accounting, macroeconomics, microeconomics, and statistics. The study reports a positive relationship between students' original grades and the new grades they obtain when repeating, but a negative relationship between the original grades and the extent of improvement when repeating. That is, students with high grades in the original attempts tend to obtain the highest grades when repeating; but students with low grades in the original attempts tend to have

the largest increases in grades when repeating.

### Research Hypotheses

The following nulls were tested at 5% level of significance.

- i. There is no significant difference in the grades of the learner before and after carrying over a course.
- ii. There is no significant difference in the performance of carry over students relative to the fresh students taking the course.

### Population and Sampling

This study employed a quasi-experimental research design, based on the documented NCE result in chemistry department, Federal College of Education, Zaria from 2013 to 2015. The population of those offering the courses in the three consecutive sessions were calculated from the summation of the highest number of students in each session since it is the same set of students that write the three courses in each session. Therefore 1,492 students were taking the three courses afresh and 179 students repeating the courses in the three years, with total population of 1,671 students.

The sample used in this study was made up of the entire students in each session of the three consecutive years offering the three (3) courses out of the ten (10) courses offered in Chemistry department, Federal College of Education, Zaria. The courses include CHE 111 (General Chemistry), CHE 113 (Practical Chemistry 1) and CHE 114

(Application of Maths to Chemistry) that fall under folds of 2012/13 to 2014/15 session.

The researcher decided to restrict himself to the students of chemistry only that offered the three selected courses in the department for the said years, because using this small group of students would give a clue to the expected performances of the students in other courses.

The sample is deduced from the population as given in the table 1 below.

### Instrumentation

The instruments used in carrying out this research were primary record; that is the documented NCE result in chemistry department, Federal College of Education, Zaria from 2013 to 2015.

### Validity and reliability of the instrument

The instrument used was valid and reliable in the same vain, for no standardized or even aptitude test of achievement was possible to be given to the attached student in these courses under consideration. In the research, since all of them had since undertaken the courses or even left the school. Therefore, in order to have reliable measure of the academic achievement of the affected students, the examination result obtained by the students in the three courses of the study were considered suitable and dependable data for the research, since all the affected students sat for the examination in the whole years under study.

### Method of data collection

The study involves the collection of fresh and carry over student's result from 2012/13 to 2014/15 session. The procedure for this involves writing an application through the head of department and to the examination officer of the department. This was further facilitated by the fact that the researcher is also a lecturer in chemistry department, Federal College of Education, Zaria.

### Method of analysis

The scores obtained from the result documented in chemistry department, federal college of education, Zaria were analysed using mean, standard deviation to analyse the research question and t-

test statistical tool to test all the null hypothesis each at 0.05 significant level, for CHE 111, 113 and 114 both for fresh and carry over students in the three consecutive years.

### Results

The result obtained from the analysis of data using mean, standard deviation and t-test are presented in tables shown below. The mean and the standard deviation was calculated by substituting the data in their formula while the t-critical was found in the T-distribution table to be 1.645 at 0.005 significant level and  $DF = \infty$  because N values were higher than 120 and the t-calculated was generated from excel using the available data in the tables.

**Table 1: Result of t-test Analysis for 2012/13 Session**

Course	Students	N	X	S.D	Df	t-cal	t-cri	remark
CHE111	Fresh	372	44.5	16.42	387	1.996	1.645	Rejected
	Carryover	17	36.8	19.5				
CHE113	Fresh	372	41.1	12.8	382	0.266	1.645	Accepted
	Carryover	12	34.6	14.4				
CHE114	Fresh	373	44.3	17.2	399	3.550	1.645	Rejected
	Carryover	28	33.9	14.2				

*N = Number of samples; X = score means; S.D = standard deviation; Df = degree of freedom; t-cal = calculated t-value; t-cri = critical t-value*

The result in Table 2 shows that the mean scores of fresh students was higher than that of repeating students in all the three courses and that there is significant difference ( $P < 0.05$ ) between fresh and carryover students for CHE111

and CHE114 as t-calculated is more than the t-table hence the null hypothesis is rejected, while for CHE113 there is no significant difference ( $P < 0.05$ ) between the performance of fresh and carry over students as the t-calculated (0.266) is



less than the t-tabulated (1.645) hence the null hypothesis is accepted.

**Table 2: Result of t-test Analysis for 2013/14 Session**

Course	Students	N	X	S.D	Df	t-cal	t-cri	remark
CHE111	Fresh	546	38	16.61	591	0.072	1.645	Accepted
	Carryover	47	34.5	9.3				
CHE113	Fresh	545	43	15.1	568	1.663	1.645	Rejected
	Carryover	25	39	10.6				
CHE114	Fresh	543	31.5	16.3	596	2.680	1.645	Rejected
	Carryover	55	27	10.0				

The result in Table 3 also shows that the mean scores of fresh students was higher than that of repeating students in all the three courses and that shows that for CHE111 there is no significant difference ( $P < 0.05$ ) between fresh and carry over students as the t-

calculated is less than the t-tabulated hence the null hypothesis is accepted. While there is significant difference ( $P < 0.05$ ) between fresh and carryover students for CHE113 and CHE114 as t-calculated is more than the t-table hence the null hypothesis is rejected.

**Table 3: Result of t-test Analysis for 2014/15 Session**

Course	Students	N	X	S.D	Df	t-cal	t-cri	remark
CHE111	Fresh	573	35	12.8	657	2.100	1.645	Rejected
	Carryover	86	30.5	19.9				
CHE113	Fresh	524	39	15.3	546	0.072	1.645	Accepted
	Carryover	24	39	9.4				
CHE114	Fresh	553	29.5	18.9	647	5.306	1.645	Rejected
	Carryover	96	18.75	14.6				

The result in Table 4 also shows that the mean scores of fresh students was higher than that of repeating students in all the three courses and that that there is significant difference ( $P < 0.05$ ) between fresh and carryover students for CHE111 and CHE114 as t-calculated is more than the t-critical hence the null hypothesis is rejected, while for CHE113 there is no significant difference ( $P < 0.05$ ) between fresh and carry over students as the t-calculated is

less than the t-tabulated hence the null hypothesis is accepted.

### Discussion

The result of comparative analysis of the academic performance of students that are offering chemistry courses in Federal College of Education, Zaria for the second or third time to those that are offering it afresh from 2012/13 to 2014/15 academic session shows that shows that the mean scores of fresh students was

higher than that of repeating students in all the three courses and when comparing the t-critical, 1.645 ( $DF \approx \infty$ ) on the T-distribution table and the t-calculated from excel as in table 1, 2 and 3, there is no significant difference ( $P < 0.05$ ) in the performance of carryover student relative to the fresh students taking the course in most cases. This result is in conformity with Michael and Ernest 2014 which states that The mean grade for repeating students is 6.2 marks lower than that of new students, and a *t*-test shows that this difference is statistically significant ( $p = .006$ ). These results serve as an eye-opener to some extent what may likely be the case with the college. The result as seen with more failure in carryover (repeat) students may be suggestive of an inherent danger as regards the future of the next generation of elders and the fate of educational industries in this country. The anticipated future problems become more evident when one considers the proportion of the Nigerian populace going to colleges' vis-à-vis the financial involvement of sending ones child to schools (Alewu *et al.*, 2013).

This was in conformity with Morrison and No (2007), which showed that there were no statistically significant differences with respect to learning styles and learning strategies between repeaters and non-repeaters. Also in a college case study, Fenton (2002) found that there were no differences between those who repeated and those who did not repeat courses. Therefore, the result follow the same pattern across the three consecutive

sessions where the students taking each of the courses afresh perform better than carryover students. In a meta-analysis of several hundred studies, Jimerson (2001) found a relationship between course repetition and students' academic performance. Students who repeated courses did not perform as well as those who did not. A similar relationship between students' academic performance and course repetition was found in studies in different parts of the world.

The general result of repeating courses suggests that monitoring course repetition by institutional and policy research offices is greatly needed. Further, programs and courses should be analyzed to determine which courses have the highest rate of repetition in order to improve programs and help students to progress to successful completion (Ramzi and Diane 2012).

These higher performance of fresh students over the carryover students could be as a result of a number of factors, some of which are; change in lecturers taking the course over time, Nature of the course, some of the carryover students are feeling ashamed to join their junior ones in taking lectures, incessant negligence on the part of the carryover students, clashes in timetable, the rise in the population growth in the school, less motivation, demoralized and so many others.

However due to the fact that the research was not conducted the year all exams were conducted and scored, and

the fact that the exact factor which is in play at the time the result of the analysis are taken with the two decision standing i.e. the null hypothesis would be both accepted and rejected.

## Conclusions

From this analysis it can be concluded that fresh students perform far better than those repeating some courses for the second or third time as the mean scores shows that the mean scores of fresh students were higher than that of repeating students in both CHE 111, 113 and 114 courses and that t-test shows that there was significant difference ( $P < 0.05$ ) in the performance of carryover students relative to the fresh students taking the course in most cases, as the t-calculated is more than the t-table for CHE 111 and 114 in both 2012/13 and 2014/15 session with CHE 113 having no significant difference while in 2013/14 session the t-calculated is higher than the t-tabulated for CHE 113 and CHE 114 with CHE 111 having no significant difference.

Our data came directly from the college official records, and so has the advantages of being objective and reliable. However, these records naturally do not contain many of the attitudinal, behavioral, and situational factors that would be needed to investigate these within-group differences. For example, while the database tracks the year and semester that each student takes a given course, it does not track the time of day it is offered, the name of the instructor who

teaches it, or the classroom that it occupies. One of the contributions of this study is to show that non-trivial performance differences do exist among repeating students; it consequently opens the door for future research on the causes of those differences.

## Recommendation

The researcher at this juncture strongly wish to forward the following recommendation that if stake holders in Federal College of Education Zaria considered would obviously boost the academic performance of students in the college.

1. Teachers are expected to vary their teaching strategy and based on students' group and experience to enable both the learners easily understand what is being taught to them
2. Teachers are expected to use teaching strategies, guided discovery, cooperative and polya problem solving to enhance performance in all category of student.

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## Prospects and Challenges of Language Acquisition and Language Development: The Way Forward

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### Abstract

*Language acquisition is a crucial stage in children's process of language development. During this period, they struggle with communication, understanding and expressing their feelings. The child's ability to develop fast-thinking, problem-solving skills, and maintain good relationships solely depends on the availability of role models and language repertoire. Consequently, parents need to pay serious attention to their children's language acquisition and development strategies since it is a determinant factor for their success in the language learning process. This can be achieved not only by encouraging them but motivating the children. The parents, older siblings and caregivers must serve as role models to the children. This work aims to identify some learning strategies that can enhance children's language acquisition and language development and the roles of parents and caregivers in motivating them early enough in life to develop receptive and expressive skills as they learn to communicate. Suggestions are made that since parents, older siblings and caregivers are the first teachers' children encounter during this stage, adequate support and motivation should be provided for them by talking to and with them, singing for them and reading*

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### Introduction

Language acquisition is a precursor to language development. It is impossible to talk about language development without acquiring the first language, which in this context of the discussion is regarded as both the Mother Tongue (MT) and the Language of the Immediate Environment (LIE). However, in this context, language acquisition and language development are dealt with as two sides of a coin. It is a process through

which infants or children learn to interact with their parents, siblings and peer groups. The capacity for language development of children starts from the womb. A child in the womb begins to hear linguistic signals through speech utterances outside the mother's womb.

Undiyaundeye (2014) corroborates the above view by saying that "learning begins in the uterus where the foetus starts to recognise its mother's voice and differentiates it from other sounds after

birth". A normal child begins to acquire the language of the parents (MT) naturally without understanding the rules of the language as early as ten (10) months through blabbing.

Within the first five (5) years, infants acquire and develop language spontaneously because everybody is a teacher in their environs (Anyanwu & Otagburuagu 2002). To further enhance this development, parents and older siblings tell them stories, ask them questions eliciting responses and reading aloud letter sounds even picture reading as learning strategies for the vocabulary development. The parents can go ahead and procure other learning materials like audio-visual tapes and CDs with nursery rhymes, storybooks with beautiful pictures all to provide support for their children's language development (Owens, 2017). It is instructive to observe that language is not only a form of communication but a useful medium for imparting cultural values into our children either by spoken or written based on linguistic codes or symbols (Owens, 2017).

Language is an individual as well as social possession (expatiate more on how language is individual and social possession). It enables human beings to express their thoughts, feelings, ideas, and life experiences. Hence, language is regarded as man's invaluable possession as it serves as a distinctive marker between human beings and other animals (Okoro, 2015). Language is cardinal to a strong feeling of kinship among human beings, unlike other animals. Truly,

children are born without prior knowledge or ability to speak their "MT" or the "LIE" which in this case is their first language (L1) yet, unconsciously and without formal teaching and learning at the formative stage (1 year – 5 years), they can acquire several words and grammar of a given language (Okoro, 2015).

Unlike language learning which builds on the premise of the first language (L1) that has been acquired this is usually done in a formal setting where the teacher remains the role model. Language acquisition therefore is the process by which children acquire the capacity to perceive, comprehend, produce and use words through initiation and repetition. Language acquisition ceases at the age of six, giving way to language learning till the end of one's life.

Anyanwu and Otagburuagu (2002) note that speech is specie-specific and has become such an integral part of activities that its complexities of form and mastery are almost taken for granted and the speech proficiency of individuals in a speech community almost neglected or ignored. Thus, from the moment of birth when the first language (L1) signals start to manifest from the child until he begins to utter some simple sentences at the age of about six, the child's attempt to master his L1 follows one long period of unconscious or semi-conscious operation. There is nothing that indicates that the child follows a predetermined pattern of conscious participation in the language program. Rather the child develops language skills through stimulus-response. However, it is

noteworthy to say that language acquisition is maturationally set. As a maturationally determined phenomenon, language acquisition would not be possible if it were not glued to other developmental processes. That is why most “feral man and wolf children” would not speak well after they had been captured by individuals and brought into the human environment. Some scholars argue like Anyanwu and Otagburuagu (2002) argue that the ability of such wild ones to acquire the human language has become permanently impaired because of failure to develop synchronically with other human beings. Language acquisition therefore must be regarded as a developmental need that must be fulfilled at a certain period in the growing process or be lost in life.

### **Methods of Language Acquisition**

Language acquisition is different from language learning. The following are the various ways a child acquires his first language:

- Through unconscious exercise in the child’s immediate environment using parents and older siblings as role models.
- Language acquisition naturally takes place in an informal setting without organized language lessons.
- Children are totally immersed in the language they are trying to acquire, not done under proxy.
- Language acquisition actually is a developmental stage in language use, when the child attempts to process most language tasks and data in phonology, lexis and structure, lexical

items, semantics and vocabulary development simultaneously without formal instruction.

### **Stages of Language Acquisition**

Language acquisition can be divided into receptive and expressive. There are four language skills: Listening, Speaking, Reading and Writing. These can be divided into receptive skills and expressive or productive skills. Whereas listening and reading are regarded as receptive skills, speaking and writing are expressive skills.

### **Receptive Skills**

They are called receptive skills because every individual first of all listens or hears the sounds of a language before responding just as the same way a learner should read before writing. When a child engages in listening or paying attention to what is being said in his environment, he is receiving or gaining information, hence it is called receptive skills, while on the other hand, whenever an individual speaks or writes, he or she is sending out information, and that is called expressive skills (Okoro, 2021).

At home, babies listen to their parents’ and older siblings’ speech and cry whenever there is an unusual sound. From birth to the period of one year (1 year), they can babble two letter words such as *pa*, *ma*, *da*, among others. For instance, they can be attracted by objects that produce sounds, toys, music and rhymes. However, within the first 3 years, the child can respond to simple

commands, enjoy storytelling and answer simple questions.

Allen and Marotz (2017) state that babies use different cries for different situations. For instance, a child may cry because of pain, yet in another context, his cry may indicate hunger or thirst. Furthermore, they added that within 2-3 years, many children ought to have acquired the vocabulary range of about 25-50 words. This enables to ask and answer simple questions. By the age of 3-5 years, children's speech pattern must have improved by becoming longer as they combine at least two or more words to communicate their thoughts, feelings and experiences.

### **Expressive Skills**

In language acquisition and language learning, the two skills referred to as expressive skills are speaking and writing. In expressive language acquisition, speaking especially during the early stage can be seen as the process of putting thoughts, ideas and feelings into verbal form. It implies producing the sounds of language accurately and combining the produced sounds in a specific method into utterances for the sole purpose of communication. At 0-12 months, new babies start making sounds that let others know that they are experiencing pain or pleasure. When they are happy, their smile indicates that they are happy. They have communicated in a non-verbal way even though they did not speak. The baby smiles at you when you come into view. They repeat the same sound a lot and "coo's and goo's". From 1-

3 years, the baby can now accumulate more words as each month passes.

### **Theories of Language Acquisition Noam Chomsky's Perspective**

Chomsky asserts that every child is endowed with the natural ability structured in the brain that controls the production and interpretation of speech. He called it a Language Acquisition Device (LAD). Indices that Chomsky used to support authenticate his claims were: there is an optimal age between language acquisition (1-5 years) and language learning (6 years). Chomsky argues that language acquisition is a function of innate structure in the human brain. He believes that language hinges on performance. However, Dell Hymes propounded a theory of communicative competence to criticize Chomsky's theory of competence vs performance. He says that language is also a cultural and social phenomenon and that a native speaker of a language is also one that can perform in a language. He believes that language comes alive only in inter-group situations. His theory is part of the developmental metrics of language acquisition (the social + the linguistic aspect).

### **Lev Vygotsky's Perspective on Language Acquisition**

The connectivity culture shares with language development of children form the basis of Vygotsky's proposition especially the interpersonal relationship between the child and others. He believes that socialization aids in the learning process. He highlighted the role of "shared language" in the development of



thought. The term “shared language” refers to social interaction and can be well understood in relation to “Zone of Proximal Development” (ZPD). According to Vygotsky, two developmental levels determine the learning process viz-a-viz interaction and egocentricity. What can a child achieve if left to himself and what he can accomplish when playing with others. The ‘ZPD’ is a time children are ready to learn if appropriate support and motivation are given both from the peers, older siblings and adults.

### **B.F Skinner’s Perspective on Language Acquisition**

Skinner affirmed that infants are tabula rasa, which is empty slate. He therefore views language acquisition as a cognitive behavior using operant conditioning. He argues that children develop language through trial and error techniques. In other words, the child tries and tries severally until success is achieved using appropriate support and reinforcement by parents and older siblings such as (attention, smiles and approval nods). When a child requests water to drink and he utters it to the understanding of an adult around him, if he gets it, next time he will be motivated to utter such a word that led to the satisfaction of his needs previously (stimulus-response). This confirms the four contingencies that Skinner believed were the basis for language acquisition i.e. stimulus and response and reinforcing the stimuli, motivating operations and discrimination. He concludes by stating that children acquire language through

imitation and practice as well as prompting and shaping. In all, the three theories point at the environment as a contributive factor to children’s language acquisition.

Vygotsky opines that egocentric speech is a means of socialization among children and their peers. Obviously, a child uses more egocentric speech when playing with his peers than when he is alone. Chomsky is of the opinion that the child’s biological traits will function maximally so long as people are in the child’s environment to activate them. Skinner also opined that children will acquire language naturally by imitation and reinforcement that springs from the immediate environment.

### **Challenges Facing Children during Language Acquisition**

Since it is difficult to speak a language without first, listening to the sound components of that given language, understanding it and assigning meaning, some children learn wrongly by speaking or attempting writing in the language without first listening to and understanding the sounds of the language.

Some Roadblocks are:

- The environment even though it has been upheld to be positive, sometimes may tend to give negative development. For instance, if a child receives a lot of reinforcement in his language use in his environment the tendency of acquiring language faster is there unlike the opponents.

- Socialization index: when a child fails to receive the level or percentage of language support/reinforcement from his social environment, his capacity for the acquisition and development of his first language suffers. For example; if a child has anxiety disorder, if he is neglected, it can affect his speech ability and understanding of objects and concepts in real world situations.
- The physical health and development of an infant can mar his chances in language acquisition. There are some illnesses which can hinder the child from making progress at the stage of language acquisition. Poor health challenges especially at the early years of any child can retard the development lead to speech impairment.

### Conclusion

From the ongoing, Language acquisition therefore is the process by which children acquire the capacity to perceive, comprehend, produce and use words through initiation and repetition. Language acquisition ceases at the age of six, giving way to language learning till the end of one's life. We can deduce that language acquisition stages are critical periods in the life of infants. Therefore, it is incumbent on parents and older siblings to enhance the process of language acquisition in children within their environment.

### Suggestions

To improve the language acquisition and language development of children the following among others should be done:

- Parents and older siblings should create time or make allowance out of their tight schedules to create storytelling time for their children.
- At the early stage of life, parents and caregivers should endeavor as their children's first teachers to motivate and support their language use by reading aloud and singing lullaby songs.
- Provision of learning aids like: toys, CDs for nursery rhymes, alphabets, pictures or picture reading with letter sounds.
- Provision of audio-visual aids to language learning for their vocabulary development.

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## Social Media Addiction and Moral Behaviour Development of Students of Shehu Shagari College of Education, Sokoto

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### Abstract

*The study examined the relationship between social media addiction and moral behaviour among students of Shehu Shagari College of Education, Sokoto. The research hypothesized that there was no significant relationship between these two variables, and that there was no significant difference between social media addicts and non-addicts in terms of moral behaviour among the respondents. The research design used was descriptive survey of correlational type. The target population for this study was 6, 120 students made up of the entire NCE II students of Shehu Shagari College of Education, Sokoto. The students averagely aged between 18 and 29 were heterogeneous in terms of religion, sex, tribe, and economic backgrounds. Stratified, random and proportionate sampling techniques were employed to arrive at 333 respondents using the Research Advisors table (2006). Two instruments were used by the study: Social Media Addiction Scale (SMAS) adapted by Al-Menayes (2015) and Moral Behaviour Scale developed by Rettig & Pasamanick (1959) adapted by Dogara (2017). Pearson correlation was used on the first hypothesis which was bi-dimensional, and chi-square test of independence was run on the second hypothesis. The results showed there was no significant relationship between social media addiction and moral behaviour development. There was, however, no significant difference between addicts and non-addicts among the 333 samples. The research concluded from its results that, there was no significant relationship between social media addiction and moral behaviour development, and there was also no significant difference between social addicts and non-addicts in terms of moral behaviour. The researchers therefore recommended that parents, guardians, teachers, and government should ensure that children and adolescents do not significantly fall prey to the downsides of social media. Each category has a specific role to play with respect to young people's addiction to social networks.*

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### Introduction

The way young men and women nowadays handle themselves online via different social media platforms, resulting in relationships and expression of behaviours which would have rather been difficult or impossible to occur, is a great cause for concern for parents, teachers,

and other categories of people concerned with child-upbringing and moral and cognitive development. The advent of social media marked the first time in human history whereby people got the opportunity to broadcast messages in form of images, words, videos, audios, charts, and a lot more to everyone on the

planet. It is common knowledge that as people become hooked or glued to various activities on social media avenues, there is high tendency of many developing feelings of obsession and irresistibility to sustain such online participation; such is conceptually known as social media addiction.

Addiction to social media is a type of non-substance/behavioural addiction which affects millions of Internet users on the globe today, which necessitates, for many affected people, the adoption of certain psychotherapeutic methods for them to gain a regression from the compulsive behaviour (Powell, 2014).

Social media addiction is a behavioural disorder in which teens or young adults become enthralled by social media and are unable to reduce or cease their consumption of online media despite clear negative consequences and severe drawbacks (Paradigm Treatment Center, 2022). The world continues to witness rapid technological innovations and advancements from which stem electronic devices that are almost fast becoming indispensable instruments in our lives and events in today's world. There is no denying that mere handling of electronic devices, such as cell phones and personal computers, is not psychologically viewed as a problem either to the users of such equipment or their environment. What often raises qualms in relation to such devices is the user's obsession towards the hardware.

Looking critically at social media from psychological viewpoint, it can be

understood that social platforms are embedded with powerful features and activities which can lead to problem behaviour. Social media sites such as Facebook, Twitter, Instagram, LinkedIn, Tiktok, WhatsApp, and Skype have become a global phenomenon; apart from being ways of communication, they are modern avenues for development and sustenance of relationships among peers, family members, couples, working colleagues, and among all kinds of people. The diversity of such online relationships is not viewed as a problem, but the multifaceted psychosocial experiences acquired through such associations. Normally, as relationships take place, social learning, i.e. learning of other people's behaviours, becomes more common and easier. Social media sites, however, serve as springboard for both positive and negative emotions such as joy, love, pride, envy, anger, and aggression which might trigger different sorts of attitudes or behaviours that are constantly weighed on the morality scale in society. This was what tempted the researchers to embark on research that studies moral behaviour as a correlate of addiction to social media platforms among NCE students in Shehu Shagari College of Education, Sokoto.

Addiction is described as a compulsive behaviour that leads to negative effects (American Psychological Association [APA] 2017). Addiction is characterized by the inability to control behaviour; it creates a dysfunctional emotional response, and it affects the users ability to abstain from the

substance or behavior consistently (Psychology Today, 2011). Addictions to, for example, drugs, gambling, sports-viewing, over-eating, etc., make people feel bound to such activities such that they become harmful habits, which then obstruct other important activities in their lives; and this can equally be said of people who use social media excessively. Many people wonder why or how social media become addictive. It is noteworthy that as long as such activities as sports-viewing, gambling, swimming, and so forth are addictive to individuals who participate in them on a regular basis, there is nothing apparently different in the case of social media.

Behavioral addictions have much the same effect on the brain as drugs and alcohol, and the same is no different for social media; and for those who utilize social networking apps on a regular basis, the process of scrolling and viewing images, making posts and receiving positive affirmations from others, and other stimuli create the chemical dopamine in the brain; and dopamine reacts with neurotransmitters and creates feelings of pleasure and reward and causing the formation of “addiction pathways” in the brain that makes it hard to resist urges or stop the behavior (Shafir, 2022).

A social media addict can be considered as one with an urge to use social media excessively and compulsively (Pavlicek, 2013). Such a person would be frequently online posting his/her views on both personal and public issues, checking others' profiles, checking the number of likes attracted by his/her recent posts,

sending friendship invitations, starting up chats with others, and a lot more for many hours at the expense of his/her everyday responsibilities affecting their family, school work, job, or other obligations. Similarly, Ward (2022) highlights seven signs of social media addiction:

- i. First thing one does in the morning or when one wakes up during the night is checking social media.
- ii. Checking social media while working.
- iii. Being anxious when one cannot check the contents of one's social media accounts.
- iv. Being constantly checking how one's posts perform.
- v. Spending a lot of time overthinking and planning of one's posts.
- vi. Hearing one's phone buzz while it didn't.
- vii. Neglecting one's hobbies in favour of scrolling to view more on social networks.

Moreover, a pair of researches conducted by Griffiths (as cited in Social Media Victims Law Centre, 2022), found some six behavioural components characterizing addictive behaviour:

- i. Salience.
- ii. Mood modification.
- iii. Tolerance.
- iv. Withdrawal symptoms.
- v. Conflict.
- vi. Relapse.

As usual, there are risk factors for all psychological problems or disorders. Hence, addiction to social media cannot

be an exception. According to Glowiak (2022), common risk factors for social media addiction include the following psychological conditions and behaviours. However, unless a research-based cause-and-effect relationship has been established on a problem, the situations or issues marked as possible triggers of an identified problem are considered as risk factors, presence of which may or may not cause the problem.

- i. Loneliness.
- ii. Boredom.
- iii. Low self-esteem (e.g. poor body image).
- iv. Inflated self-esteem.
- v. Seeking social support during a difficult time.
- vi. Attention-seeking thoughts and behaviours (Extraversion)
- vii. Jealousy of others' perceived successes.
- viii. The need to compete.
- ix. Seeking pleasure in looking down on others to feel better about oneself.
- x. Lack of close friends and peer groups (Elements of introversion).
- xi. Poor impulse control.
- xii. Depression and social anxiety.

Furthermore, desire or intent to deceive other people through exaggeration or faking of stories and lifestyles can also be a reason for constantly logging in on social networks and ending up addicted.

However, some possible negative consequences from over-using social media, as outlined by Shafir (2022) and Cherney (2020) include:

- i. Low self-esteem and comparing yourself to others.
- ii. Increased isolation and loneliness.
- iii. FOMO (Fear of missing out and feeling excluded).
- iv. Social anxiety and embarrassment.
- v. Exposure to negative people who may teach bad behaviours and bad experiences.
- vi. Disrupted sleep patterns due to the effects of blue light.
- vii. Decreased physical activity, which may affect the individual's overall health.
- viii. Possible poor academic performance due to relaxed study habit.
- ix. Depressive symptoms.
- x. Ignoring real-life relationships.
- xi. Reduced ability to empathize with others.
- xii. Exposure to fake news and misinformation which may cause unnecessary distress, fears, doubts, etc.
- xiii. Possible development of extreme views due to radical, biased, customized contents.
- xiv. Possible development of an overall internet addiction.
- xv. Feeling of withdrawal symptoms when disconnected from social media sites.

Addiction to social media may be tamed when a number of measures or steps are taken. Glowiak (2022) and Quilalang (2022) have outlined the certain techniques that may be adopted to check social media addiction.

- i. Limiting time on social media. The addict should be strict about the length of time to spend on social apps in a day. Very little amount of time should go for social networking.
- ii. Sticking to one app. The affected individual should uninstall or close all but one social media app on their smartphone or personal computer. Allowing many social networks to function on their system is a risk factor for addiction.  
Developing a strong support network. Having a support network including loved ones, family, friends, a therapist, and a support group is ideal.
- iii. Forming healthy off-line habits. Participation in offline hobbies such as sporting activities, reading stories and public discussions that promote health and personal developments are quite helpful. Such will reduce dependency on social apps.
- iv. Managing notifications. Setting filters on social apps so that the addict receives only the most important messages. This may prevent them from scrolling every now and then to view news or messages as they trickle in.

- v. Doing a digital detox. Taking a break from electronic gadgets that are less necessary can help in controlling addiction to social networks.
- vi. Uninstalling of apps. This is almost similar to quitting drugs and other things found to be addictive.
- vii. Using Cognitive-Behavioural Therapy. CBT is a counselling procedure in which individuals suffering various forms of addictions and some other psychological issues involve in one-one discussions with psychologists or counselors about their problems, and share ideas and ways on how such problems can be controlled or treated.

However, unlike in cases of addictions to harmful substances such as alcohol and heroine, and in cases of some other addictions such as gambling, stunt riding, unhealthy risky sexual behaviour, the goal of social media addiction treatment is controlled use, not total abstinence owing to the fact that it's impossible to stop a person from completely using their electronic gadgets or accessing the internet (Quilalang, 2022).

### **Theoretical Framework**

The researchers deem it appropriate to explain how and why addiction to social media occurs with the aid of the following theories.

*Choice theory of addiction* was developed by American Psychiatrist William Glasser and appeared in his 1998 book, 'Choice Theory: A New Psychology of Personal Freedom'. One of



the tenets of this theory is the idea that all behaviour is chosen. Therefore, the motivation for such behaviour is always going to be intrinsic. This theory believes that addiction to certain behaviours, drugs or substances occurs because of the choices people make and not because of some types of diseases in them. It is up to the individual to take responsibility for their actions so that they can rectify the situation. It is suggested that if the addict can find a path that will provide them with happiness they will easily be able to break away from their addiction.

Based on choice theory, the only reason why an individual returns to addiction after a cessation is that they have taken the decision to do so because they are believed to be fully responsible for the relapse, and it will be up to them to quit addiction once again if they choose to do so.

There was also the *self-medication theory of addiction* first published in 1985 in an article in the American Journal of Psychiatry by Mark S. Gold. The theory is based on the idea that people use substances, such as alcohol and drugs, or the effects of addictive behaviours such as eating, watching movies, sex, gambling, etc., to compensate for their underlying problems that have not been properly treated. The self-medication theory usually refers to substance use disorders, but it can also be applied to non-substance or behavioural addictions. This theory of addiction suggests that it is the attempt to self-

soothe with drugs and certain behaviours that eventually leads to addiction.

*Social learning theory of addiction* also came up. It is an adoption of Albert Bandura's model of social learning, which teaches that all behaviour is primarily learned from others within one's environment. In line with the assumptions of Bandura's theory, therefore, our observations of other people engaging in addictive behaviours lead to the development of addiction. When we observe the behaviours and reactions of other people using addictive substances (or activities), we may wish to repeat what we see.

By social learning theory of addiction, it can be deduced that, as an individual comes across a lot of people engaging in activities on social networking sites day and night, such an individual feels tempted to engage in the same behaviour. It can be understood that a lot of social media addicts today were modelled by others into what later became addictive to them.

The researchers also found certain theories of moral behaviour relevant for this research.

*Kohlberg's theory of moral development* was inspired by Piaget's work. According to Kohlberg, there are 3 separate levels: Pre-conventional, conventional, and post-conventional.

- Preconventional/Premoral: Moral values reside in external, quasi-physical events, or in bad acts. The

child is responsive to rules and evaluative labels, but views them in terms of pleasant or unpleasant consequences of actions, or in terms of the physical power of those who impose the rules.

- Conventional/Role Conformity: Moral values reside in performing the right role, in maintaining the conventional order and expectancies of others as a value in its own right.
- Post-conventional/Self-Accepted Moral Principles: Morality is defined in terms of conformity to shared standards, rights, or duties apart from supporting authority. The standards conformed to are internal, and action-decisions are based on an inner process of thought and judgement concerning right and wrong.
- *Piaget's Theory of Moral /Cognitive Development* outlined four developmental stages passed through by humans in their lives. Piaget believed that formation of behaviours take place in people during those consistent phases. The stages are as follows:
  1. Sensorimotor Stage: From birth to age two, children experience the world through movement and their senses. During the sensorimotor stage children are extremely egocentric, meaning they cannot perceive the world from others' viewpoints.
  2. Pre-operational Stage: During the Pre-operational Stage of moral and cognitive development, Piaget noted that children do not yet understand

concrete logic and cannot mentally manipulate information. Children's increase in playing and pretending takes place in this stage. However, the child still has trouble seeing things from different points of view. The children's play is mainly categorized by symbolic play and manipulating symbols.

3. Concrete Operational Stage: From ages seven to eleven, children can now conserve and think logically (they understand reversibility) but are limited to what they can physically manipulate. They are less egocentric. During this stage, children become more aware of logic and conservation, topics previously foreign to them. Children also improve drastically with their classification skills.
4. Formal Operational Stage: From age eleven to sixteen and onwards, children develop abstract thoughts and can easily conserve and think logically in their mind. Children are now able to think abstractly and utilize metacognition. Children in the formal operational stage display more skills oriented towards problem solving, often in multiple steps.

### **Statement of the Problem**

The magnitude of the use of various social media platforms has become a cause for concern in recent times, as this phenomenon has driven many researchers across the globe to undertake studies in the area from the psychological point of view. Like any

other place in the world, users of social media in Sokoto State are equally affected by social media addiction phenomenon.

In line with the researchers' observations, most students of Shehu Shagari College of Education, Sokoto use web-enabled devices with the support of which they connect with their course mates, friends, lecturers, and other people via platforms like Whatsapp, Facebook, Skype, Wechat, and Tiktok On campus and everywhere. These students carry their devices with them chatting, sending messages, and doing much more. Such students apparently portray some sort of addictive behaviour towards these social networking sites. They probably cannot do without such sites any longer. This is made evident by the unending complaints and stern warnings given by lecturers and parents over the excessive online social activities of students.

Many people believe that students spend more time on mere social activities on their devices than on their academic activities. Moreover, these students normally do not meet only good people online. On social media, just like in offline face-to-face interactions, all types of people are available: substance abusers, drug peddlers, thieves, prostitutes, lesbians, gays, monks, nuns, clerics, politicians, etc. Such numerous friends, followers, subscribers, participators and followed platforms may inevitably affect the behaviours of those connected for better or for worse.

The main thrust of this study, therefore, is to examine how social media addiction correlates with moral behaviour development of students of Shehu Shagari College of Education, Sokoto, and to find whether there is any significant difference in terms of moral behaviour between social media addicts and non-addicts.

### **Research Questions**

1. Is there significant relationship between social media addiction and moral behaviour of students of Shehu Shagari College of Education, Sokoto?
2. Is there significant difference between social media addicts and non-addicts in terms of moral behaviour development among students of Shehu Shagari College of Education, Sokoto?

### **Research Objectives**

1. To study the relationship between social media addiction and moral behaviour of students of Shehu Shagari College of Education, Sokoto.
2. To examine the difference between social media addicts and non-addicts in terms of moral behaviour development among students of Shehu Shagari College of Education, Sokoto.

### **Research Hypotheses**

1. There is no significant relationship between social media addiction and moral behaviour of students of Shehu Shagari College of Education, Sokoto.
2. There is no significant difference between social media addicts and

non-addicts in terms of moral behaviour development among students of Shehu Shagari College of Education, Sokoto.

## Methodology

The research design adopted for the study is descriptive survey of correlational type, which primarily focuses on describing the extent of relationships or differences between quantitative variables. A descriptive research design helps provide answers to the questions of who, what, when, where, and how associated with a particular research problem (Baron, 2001).

However, the target population for this study was 6, 120 students made up of the entire NCE II students of Shehu Shagari College of Education, Sokoto. The students averagely aged between 18 and 29 were heterogeneous in terms of religion, sex, tribe, and economic backgrounds. Stratified, random and proportionate sampling techniques were employed to arrive at 333 respondents using the Research Advisors table (2006). The respondents were found to be stratified into six different schools (faculties) further classified into males and females. Because of this stratification, random sampling was adopted such that one course/combination was randomly picked from each school, and the sample came to 2,233. Proportionate sampling method was applied then to produce an appropriate number of respondents in each selected Course/Combination. Percentages were worked out in arriving at the numbers of male and female

respondents. In administering the instruments, random selection was applied.

Two instruments were used by the study: Social Media Addiction Scale (SMAS) Adapted by Al-Menayes (2015) and Moral Behaviour Scale developed by Rattig & Pasamanick (as adapted cited by Danjuma, 2017).

Al-Menaye exposed his adapted scale to a set of senior academicians working in Kuwait University, and obtained a high content validity for the instrument; the resource persons confirmed its relevance to the measured attribute. Additionally, the three-factor scores of the SMAS were correlated with the five items of the Social Media Engagement Questionnaire (SMEQ), and there was a 93% positive correlation, which gives the instrument a high concurrent validity. Moreover, Damilola (2016) further exposed SMAS to lecturers in the University of Ibadan, Nigeria who also adjudged that the instrument had enough content validity to measure social networking addiction on Nigerian population.

The SMAS received a Cronbach's alpha of 0.94 based on a sample of 120 Undergraduate students randomly picked from various Departments in Kuwait University. Damilola (2016) rather conducted a test-retest on 30 students in University of Ibadan and arrived at an 'r' of 0.76, which was high enough for consideration.

The Moral Behaviour Scale developed by Rattig & Pasamanick

(1959) has been adopted in many countries. Coetzee et al. (2005) used the scale in South Africa on secondary school students and reported that the instrument had construct validity. Danjuma (2017) modified the scale and forwarded it to his team of supervisors for vetting. The scale was finally adjudged to have high content validity. The original scale by Rettig & Pasamanick had a Kuderson-Richardson reliability coefficient of 0.93. While, Danjuma (2017) obtained an index of 0.70 in a test-retest on 24 senior students of Government Day Secondary School, Keana, Bauchi State, Nigeria.

### Data Analyses and Presentations

Out of the total sample of 333, the study had a total of 235 addicted respondents; 183 males, 52 females. 98 respondents were not addicted to social media; 74 of whom males, 24 females. Additionally, out of the total sample of

333, 112 male respondents were identified as morally good, 85 wmorally bad, while 71 female respondents were identified as morally good, and 65 morally bad.

**Hypothesis 1:** There is no significant relationship between social media addiction and moral behaviour of students of Shehu Shagari College of Education, Sokoto.

This hypothesis was split into two due to the bi-dimensional nature of moral behaviour, which is either good or bad as measured by the adopted instrument of Crissman, and Rettig & Passamanick (as cited and adapted by Danjuma (2017)). This hypothesis was tested by correlating scores of moral behaviour scale with scores of social media addiction scale of addicted respondents on Pearson Product Moment Correlation Coefficient on SPSS as indicated by Tables 1 and 2.

**Table 1: Relationship between Good Moral Behaviour and Social Media Addiction of Students of SSCOE Sokoto**

Variable	N	Mean	S.D	Df	r-Cal	p-Value	Decision
Good-Moral	183	190.8	34.09	181	-0.05	0.60	H <sub>0</sub> Retained
Addiction	183	53.35	7.63				

Table 1 depicts the analysis of the relationship between good moral behaviour and social media addiction of students of Shehu Shagari College of Education (SSCOE), Sokoto. On the table, it is indicated that out of 235 addicted respondents, 183 possessed good moral

behaviour. Good moral behaviour as the dependent variable shows a mean score of 190.80 with a standard deviation of 34.09. Social media addiction as the independent variable in the analysis indicates a mean score of 53.35 with a standard deviation of 7.63. The table

shows a negative Pearson correlation ( $r$ -Cal) of  $-0.05$  in relation to a  $p$ -Value of  $0.60$  at an alpha of  $0.05$  under  $181$  degree of freedom. As the  $p$ -Value ( $0.6$ ) is greater than  $\alpha$  ( $0.05$ ), the hypothesis is hereby retained, which statistically means that

there is no significant relationship between good moral behaviour and social media addiction of students of Shehu Shagari College of Education (SSCOE), Sokoto.

**Table 2: Relationship between Bad Moral Behaviour and Social Media Addiction of Students of SSCOE Sokoto**

Variable	N	Mean	S.D	Df	r-Cal	p-Value	Decision
Bad-Moral	150	85.03	28.55	148	0.05	0.65	H <sub>0</sub> Retained
Addiction	150	53.35	7.63				

Table 2 depicts the analysis of the relationship between bad moral behaviour and social media addiction of students of Shehu Shagari College of Education (SSCOE), Sokoto. On the table, it is indicated that out of  $235$  addicted respondents,  $150$  possessed bad moral behaviour. Bad moral behaviour as the dependent variable on the analysis shows a mean score of  $85.03$  with a standard deviation of  $28.55$ . Social media addiction as the independent variable indicates a mean score of  $53.35$  with a standard deviation of  $7.63$ . The table shows a positive Pearson correlation ( $r$ -Cal) of  $0.05$  in relation to a  $p$ -Value of  $0.65$  at a level of significance of  $0.05$  under  $148$  degree of freedom. As the  $p$ -Value ( $0.6$ ) is greater than  $\alpha$  ( $0.05$ ), the hypothesis is hereby retained, which statistically means that there is no significant relationship

between bad moral behaviour and social media addiction of students of Shehu Shagari College of Education (SSCOE), Sokoto.

For a better understanding, such a result means that the respondents' addiction to social media platforms such as Facebook, Twitter, Whatsapp, Skype, Instagram, and so on is not significantly related to their bad moral behaviour development. Based on this finding, being frequently on social networking sites does not significantly lead to bad moral behaviours.

**Hypothesis 2:** There is no significant difference between social media addicts and non-addicts on the basis of moral behaviour among students of Shehu Shagari College of Education (SSCOE), Sokoto.

**Table 3: Difference Between Social Media Addicts and Non-Addicts on the Basis of Moral Behaviour in SSCOE Sokoto**

Variable	N	$\chi^2$	Df	p-Value	Decision
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Addict/Non-Addict	333	2.003	1	0.157	H <sub>0</sub> Retained
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Table 3 indicates the Chi-square analysis of the difference between social media addicts and non-addicts on the basis of moral behaviour. Chi square was used because moral behaviour was bi-dimensional (good & bad) and there were addicted and non-addicted respondents, giving a 2×2 contingency table. Among the total of 333 sampled respondents, 235 were addicted, 98 were non-addicted. A Chi-square value of 2.003 and a *p*-Value of 0.157 at 0.05 level of significance under 1 degree of freedom were found. Such a result indicates that the *p*-Value (0.157) >  $\alpha$  (0.05).

The null hypothesis is therefore retained to affirm that there is no significant difference between social media addicts and non-addicts on the basis of moral behaviour among students of Shehu Shagari College of Education (SSCOE), Sokoto. In layman's language, this result means that both social media addicts and non-addicts did not differ much in their moral behaviours. The researcher's arrival at this result and eventual acceptance of this hypothesis were statistically necessitated by the result of the hypothesis which tested the relationship between social media addiction and moral behaviour in which the two sub-hypotheses were both equally retained.

## Discussions

For a better understanding of the finding from the analysis of hypothesis one, the statistics means that the addictive behaviour of the respondents, who were students of Shehu Shagari College of Education, Sokoto, with respect to social media platforms such as Facebook, Twitter, Whatsapp, Skype, Instagram, and so on did not significantly correlate with their good moral behaviour development. Based on the finding, it could be deduced that being frequently on social networks did not lead to good moral behaviours in respect of the samples.

Aspects of good moral behaviours as assessed by the morality scale employed by the study included behaviours, attitudes, habits, lifestyles opposed to theft, murder, substance abuse, womanizing, compassion, robbery, indecency, smoking, narcissism or arrogance, and so forth. However, retention of the second part of the first hypothesis depicting the absence of significant correlation between bad moral behaviour and social media addiction indicated that bad behaviours such as the aforementioned had no significant bearing with addiction to social media in respect of the samples. The coefficients were not high enough to indicate a positive or negative correlation as in the case of the previous finding with respect to good behaviours.

A cross-sectional convenient sample of 23,532 Norwegians completed an open web-based survey in 2016 whose results demonstrated among others that lower self-esteem and narcissism were associated with higher scores on the Bergen Social Media Addiction Scale, explaining a total of 17.5% of the variance. The findings supported the notion of addictive social media use reflecting a need to feed the ego (i.e., narcissistic personality traits) and an attempt to inhibit a negative self-evaluation (i.e., self-esteem). Narcissism is the source trait for arrogance, low humour, rigidity, domineering personality, and inflated self-esteem. According to such a finding, social media addiction could be the reason for such negative (bad) behaviours.

In the same vein, a significant positive correlation when scores on the Bergen scale on social networking addiction were compared with scores on social anxiety, loneliness, and depression in a research by Toung and Poureh (2017) on 400 undergraduate Pakistani samples.

Analysis of hypothesis two which was on the difference between social media addicts and non-addicts in terms of moral behaviour revealed a Chi-square value of 2.003 and a  $p$ -Value of 0.157 at 0.05 level of significance under 1 degree of freedom. Such a result indicates that the  $p$ -Value (0.157)  $>$   $\alpha$  (0.05). Deductively, since there was no significant relationship between both dimensions of moral behaviour and addiction to social media, then addicts

and non-addicts could not be significantly different in terms of moral development. In other words, non-addicts were respondents who had no addiction problem; this made them immune to the perceived effects of social network activities. As this research found that addicts' moral behaviours had no significant correlation with their addiction syndrome, non-addicts then would be automatically unaffected, and this was what the analysis of the hypothesis depicted.

### **Conclusion**

The research concluded that, there was no significant relationship between social media addiction and moral behaviour, and there was no significant difference in terms of moral behaviour between social media addicts and non-addicts among students of Shehu Shagari College of Education, Sokoto.

### **Recommendations**

The following are the recommendations of the study based on its findings:

1. Parents and all guardians anywhere should be aware of the activities and relationships of their adolescent children going on on various social networking platforms. This is despite the absence of a significant correlation between moral behaviour development and addiction to social networks as established by this research. Positive correlation could be found between the variables with some other subjects even within the same environment of Shehu



Shagari College of Education, Sokoto. Watching over childrens' social media activities prevents wrong behaviour formation and modification.

2. Teachers and lecturers should make their students aware of the downsides of social media; and government should control the activities of social networking sites in their respective states so that citizens do not turn them into avenues where they teach violence, extremism, wrong sexual activities and orientations, substance misuse, drug peddling, disobedience to parents and to constituted authorities, and so forth.

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## An Assessment of The Concentration of Heavy Metals in Soils and Vegetables in Fadama Sites Along Farin-Gada Bridge, Jos, Plateau State

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### Abstract

*The study assesses the concentration of heavy metals in soils and vegetables in Fadama sites along Farin-Gada in Jos Metropolis. Samples of vegetables (cabbage and lettuce) and soils were collected from selected Fadama farms and analysis was made for six (6) different heavy metals. These include Lead (pb), Chromium (Cr), Cadmium (Cd), Copper (Cu), Zinc (Zn) and Nickel (Ni). The study site was subdivided into two located at either sites of the River Delimi. Twelve (12) sample points were chosen for all sides of the river (FGB 1-12) for soil samples while six (6) points were chosen for vegetable samples (FGV1-6). These samples were analyzed in the laboratory for heavy metals using Atomic Absorption Spectrometer (AAS) for soils and vegetables and the results were subjected to statistical analysis of Mean, Standard Deviation, Coefficient of Variation, ANOVA, Correlation and Regression. The findings revealed that Lead (pb) and Chromium (Cr) had the highest values of 0.092ppm and 0.08ppm respectively, while Zinc (Zn) and Copper (Cu) had the lowest values of 0.02 and 0.01 respectively. The values were above the WHO approved standard. This may be attributed to the cosmopolitan nature of the area where a lot of human activities are carried out. The study also shows that strong relationship existed between soil and vegetables in the study area, Cu had the highest R2 value of 0.86 while the relationship between vegetables with pb, Cd, Zn, Cr and Ni was weak. The study suggested that the use of chemical fertilizers which contain heavy metals should be strictly based on professional advice and that other likely sources of heavy metals such as water were not included in this research but given attention for further study.*

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### Introduction

Of recent, pollution of general environment has increasingly gathered a global interest. In view of this, contamination of agricultural soils with heavy metals has always been considered a critical challenge in scientific community (Faruk et al., 2006). Due to the cumulative behaviour and toxicity, heavy metals have a potential hazardous effect not only on crop plants but also on human health (Das *et al.*, 1997). To a small extent they enter our bodies via food, drinking water and air. As trace

elements, some heavy metals at higher concentrations can lead to poisoning. Heavy metals are dangerous because they tend to bioaccumulate. Bioaccumulation means an increase in the concentration of a chemical in a biological organism over time, compared to the chemical's concentration in the environment (Lenntech, 2004).

Soil acts as a key component of the natural ecosystems and environmental sustainability largely depends on a sustainable soil ecosystem and any alteration as a result of either pollution or

contamination ultimately alters the ecosystems and agricultural activities are also greatly affected (Hong *et al.*, 2014). Such activities result in contamination in various forms. The contaminants present in the wastewater and soil pose health risks directly to agricultural workers and indirectly to consumers of the wastewater grown product (fodder crops, greens and vegetables), as the long-term application of the wastewater may result in the accumulation of toxic compounds such as heavy metals in soil and plants. In this way the heavy metals enter the food chain of animals and human and cause health hazards (Chandran *et al.*, 2012). So, it is essential to monitor food quality, given that plant uptake is one of the main pathways through which heavy metals enter the food chain.

However, the beneficial and detrimental effects associated with the use of this contaminated water in agriculture are well known. Environmental contamination in some developing countries has been attributed to negative effect of technological developments such as Urbanization and industrialization, with poor planning in waste disposal and management (Rajagana Pathy *et al.*, 2011). The factors that affect the distribution and occurrence of metals in the soil include soil pH, cation exchange capacity (CEC), organic matter content, soil texture and interaction among the target elements (Ojo, 2017). Heavy metals such as Fe, Cu, Zn, Mn and Ni though essential nutrients at trace levels, however, at high concentrations beyond stipulated levels

could be toxic and harmful. Metals such as Pb, Cd and Cr are reported to be non-essential to man (Edebi and Gideon, 2017).

Rivers are known to be the dominant Pathway for metals transport (Ikhuorah and Oronsaye 2016) and heavy metals become significant pollutants of many riverine systems. Waste water contains substantial amounts of toxic metal which create problems. Excessive accumulation of heavy metals in agricultural soils through wastewater irrigation may not only result in soil contamination but also affect food quality and safety (Nasir *et al.*, 2017).

The river Delimi which passes across Jos city is viewed as a receptacle of infinite capacity, but it is now clear that man may be exceeding nature's capacity to assimilate its waste. Henry *et al.*, (2016) observed that pollutants eventually decompose and diffuse throughout the environment. This takes place when organic substances are discarded. When they are attacked by bacteria, they decompose and simply rot. When these heavy metals enter human body, through drinking water or consumption of aquatic organisms and vegetables, it has a tendency to accumulate in particular organs (Even and Ghaffari, 2011). These heavy metals can be toxic at high concentrations, when ingested over a long period of time and affect not only the soils but the vegetable crops grown on the soil (Adewumi *et al.*, 2017).

Due to rapid increase in human population, industrialization, urbanization over the years, human life styles and activities have tremendously affected the environment greatly. One of the most significant impacts is heavy metal pollution of farmlands as it serves as an intimate linkage to human food chain (Hong and Law, 2014). The accumulation of metals in agricultural farmland does not only decrease the productivity and quality of crops grown, but it also threatens the safety of ecosystem and human health in monumental dimension through its adverse effect.

As the world population increases, environmental degradation also increases. Pollution as one of the resultant effects has become a global concern and the need to control it by more information and evaluation of soil pollution is advocated (Henry *et al.* 2016). Sewage water as transported agent, carry heavy metals along with it into the soil which are distributed, deposited and accumulated in different localities (Mahmoud and El-Kader, 2015). Several studies have also indicated the presence of heavy metals in soils, vegetables and water.

According to Lente *et al.* (2014); Mustapha *et al.* (2014) and Alamgir *et al.* (2015), carried out different studies in different locations indicated that heavy metal concentration were above the recommended threshold limits of FAO and WHO where Cadmium (Cd) has a maximum permissible limit (MPL) of 3 µg/ml in soil, Chromium has 100 µg/ml

(MPL) in soil, Nickel has 50 µg/ml and 67.00 µg/ml (MPL) in soil and vegetable respectively, Lead has a MPL of 100 µg/ml in soil and 0.30 µg/ml in vegetable, Zinc (zn) has a MPL of 300 µg/ml in soil and 100 µg/ml in vegetables while Copper has a MPL of 100 µg/ml in soil and 73.00 µg/ml in vegetables.

The Delimi River which drains the greater part of the Jos city is now acting as a combined sewer system into which thousands of tons of garbage of all sorts are dumped, is no doubt contaminated. For instance, the color of the water and the odor emanating from it portrays these elements of pollution in many parts of the river as it flows. Despite this apparent deterioration of the water in the river, it is still one of the major sources of livelihood for the urban and suburban population, serving both domestic and agricultural (Irrigation) purposes.

Furthermore, mining activity can be a risk factor in the contamination of soil, water and vegetables. Studies have indicated mine sites are around farmlands where toxic elements may accumulate in fruits and leaves of arable and cash crops, and that soil contamination in mine sites can cause severe heavy metal contamination of water sources and poisoning of humans and animals, if ingested (Bartrem *et al.*, 2015). The mining areas of which some streams drained to Delimi River is an added pollution to the water.

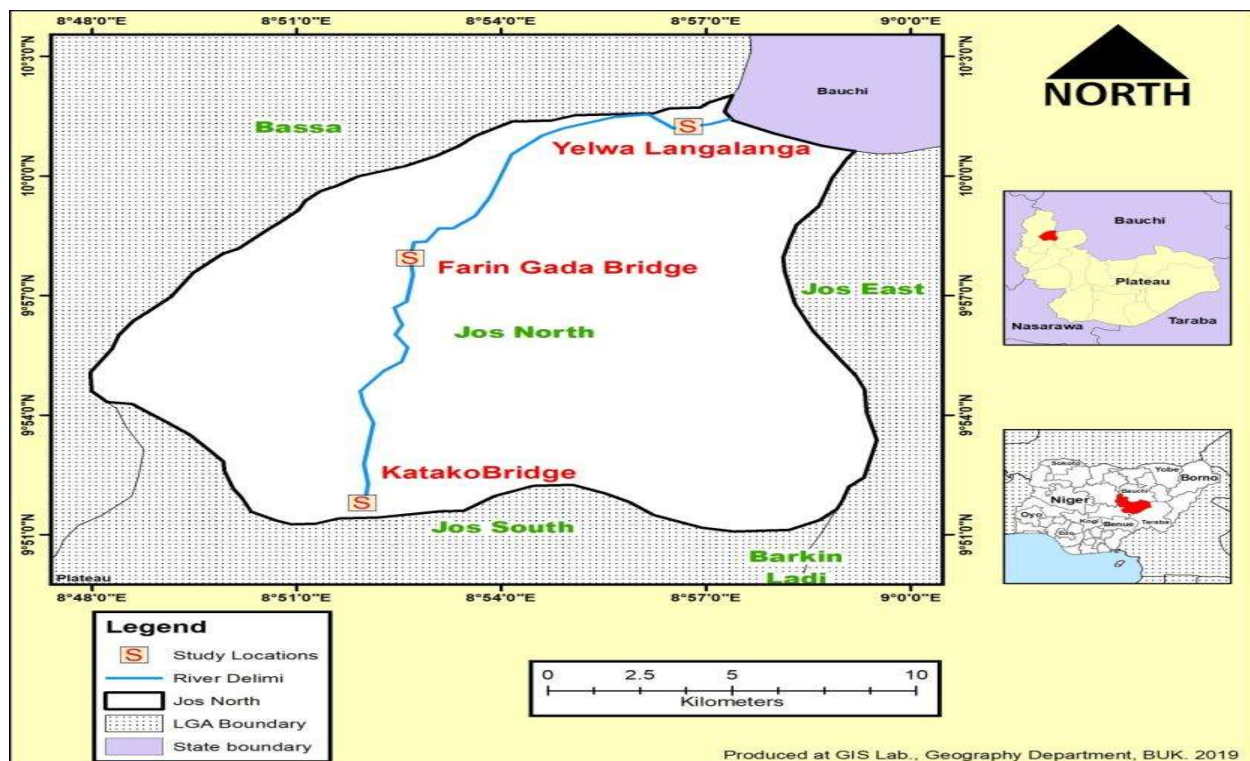
From the foregoing, it has been demonstrated that the use of industrial effluents and wastewaters for growing of

vegetables have serious impacts in contamination of soils by heavy metals and subsequent accumulation of metals by vegetables. A number of research have been carried out on the concentration of heavy metals of certain crops around Jos and its environs. All these researches were carried out 5-10 years ago. Frequent assessment of heavy metals in the soil is very pertinent to be considered because of the continuous accumulation of the heavy metals in the area which may reduce the quality of soil and affect the ecosystem. Also, some of these studies considered the concentration of heavy metal in soil only; some in water only while some in vegetables. However, considering the

concentration of heavy metals in soils and vegetables is very important to determine the level of bioaccumulation in the vegetables.

### Study Area

The study area is located between Lat.  $9^{\circ}51'N$  to  $10^{\circ}3'N$  and Long.  $8^{\circ}48'E$  and  $8^{\circ}67'E$  (Fig 1). The Plateau surface occupies an area of some 8600km sq (Alford *et al.*, 1979) lying at about 1,200m and rises above 1400m to the south of Barkin Ladi and the east of Jos (Potter *et al.*, 2002), and is bounded by 300-600m escarpments around much of its circumference.



**Fig 1:** Jos North showing River Delimi and Sample site

**Source:** GIS Lab, Geography Department, BUK 2019.

The climate of the Plateau differs markedly from that of the surrounding plains. The seasonal migration of the Inter-Tropical Convergence Zone (ITCZ) governs the sequence of three seasons: a cool dry season (October to February), a hot season (March, April) and a wet season (May to September) (Alford *et al.*, 1979). Mean monthly temperatures range from 20 to 24°C (Potter *et al.*, 2002). The relief of the Plateau and the direction of the air flow mean that rainfall is far from being uniform. The highest totals occur on the hilly western margin (particularly the south-western margin) and the lowest on the eastern

plains of Panyam and Pankshin (Alford *et al.*, 1979).

Jos, at an altitude of 1,285m has a mean annual temperature of 21.8°C, ranging from 20.2°C to 24.3°C (mean monthly temperatures). Mean annual rainfall is 1,413mm and the rainy months (May to September) are each characterized by approximately 200 to 300mm (the peak rainfall period is July, with 321 mm). Outside of these months, rainfall drops off sharply (Alford *et al.*, 1979). Higher rainfall may occur locally around the Shere Hills. The rains start in April and stops in October.

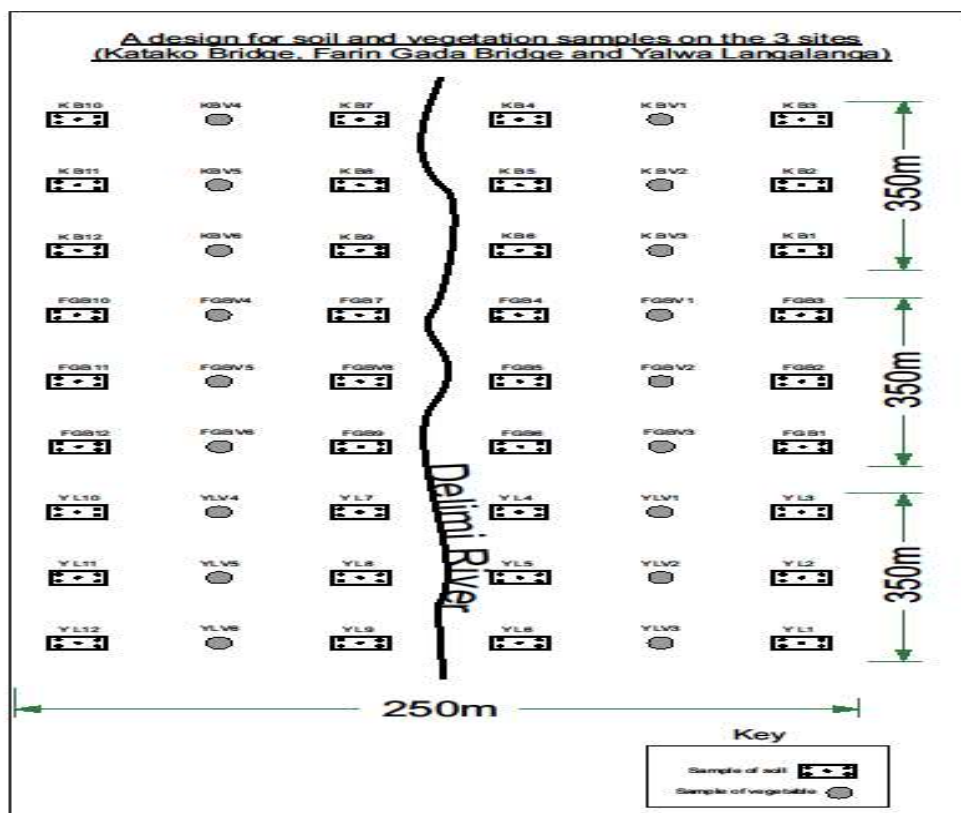


Figure 1 Fig. 3. A design for Soil and Vegetable samples along Farin-Gada bridge

The Jos Plateau is considered the 'hydrological centre' of the country. The

drainage is radial and the watersheds of three major river systems of the country

come together at a point near Rayfield. The Delimi River drains to Lake Chad; the Gongola, Wase, Shemankar, Ankwe and Mada Rivers drain into the Benue, and the Kaduna River into the Niger (Alford *et al.*, 1979).

Having selected the 3 sites using GPS, the sites were mapped and further sub divided into plots at the left and right sides of the river banks, 10m away from the river. The sites range from 2-3 ha in size. Each site (location) was then divided into plots where twelve (12) sample points were selected for soil samples, six points at either side of the river (fig 3.0). For vegetable samples, twelve (12) points each

were selected for each location, three (6) points in each side of the river. All these were done using purposeful sampling technique for point composite. Each sample point was 100m separated from the other for both soil and vegetable samples in all the sites.

Twelve soil samples of soil and vegetables were taken from each location giving a total of 36 sample points for both soil and vegetables. The leaves of the vegetables (Cabbage and lettuce) were taken for the study. The exact sampling sites were established using GPS in order to get the exact location of the sampling sites.





**Fig 2:** Map of Farin-Gada bridge showing Fadama Site

**Source:** Google Earth, (2019).

### Soil samples

Soil samples were taken at the depths of 0-15cm for all the sample points. Samples were collected into polyethylene bags, labeled and properly tied. In the laboratory, the soil samples were spread on glass plates and then dried in an oven at 60°C for six hours. The dried soil was grounded and sieved through 2mm mesh sieve for the analysis of heavy metals as Cd, Cr, Ni, Zn, pb and Cu. One gram each of the ground soil samples was weighed into a 125 ml beaker and digested with a mixture of 4 ml, 25 ml and 2 ml each of concentrated HClO<sub>4</sub>, HNO<sub>3</sub> and H<sub>2</sub>SO<sub>4</sub> respectively, on a hot plate in a fume cupboard. On completion of digestion, it was cooled and 50 ml of de – ionized distilled water was added and then the samples filtered. The samples were made up to 100 ml with de-ionized distilled water and concentrations of the elements determined using atomic absorption spectrophotometer (AAS Model SP 9 Unicam 1984). This analysis was done at the National Research Institute for Chemical Technology (NARICT) Zaria for analysis of heavy metals in soils, vegetables and physiochemical characteristics of soil. Descriptive statistics such as mean was used and also inferential statistics such as Standard Deviation and Coefficient of

Variation were used in this research. The relationship between heavy metal in soil and vegetable was evaluated using Correlation and Regression analysis at  $p \leq 0.05$ .

### Vegetable samples

Samples of the leaves of vegetables (Cabbage and lettuce) were collected into labeled polythene bags and taken to the laboratory for analysis of heavy metals (Cu, Cr, Pb, Zn, Cd and Ni). One gram (1gm) each of milled/grounded homogenized samples was weighed with a digital weighing balance into a conical flask and digested in a mixture of 4ml, 25ml, 2ml and 1ml of concentrated HClO<sub>4</sub> and 60% H<sub>2</sub>O<sub>2</sub> respectively, at 100°C on a hot plate for two hours in a fume cupboard. The resulting solution was left over night and made up to 100ml with deionized distilled water and concentrations of the elements were determined. The guidelines for Maximum Limit (ML) of heavy metals in vegetables were adopted from World Health Organization (WHO) standard and FAO/WHO (2007). This analysis was done at the National Research Institute for Chemical Technology (NARICT) Zaria to determine the heavy metals (Cu, Cr, Pb, Zn, Cd and Ni) in soils and vegetables under study using the Atomic Absorption Spectrophotometer (AAS).

## Results and Discussion

**Table 1. Levels of concentration of Heavy metals in soils along Farin-Gada bridge (FGB)**

Location	Pb(ppm)	Cd(ppm)	Zn(ppm)	Cu(ppm)	Cr(ppm)	Ni(ppm)
FGB1	0.0213	0.0142	0.0263	0.0061	0.0134	0.0073
FGB2	0.0021	0.0321	0.0251	0.0053	0.0722	0.0042
FGB3	0.0142	0.0227	0.0209	0.0096	0.0961	0.0116
FGB4	0.0212	0.0152	0.0237	0.0122	0.0611	0.0084
FGB5	0.0102	0.0232	0.0199	0.0116	0.0893	0.0163
FGB6	0.0267	0.1037	0.0285	0.0131	0.0193	0.0148
FGB7	0.0136	0.0117	0.0263	0.0084	0.0844	0.0182
FGB8	0.021	0.0121	0.0262	0.0113	0.0662	0.0093
FGB9	0.0312	0.0127	0.0219	0.0074	0.1173	0.0141
FGB10	0.021	0.0219	0.019	0.0083	0.1641	0.0122
FGB11	0.0421	0.1028	0.0261	0.0073	0.1152	0.0091
FGB12	0.0331	0.1126	0.0271	0.0063	0.1463	0.0009
mean	<b>0.0214</b>	<b>0.0404</b>	<b>0.0242</b>	<b>0.0089</b>	<b>0.0870</b>	<b>0.0105</b>
WHO Max level in soil	1.0	0.3	3.0	1.0	1.0	0.5

The table above shows that Chromium (Cr) has the highest mean occurrence of 0.0870ppm followed by Cadmium (Cd) with a mean concentration of 0.0404ppm, while Cupper (Cu) has the least mean

occurrence of 0.0089ppm. Comparing these values with WHO/FAO Standards of 1.0ppm and 0.3ppm respectively, it shows that these metals are present in the soil but in negligible quantities.

**Table 2. Levels and Concentration of heavy metals in vegetables at Farin-Gada bridge (FGB)**

Location	Pb		Cd		Zn		Cu		Cr		Ni	
	Cb	Lt	Cb	Lt	Cb	Lt	Cb	Lt	Cb	Lt	Cb	Lt
FGB1	0.959	0.959	0.108	0.101	0.172	0.169	0.163	0.156	0.211	0.217	0.309	0.219
FGB2	1.031	0.992	0.121	0.116	0.078	0.062	0.319	0.193	0.286	0.282	0.319	0.231
FGB3	1.402	1.378	0.098	0.088	0.077	0.062	0.319	0.193	0.286	0.282	0.319	0.231
FGB4	0.955	0.932	0.112	0.097	0.201	0.196	0.271	0.203	0.210	0.190	0.748	0.643
FGB5	1.210	1.210	0.089	0.07	0.089	0.490	0.438	0.367	0.189	0.188	0.645	0.832
FGB6	1.082	0.988	0.215	0.197	0.490	0.322	0.722	0.699	0.199	0.180	0.153	0.178
Mean	<b>1.106</b>	<b>1.076</b>	<b>0.123</b>	<b>0.111</b>	<b>0.184</b>	<b>0.216</b>	<b>0.372</b>	<b>0.301</b>	<b>0.230</b>	<b>0.223</b>	<b>0.415</b>	<b>0.389</b>
WHO standard	<b>0.3</b>	<b>0.3</b>	<b>0.2</b>	<b>0.2</b>	<b>99.4</b>	<b>99.4</b>	<b>1.21</b>	<b>1.21</b>	<b>0.130</b>	<b>0.130</b>	<b>1.00</b>	<b>1.00</b>

**Source:** Researcher's Data (2019).

The table above shows that Lead (Pb) and Nickel (Ni) have the highest mean concentrations of heavy metals at 1.106ppm/ 1.076ppm and 0.123ppm/ 0.111ppm respectively for cabbage and lettuce while Cadmium (Cd) had the least mean concentration of 0.123ppm and 0.111ppm for cabbage and lettuce respectively. Comparing these concentrations with the WHO permissible level, it is evident that Lead (Pb) was found in vegetables far above the standard for human consumption. Though other metals were detected in the vegetables but were at a negligible quantity.

The presence of Lead (Pb) in high proportion in vegetables portent danger to consumers. Research in the past

indicate that, consumption of vegetables with high quantity of Pb has a lot of health risks. Lead may accumulate in bone and lie dormant for years and then pose a threat later. Ingesting leafy vegetables grown in lead contaminated soil, storing acidic foods in improperly-glazed ceramics, battery manufacturing, demolition, painting and paint removal, smelting operations, and many more (Eneche and Sumaila, 2016).

### Distribution of Heavy Metals in Soil

The mean values, standard deviation and CV of the selected heavy metals in all the selected areas were evaluated and presented in Table 1 and Fig 6 respectively.

**Table 3:** Mean Distribution of Heavy Metals and pH in Soil along Farin-Gada bridge

Statistics	Pb	Cd	Zn	Cu	Cr	Ni	pH (Cacl <sub>2</sub> )
Mean	0.0214	0,04	0.02	0.089	0.087	0.0105	6.39
Std. Dev	0.01	0.04	0.00	0.00	0.05	0.01	
CV%	10.86	99.68	12.81	28.6	57.47	100.00	

**Source:** Researcher's Data 2019.

The result in table 3 reveals that Pb (0.092) and Cr (0.08) had the highest mean values at Farin-Gada bridge site as against Cu (0.021) and Zn (0.02) which had the lowest values. The reason for the high occurrence of Cu and Cr was due the fact that Farin-Gada bridge Fadama Site is located within the metropolitan area where a lot of human activities are carried out. Discharge from mechanic

workshops and homes are likely sources of heavy metals within the study area.

The standard deviation was highest for Cr (0.05) and Cd (0.04) respectively. Furthermore, the results showed that Ni (100) and Cd (99.68) had the highest mean values of coefficient of variation. The least Cv occurred in Zn (12.81) and the mean soil pH at KB was 6.39.

### Relationship between Heavy Metal in Soils and Vegetables

The relationship between heavy metals in soils and vegetables in the study sites were determined using Correlation and Regression analysis and presented in Tables 4 and 5 and the result reveals that relationships exist between soil and vegetables in the study area.

### Correlation between metals in soil and vegetables

The relationship between heavy metals in soil and cabbage was determined using was evaluated using correlation statistics and presented in Table 4 which shows that there is a weak relationship existing between heavy metals in soil and cabbage in the study area.

**Table 4:** Correlation between metals in soil and vegetables

Heavy metals	Correlation coefficient ( $R^2$ )	p-values
Pb	0.16	1.86E-07
Cd	0.280	1.19E-13
Zn	0.2530	0.902461
Cu	0.0019	0.000896
Cr	0.0268	1.9613
Ni	0.1087	1.21007

**Source:** Researcher's Data (2019)

The results indicated that Cd (0.280) and Zn (0.253) had the highest relationship while Cu (0.0019) had the lowest relationship. This implies that increase in heavy metals in soil will not cause any corresponding increase in heavy metals in cabbage. The p-values were high in pb, cd, Cr, Ni and Zn but lowest in Cu.

### Coefficient of Determination of Heavy Metals in soil and lettuce

The relationship of heavy metals in soil and cabbage was evaluated using coefficient of determination and presented in Table 5 where the results showed that relationships existed between heavy metals in soil and lettuce.

**Table 5:** Coefficient of Determination of Heavy Metals in soil and vegetables

Heavy metals	$R^2$	Adjusted R	Standard error of Estimate
Pb	0.030	0.001	0.4494
Cd	0.057	0.028	0.131
Zn	0.001	-0.028	0.246
Cu	0.007	-0.022	0.321
Cr	0.031	0.001	0.133
Ni	0.314	0.293	0.197

**Source:** Researcher's Data (2019)

The findings indicated that Ni (0.34) had the highest  $R^2$  value followed by Cd (0.057) signifying a strong relationship between heavy metals in soil and lettuce. Increase in Ni and cd in soil leads to a corresponding increase in lettuce. Heavy metals with weak relationship in the study area included pb (0.30), Zn (0.001), Cu (0.007) and Cr (0.031) which signifies that increasing these heavy metals in the soil does not lead to any increase in heavy metal content in lettuce.

At Farin Gada bridge, the summary of the result reveals that the mean concentration of metals in soil occurred most in pb (0.09) and Cr (0.08) while

Zn (0.02) and Cu (0.01) had the least occurrence the metals occurred in the order pb (0.092)>Cr(0.8)>Cd(0.04)>Ni(0.03)>Zn(0.02)>Cu(0.01). The standard deviation was highest in pb (0.09) and cd (0.06) while Zn (0.010 and Cu (0.00) had the lowest values (Table 1). The coefficient of variation was highest in Cd (135.25) and Ni (106.61) with a mean pH value of 6.37.

Table 6 shows the comparison between heavy metals in the cabbage and lettuce with WHO standards, which revealed that pb (0.99 in cabbage and 1.05 in lettuce), Cr (0.20 in cabbage and 0.21 in lettuce) and Cd in lettuce exceeded the WHO standard.

**Table 5:** Comparison of HM in vegetables with WHO standard

Vegetables	Heavy metals in Mg/kg					
	Pb	Cd	Zn	Cu	Cr	Ni
Cabbage (cb)	0.99	0.14	0.20	0.26	0.20	0.43
Lettuce (lt)	1.05	0.44	0.22	0.32	0.21	0.30
<b>WHO standard</b>	<b>0.30</b>	<b>0.20</b>	<b>99.40</b>	<b>1.21</b>	<b>0.13</b>	<b>1.00</b>

**Source:** Researcher's Data (2018)/WHO International standards (2002)

Other metals such as Zn, Cu and Ni were far below the acceptable international standard. The metal with the least occurrence as compared with the international standard was Zn for cabbage and lettuce.

### Conclusion

Based on the findings, it can be concluded that heavy metals were detected at all the study locations in

soils and vegetables, though at different proportions, however, the concentrations were more in vegetables. Metals like Lead (Pb), Cadmium (Cd) and Chromium (Cr) were seen to have occurred above WHO standards, thereby constituting a serious health hazard to consumers. This was attributed to the fact that the use of farm inputs such as fertilizers, herbicides and fungicides increase the chances of adding heavy metals to the soil.

In order to create a sustainable agriculture, environmental balance and food security, the following recommendations were suggested:

- i. Environmental Protection Agency which is saddled with the responsibility of sensitizing farmers and consumers on the harmful effect of consuming vegetables that contain heavy metals should step up their campaign to reduce the risk of contracting diseases.
- ii. In order to maintain soil fertility, inorganic manure such as farm yard manure, compost and slash and burn ash should be used. The use of chemical fertilizers which contain heavy metals should be strictly based on professional advice.
- iii. The cultivation of certain crops that are known not to accumulate heavy metals should be encouraged and their metabolic mechanisms studied.
- iv. This research was based on two parameters i.e soil and vegetables. Further study could include water to actually ascertain its level of toxicity and consequent harmful effect on humans.

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## Evaluation of the Factors Influencing Students' Performance in Map Reading in Some Selected Public Senior Secondary Schools, Tarauni, Kano State

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### Abstract

*The study investigates the factors that influence Geography students' performance in Map Reading in some selected public senior secondary schools, in Tarauni Local Government Area of Kano. The study was achieved through establishing teachers teaching experience and teaching methodology influences their performance in Map Reading. Twelve (12) teachers of geography who are handling SSS 1-2 and 198 SS II Geography students from six public Senior Secondary Schools in Tarauni formed the sample of this study. Descriptive survey design and purposive sampling technique was employed in obtaining information needed since the researcher is studying events and circumstances that is people's thoughts, feelings and opinions about the nature of existing conditions. The data obtained from the study were analyzed using descriptive statistics on the other hand inferential statistic ANOVA and T-test was used to test the hypothesis of the study. The findings of the study revealed that teaching/learning resources were inadequate in most secondary schools in Tarauni. The study further revealed that text books, cartographic equipments, geography laboratories were inadequate and by large extent some were not applicable in most schools, performance is a function of how factors such as student's characteristics, teacher's characteristics and Teaching/Learning resources interact in the school environment influences students performance in map reading. If the interaction is healthy, the performance should be good. Observed t-value of 28.6 and p-value of 0.01 revealed a significant difference exists between the performances of male and female students exposed with different skills in favour of male students. In conclusion, students' performance in map reading can be improved. Improving performance therefore depends on changing some of these influences pedagogically. The study further recommend that more female teachers to take up a map reading teaching combination because this influences the students decisions especially the female students who want to take up geography as a subject but they have no inspiration from the teachers hence this could affect students' performance and attitude toward map reading, and teaching*

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### Introduction

Education has been universally recognized as the key to sustainable development and the enhancement of human welfare (Egunyomi, 2016). Secondary education is crucial to development because it provides learners with a bridge to highest education as it prepares them for employment and enables

them to continue learning through their lifetime According to (World Bank, 2017). The teacher's ability to deliver the content depends not only on his qualification but also the in-service courses which keep him up to date with the new development. Douglas, (2014); Nkosana (2018) further points out that if teachers feel that a subject is not important to the extent that they do not emphasize teaching it, students may not



be blamed for the same attitude. A study by Glen (2013); Fellman *et al.*, (2015) indicated that the “tips “that were provided by the teachers were often regarded by pupils as the most important things to learn on an examination course. For example, Geography, it is one of the few disciplines that encompass very different ways of knowing from the natural and social sciences and the humanities and which can only be understood better with the aid of maps (Oluoch, 2018).

Cartographers (map makers) are therefore uniquely equipped to understand and address critical problems facing the world. Map Reading is fundamentally interdisciplinary area in Geography. Map Readers are motivated by issues such as social and environmental justice and the efficient, equitable and sustainable use of resources. Maps are the most valuable equipment which student of Geography possesses. Map reading can be defined as “the recognition and identification of map symbols and the comprehension of the geographic features that they represent” (Innes 2018). According to Eshiwani (2017), no school bothered with the extra subjects as they selected the subjects to be offered at WAEC depending on the resources available in the school including teachers. According to Brunner (2012), all learning is based on curiosity or intrinsic motivation.

Research reports and available literature over the years (West African Examination Council, WAEC, 2018) revealed that poor performance among Senior Secondary School Certificate Examination (SSCE) in Geography still persist in the study area. According to the

released result for 2020 National Examination Council recorded failure in Senior Secondary School Certificate Examination (SSCE) in Geography, as only 10 percent of the candidates that sat for the examination scored credit and above. Despite the rationale for teaching geography to attaining the overall education goals in secondary school syllabus, Nigeria still has dismal performance in Geography examinations. This is true in the study area as its performance in WAEC/NECO has been comparatively declining in relation with other humanities. This study attempts to identify the factors that influence Geography Students’ Performance in Map Reading in some selected public secondary schools in Tarauni Local Government Area.

### **Conceptual Framework**

The study developed a framework in which the performance of Public Senior Secondary School students in Map Reading can be improved. Improving performance, therefore depends on changing some of these influences pedagogically, the challenge is to:

- a) Get the learner to believe in his or her personal capabilities to successfully perform a designated task.
- b) Provide environmental conditions such as instructional strategies and appropriate technology that improve the strategies and self-efficacy of the learner.
- c) Provide opportunities for the learners to experience successful learning as a result of appropriate action

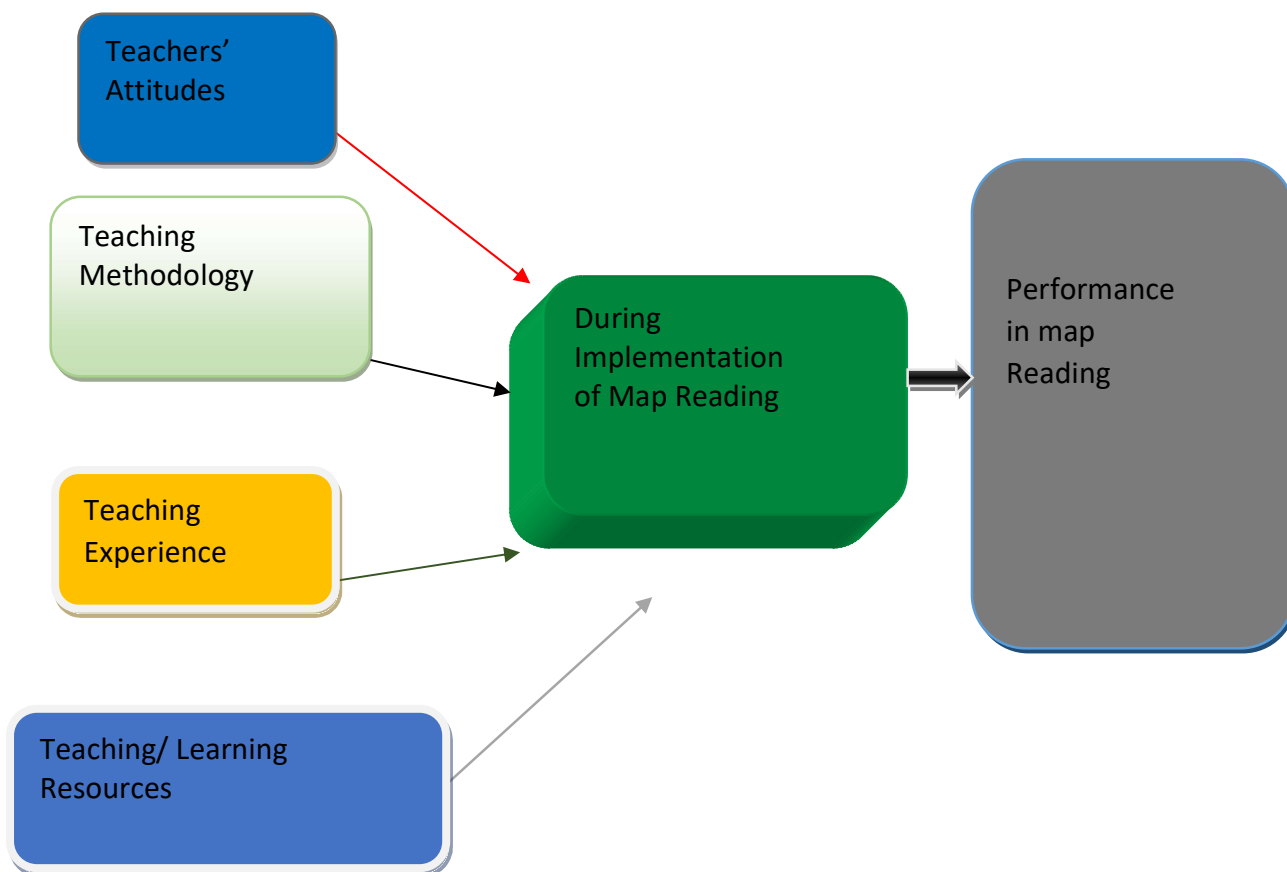


Figure 1: Conceptual Framework

### Methodology for the Study

The study focused on the evaluating factors influencing students' performance in Map Reading in some selected public Senior Secondary schools in Tarauni Local Government Area of Kano. This study basically adopted a descriptive survey research design since the researcher is studying events and circumstances, which had already occurred, and as they exist in schools.

### Population of the Study

The study covered all SS II Geography students in public Senior

Secondary School offering Geography in Tarauni Local Government Area. But for the purpose of sampling, the study purposively sampled 6 public secondary schools in the area, with a population of 240 students at of which four were boys' school and two girls' schools which make the sample for the study, the selected schools were base of the history and the instructors they have in handling map reading in the study area. And the attribute of the population is that majority of the students in the study area are Hausa by tribe, the population cut across gender with average age of 16-17 years. In

this study, two teachers were purposively selected from each school based on years of service and educational qualifications. Considering the main purpose of this study, the most appropriate target population was the group of SS II students who were about to sit for the WAEC examinations were therefore the first category of the target population the respondents who had done the WAEC Geography exams were not captured due to inaccessibility. Instead, the researcher used SS II Students who had not taken their examinations and are available.

### **Sources data and methods**

Questionnaires and interview were used to collect data for the study. According to Mwiria and Wamahu (2013), the choice of a research instrument was determined by the nature of the study, the kind of data to be collected and the kind of target population. Additionally, the researcher examined official records on performance in the sampled schools as maintained by each school which enabled the researcher to identify the past performance in Map Reading as manifested by the schools in order to trace the trend of performance in the subject area in the year 2021. The findings of the study were analysed using tables and charts depicting different categories of information of the research were drawn to show different responses from the respondents involved in the study. On the other hand, inferential statistic ANOVA and T-test was used to

test the hypothesis raised in the study.

### **Result and Discussion**

A total of two hundred and forty (240) questionnaires were administered to the students in six (6) public Senior Secondary School students in Tarauni Area, 198 students out of the 240 expected participated with a response rate of (82.5%). The percentage return rate was averaged to about 83% and it was deemed adequate for analysis and reporting. According to Mugenda (2008), a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent, so from Mugenda (2008), the response was excellent. Analysis therefore was based on the response of one hundred ninety-eight (198) prospective students from public secondary schools and the questionnaire was analyzed corporately in tables under different outline (Table 1).

All the one hundred ninety-eight (198) students under study were in the same year group. It is therefore expected that their ages and levels of reasoning would be almost within a certain range. Hence, they have ages that range between 16 and 17 years. Again, in this study out of the 12 geography teachers sampled, 9 respondents (75%) returned the questionnaires.

**Table 1: Analysis of Questionnaire Distribution in Public Secondary Schools in the area**

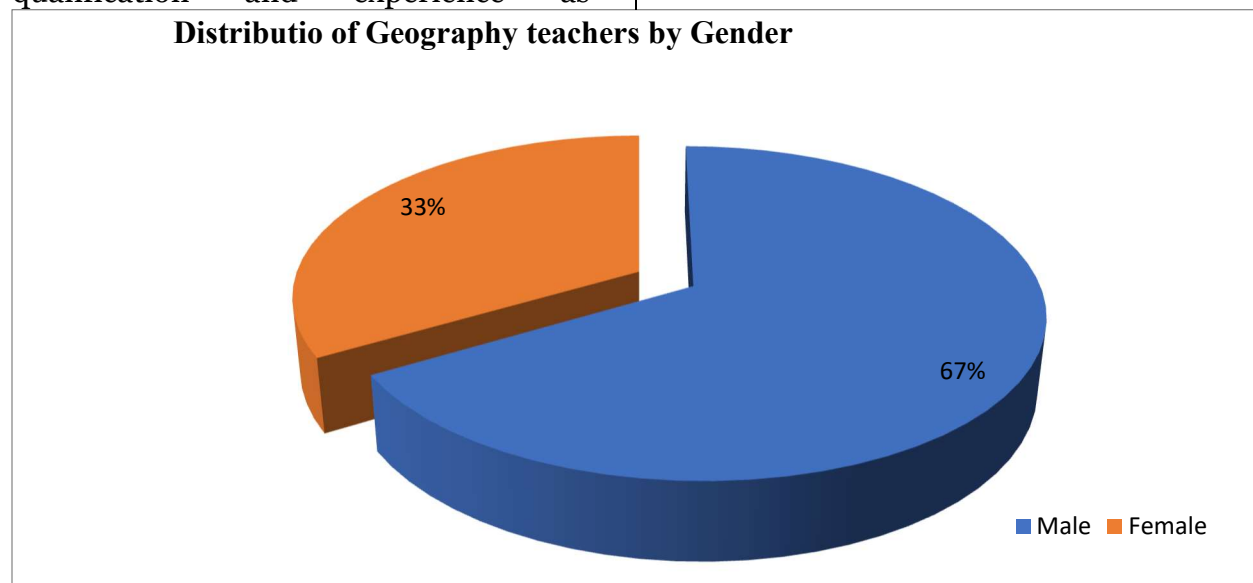
Name of School	Total No. of Students in SS II	Number of Questionnaire Administered	Number of Completed and Return	Number Missing
Tahir Govt. Girls Arabic Sch. Gyadi-Gyadi.	29	29	22	07
Fatiama Mohammad Government Girls Secondary School, Gyadi- Gyadi	38	38	33	05
Government Girls Arabic Secondary School, Taraunin Arewa. <b>(Control group)</b>	19	19	15	04
GDSS Gyadi-Gyadi <b>(control group)</b>	49	49	40	09
GDSS, Kundila	51	51	40	11
GSS, Tarauni.	54	54	48	06
Total	240	240	198	42

Source: Field survey, June 2021

### Demographic data of Geography teachers

The demographic data was based on their gender, professional qualification and experience as

Geography teachers. To establish the gender of teachers, they were asked to indicate it. Their response is presented in figure 2.

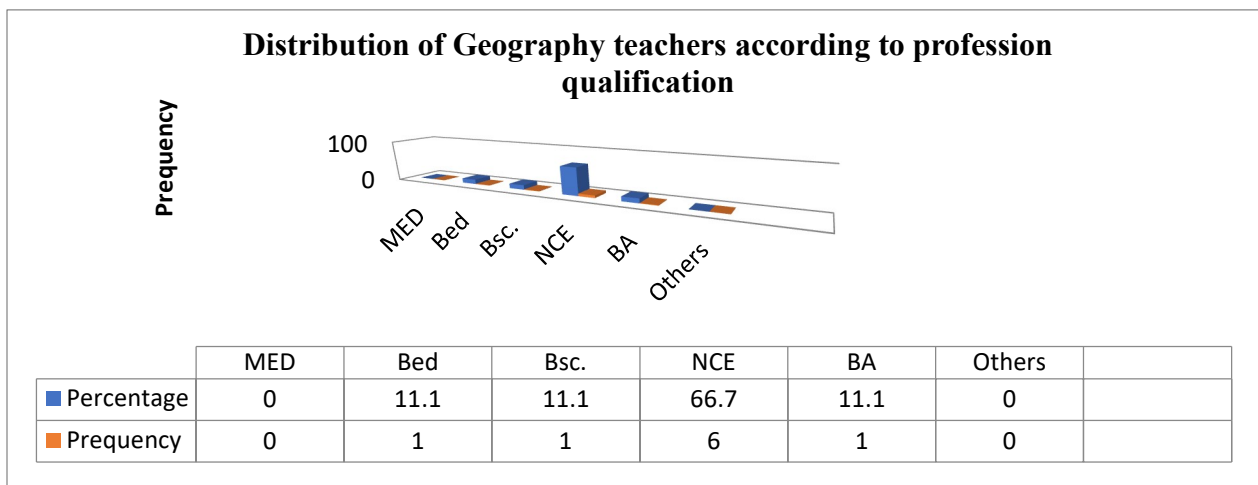


**Figure 2: Distribution of Geography teachers by Gender**

Source: Field survey, June 2021

Data on the gender of teachers indicated that 67% were males as against 33% who are said to be female. The data shows that there is gender disparity in the teachers who teach map reading in public secondary schools in Tarauni. When asked to indicate how teachers' gender influence students decision to full participation in map reading in the school, the respondents indicated that most male teachers tend to be hands-on with map

reading while female teachers tend to not be involved in map reading. In the study area due to the socio cultural setting of the area gender may likely influence the students decisions especially the female students who want to take up geography as a subject but they may no have any inspiration from the teachers hence these could affect students' performance and attitude toward map reading.



**Figure 3: Distribution of Geography teachers according to professional qualification**

Source: Field survey, June 2021.

The results of the map reading teachers on their professional qualifications indicated that majority were holders of NCE with 66.7%, bachelor of education degree with only 11.1% of the respondents, map reading teachers who were Bachelor of Science as well as Bachelor of Art holders were 11.1% of the respondents. This implies that 77% of respondents representing the majority of teachers were qualified, had competent teaching methodologies that influence geography

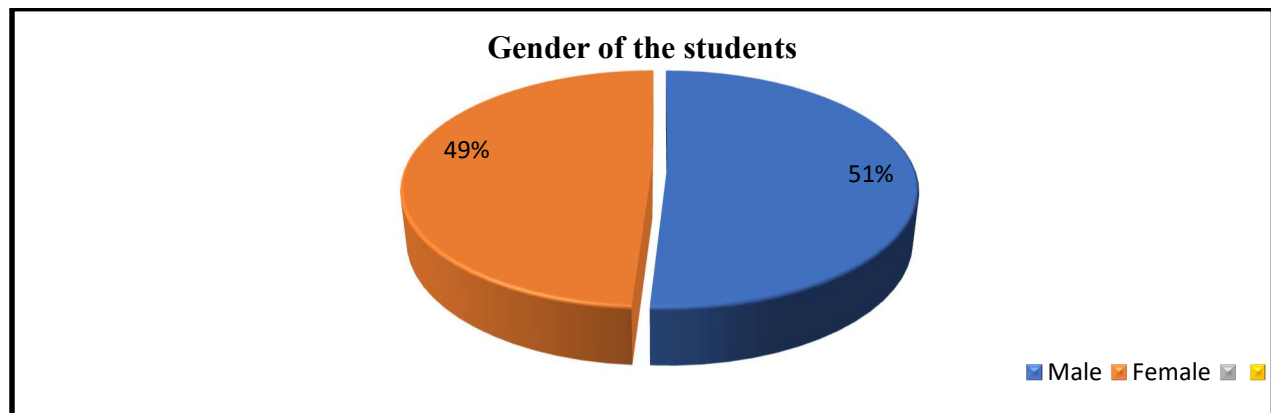
students' performance in map reading and they were resourceful in learning and teaching resources. The study also sought to find out the teaching experience of the map reading teachers. The finding revealed that 36% of the respondents had a teaching experience of over 9 years and for the teachers ability to understand students' attitude towards map reading, their teaching methodology towards the subject and their experience over the years in teaching map reading hence influence

the performance of geography student in  
**Demographic data of Students**

The demographic data was based on their gender and age. On the gender of respondent, 51% students were males while the females were represented by 49% of the respondents. This indicated that the males thrive in geography and prefer the area more compared to the

map reading.

female counterparts. The female students' attitude towards map reading showed that they preferred not to have the subject maybe because it was difficult to understand it and hence the male students dominated the field as shown by the figure 4.



**Figure 4 Gender of the students**

Source: Field survey, June 2021.

### Teaching resources influence on students' performance

Teaching and learning resources were rated on how adequate they were for teaching students. The data is presented in table 2.

**Table 2 Teaching / learning resources**

Learning Resources	Adequate	Inadequate	Mean
Textbooks	4	5	1.4
Field work Equipment	4	5	1.2
Maps Instruments	3	61.3	
Budget For Trips	3	6	1.3
Laboratory	4	5	1.2

Source: Field survey, June 2021.

According to the study findings on whether teaching or learning resources influences geography students'

performance, the geography teachers rated the learning resources as adequately used in the schools. The textbooks and

educational trips were adequate while Maps instruments, field work equipment and laboratory were not applicable in most schools due to inadequate resources to support these facilities of learning.

The results show the quantity of Availability of Maps-Aided Instruction and Laboratory Facilities enriched with lecture method Used in Teaching Map Reading. When compared to standard set by WAEC and STAN which provide a ratio of 5:1 students/facilities ratio, it was discovered that none of the facilities are available in the schools under study. For example, taking the ratio of availability of

topographical maps which has the highest quantity, it was discovered that the number of topographical maps observed is 32 and the population of the study is 240 students in which a ratio, of 8:1 (eight students per Map) was observed which deviate from standard set by WAEC and STAN (5:1). This study is in conformity with a study conducted Abdulkarim (2010) conducted on assessment of facilities for teaching geography in Secondary schools of Kaduna state where the study revealed inadequacy of the teaching facilities.

### **Influence of teaching methodology on students' performance in map reading**

The study sought to establish the teaching methodology students felt were most influential in students' performance in map reading. The table 3 shows the frequency of how the students selected frequency of the use of teaching methodology and the calculated mean.

**Table 3: Influence of teaching methodology on students' performance in map reading**

<b>Teaching Methodology Mean</b>	<b>Quite Often</b>	<b>Often</b>	<b>Less often</b>	<b>Never</b>	
<b>Students</b>					
Lecture Methods	94	57	27	20	1.58
Discussion	52	65	42	39	2.34
Question and Answer	25	28	121	24	2.05
Demonstration	28	37	119	34	2.45
<b>Teachers</b>					
Lecture Methods	2	5	2		1.89
Discussion	2	2	4	1	2.21
Question and Answer	4	3	2		1.84

Demonstration	4	3	1 1	1.79
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Source: Field survey, June 2021.

Majority of the respondents said that lecture method was most used hence it is most influential in their performance. The table shows that lecturer method was quite often utilized with a mean of 1.58. The students preferred demonstration teaching methodology because it provided room for study ahead of the class for better understanding. Reading before class improved on the students' attitude towards the area and it was a way of utilizing the learning resources such as books provided by the school hence influencing students' map reading performance.

On the other hand, the study sought to find out the teaching methodology that is often used by the map reading teachers in their schools. The study found out that lecture method was often used with a mean of 1.89. The table above shows how frequent teaching methodologies were used in map reading classes. From the study findings, the teaching and learning resources influenced students' performance by providing the best resources and suitable teaching methodologies, the students' and teachers attitude towards map reading hence a general improvement in performance of map reading. The curriculum implementation theory propounded by Fellman *et al.*, (2015) states that implementation of any educational programme envisages inter alia the question of teacher competence and capability as well as compatibility with the

organizational arrangement and the clarity of the implementer (teacher) on what is to be done. The training of teachers, which is mainly attached to one's qualification, goes a long way in equipping the teachers with knowledge and skills to enable them handle the task ahead of them.

According to the study findings, students felt that teaching method is most effective and was employed in teaching map reading in class as shown in the table above. Majority 66% of respondents felt that lecture was the most frequently used method employed in map reading class with a mean of 1.58. The students indicated that the most frequently used method of teaching in their schools was lecturing hence it was employed as a teaching methodology that influenced geography students' performance in map reading.

### Hypotheses Testing

**Null Hypothesis (H<sub>01</sub>):** There is no significant difference between the mean academic performances score of students taught Map Reading using Maps-Aided Instruction and Laboratory Facilities enriched with lecture method and those taught the same concept using lecture method. In order to test this hypothesis, Analysis of Variance was run using SPSS software version 17.1 and the result is presented in Table 4, where F-ratio of 103.41 was calculated and found to be significant at 0.05. The null



hypothesis was rejected and there is significant difference between the mean academic performance of students taught map reading using Maps-Aided

Instruction and Laboratory Facilities enriched with lecture method and those taught the same concept using Lecture Method.

**Table 4: ANOVA for the difference in performance of student in Experimental and control groups**

Source of variation	Sum of Squares	DF	Mss	S-ratio	p	Remarks
Between groups	633.54	1	633.54			
Within groups	842.33	2	421.34	103.41	0.01	Sig
Total	1475.87	3				

**F cal=103.41; F crit=24.31. F calculated > F Critical at 0.05 Level of significant**

Table 5 presented the source of variance in the mean academic performance score of students taught map reading using maps-Aided Instruction and Laboratory Facilities enriched with lecture method

(experimental groups) and those taught the same concept using Lecture Method (control group ). The test revealed the direction of difference in favour of experimental groups.

**Table 5: Scheffe Test for Direction of difference in Performance of student in Experimental and Control Group**

N1	N2	N3	X2	Msw	F	F cal	F <sup>1</sup>
68	60	70	18.3	421.34	29.5	24.31	8.24

F-cal 24.31 F-value required for significant (F)= 8.24. F Value to be significant at 0.05 Level, H<sub>0</sub>1 rejected.

This shows that geography students taught map reading using Maps-Aided Instruction and enriched lecture method performed better than their counterpart taught the same concept using Lecture Method only. The finding is in congruence with that of Parrot (2012) who observed that, Material-Aided Instruction such as internet system gives students access to wide range of

information and knowledge about environment, socio-cultural, economic and other aspects of life of the people in various parts of the world. The two strategies are gender friendly. However, there exists significant difference between the mean academic performance scores of male and female students' taught map reading of geography using Lecture Method only. Male and female

students exposed to different Teaching Methodology Instruction and Laboratory Facilities did not differ significantly, but there exists significant different between the performance of male and female students exposed to Different Method.

The findings supported studies such as that of Bichi and Usman (2010); Areola, (2018) who in their separate studies found that innovative teaching strategies with integrated resource materials enhance students' performance irrespective of gender. Bichi and Usman (2010) further supported the result of finding in his

study "relationship between students' performance and their academic performance using NISTEP mode of teaching who revealed that senior secondary male and female students will not differ significantly in their performance when exposed to innovative strategies. Furthermore in the discipline of geography, Obeka (2010) revealed that the use of innovative strategies in environmental education concepts of geography proved to be effective in enhancing the performance of male and female students and are gender friendly.

**Table 6: T-Test Analysis of Male and Female Student in Experimental Group**

Variable/Group	N	Mean	SD	Df	t	p	Remarks
Male	33	29.41	5.02	68	28.6	0.01	Significant
Female	37	13.09	3.90				

Significant at  $p \geq 0.05$

From the result presented in Table 6, t-value observed was 28.6, while the p-value observed is 0.01 which is less than the alpha value. This shows that there is significant difference in the performance of gender exposed to Map Reading using different teaching methodology in favour of male students as indicated by their mean score. As a result, there is no significant difference between the performances of male and female students exposed to different teaching methodology. However, significant difference exists between the

performances of male and female students exposed with different skills in favour of male students.

### Conclusions

The findings obtained from the Geography teachers and students indicated that teaching/learning resources were inadequate in most secondary schools in Tarauni. The study further revealed that text books, cartographic equipments, geography laboratories were inadequate and by large extent some were not applicable in

most schools. The study also established that students' attitude towards Map reading largely contributed to the performance of the students in the schools, availability of learning resources to both the students and teachers also contributed to the performance of map reading in the schools. Gopsill (2016) adds that people learn to teach in part, growing up in a culture by serving the apprentices for 12 years or more when they themselves were student. When they face new challenges of the classroom, they often abandon new practices and revert to the teaching methods their teachers used. The negative attitude therefore jeopardizes professional standards by influencing effectiveness of teaching methods and performance of students.

The study concludes that students' performance in map reading can be improved. Improving performance, therefore depends on changing some of these influences pedagogically, the challenge is to; get the learner to believe in his or her personal capabilities to successfully perform a designated task; provide environmental conditions such as instructional strategies and appropriate technology that improve the strategies and self-efficacy of the learner and provide opportunities for the learners to experience successful learning as a result of appropriate action. According to Bandura's (2011), a person's attitudes, abilities and cognitive skills comprise what is known as self-efficacy. Virtually all people can identify goals they want to accomplish, things

they would want to change and things they would like to achieve. People with strong self-efficacy: view challenging problems as tasks to be mastered, develop deeper interest in the activities in which they participate, form a stronger sense of commitment to their interest and activities and recover quickly from setbacks and disappointments. Head teachers, geography teachers and students alike have the capacities to change this dismal performance of map reading.

### **Recommendations**

Based on the findings presented above, the study makes the following recommendations:

- More female teachers to take up a map reading teaching combination because this influences the students decisions especially the female students who want to take up geography as a subject but they have no inspiration from the teachers hence these could affect students' performance and attitude toward map reading. The government through the NUT should recruit the teachers.
- The government should take an initiative to ensure that the problem of inadequacy of teaching /learning resources is eradicated.
- There is need to sensitize the parents and the community on the provision of adequate teaching /learning resources in public secondary schools. The government should endeavour to source funds from donors, well-wishers, and NGOS to diversify

provision of appropriate facilities. This will supplement funds released from the government kitty which is insufficient to put in place learning resources for geography education. These resources should be readily available for both the students and teachers for study, understanding and research reference for geography.

- The teaching methodology should be well diverse to cater for the needs of the students. To achieve this, the government should provide funds for re-training of geography teachers, as the findings revealed that a good percentage of the teachers had not attended any in service training in the recent past.

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## Impact of School-Based Professional Development Programmes on the Performance of Teachers in Public Secondary Schools in Bauchi State

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### Abstract

*This study examined the extent to which principals' implement the school-based teacher professional development programmes in public secondary schools in Bauchi state. The study also attempted to determine if school-based teacher professional development programmes have significant impact on performance of teachers. Survey and causal designs were employed for the study. Population of the study comprised all the teachers and principals of public secondary schools in the study locale. Simple random sampling techniques was utilized to select the sample of 375 teachers and 29 principals for the study. Structured questionnaire and document observation checklist were used for data collection. The reliability of the instrument stood at 0.9. Cronbach Alpha. The data collected were analysed using descriptive statistics and simple linear regression. The hypothesis in this study was tested at  $\alpha=0.05$  level of significance. Findings of the study revealed that school-based teacher development programmes were not adequately implemented in public secondary schools in Bauchi state. The study also established that school-based teacher development programmes have significant impact on pedagogic performance of teachers. Consequently, the hypothesis that school-based teacher development programmes have no significant impact on performance of teachers in public secondary schools in Bauchi state was rejected. The document analysis findings revealed that activities related to professional development programmes were not adequately planned and recorded in public secondary schools in Bauchi state. Based on the findings of the study, it was recommended that the Ministry of Education, Bauchi state should provide principals with training and funds to budget for effective execution of such programmes as teacher orientation, school-level workshop, veteran-novice teacher mentorship and in-service education. That as a policy, school-level teacher development should be an explicit part of the mandate of principals.*

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### Introduction

In addition to administrative functions principals are responsible for their teachers' growth. Therefore, apart from undertaking lesson observation to improve teaching, principals are expected to organize and implement programmes

that will foster teacher professional development (Kamal, Yunus & Salomawati, 2012) Such programmes as in-service education, school-level workshops, teacher orientation and peer mentoring could be facilitated by principals to support the professional

development of teachers. In an overview of literature on supervision and staff development, Wanzare and Da Costa (2000) conceptualize teacher professional development as a continuous teacher training focusing on improving teachers' instructional techniques, their classroom organization ability, their capacity to adjust teaching to fulfill learners' requirements and setting up a professional culture which is significant in teaching-learning situation.

In a study about teachers' current and desired performance in pedagogy, Ramano (2014) argues that supervising and assessing teaching, checking learners' advancement, ensuring utilization of instructional time and motivation of teachers and learners are parts of principals' roles connected to teachers' professional growth and performance. Ramano Further asserts that promoting teachers' professional development is the most prominent instructional leadership role of school heads at both the elementary and high school levels. These views suggest that principals who focus attention on even a small number of important teacher growth activities can expect a good outcome with teachers.

Nyamwamu (2010), research findings revealed that principals play a vital role in staff development, instructional implementation, and school culture development. School culture implies the existence of a cordial working relationship between school leadership and staff, among teacher colleagues and between students and their teachers.

Sullivan (1997), studies about whether teacher development affect their performance or not, contends that the fields professional growth performance are interlinked. Sullivan further stress that professional growth performance can and should overlap as specific needs prescribe. Regarding the areas to emphasize in teacher development, Sergiovanni and Starratt (2007), in their writing on redefining teachers' development, suggest that teachers' professional improvement programmes ought to provide teachers with the prospects and facilities that will enable them to review their practices individually and collaboratively with colleagues.

Tesfaw and Hofman (2014), investigated the relationship between performance and teacher professional development in Addis Ababa, Ethiopia. Findings of the study established that a strong relationship exists between performance and teachers' professional development. Similarly, Esia-Donkoh and Ofosu-Dwamena (2014), in research on the effect of professional development on performance revealed that teacher development programmes significantly affect teachers' performance in terms of enhancing their experiences in the methodology of teaching, handling of learning materials; managing their students and improvement of their assessment strategies. The study concluded that development programmes foster teachers' instructional skills as well as widens their professional knowledge.

A study by Wanzare, (2012) examines the current condition of teacher growth practices and techniques in public schools in Kenya. The findings of the study revealed that principals were often not prepared to organize teacher development programmes; that they always appeared busy with administrative work. Consequently, teachers' professional development process was jeopardized.

Assefa (2014) examined the implementation teacher growth in public secondary schools of Borena zone, Ethiopia. Findings of the study indicated that the current performance of principals about the implementation of staff development activities was below average. Furthermore, Assefa study revealed that principals do not organize orientation, nor in-service programmes for teachers. The study also revealed that teachers do not have access to professional resources such as researched materials; conferences and seminars were not facilitated by principals. The study concluded that professional development programmes were least performed by principals in Borena zone, in Oromia.

Hussen conducted a study to examine the practices of teachers' professional growth in government preparatory schools in Arsi zone, Oromia Regional state in 2015. Findings of the study revealed that principals' efforts at teacher development practices were weak. Furthermore, the study indicated that only a few of the principals attended a specific course on teacher development. The study also revealed that workshops

and training programmes at school-level were rarely organized by principals. Finally, the study concluded that lack of professional development significantly affects teachers' performance in pedagogy.

Teachers are the light of the society; their development naturally translates into societal transformation (Fullan, 2001; NOUN, 2006). Given this fact, therefore teachers must be up to date to align with the dynamism of the contemporary society. In this regard, Fullan (2001) suggests that teachers of today and tomorrow need to do substantially more learning at work, or parallel with it, where they can always try out, refine, and get input on the upgrades they make. The suggestion by Fullan emphasizes the need for principals to develop a proactive approach in designing and implementing programmes for teachers' professional development. Some scholars have described the orientation of teachers as one of the principals' programme for teacher development. For instance, Okumbe (2001), writing about human resources management in the educational perspective described orientation as an appropriate placement. Okumbe explains further that orientation implies the procedure of coordinating the teachers to both the constituents and the conditions of their employment.

Depending on the needs arise, orientation could be organized for all categories of teachers for development. Orientation processes also serve for adjustment and retention of teachers (NOUN, 2006). Dawo (2011) did an



investigation concentrating on the teacher development in Kenyan schools. The study uncovered that the induction of teachers was an essential element in the professional development of the teachers. This is because induction of new teachers provides practical information on preparations for real teaching work (Dawo, 2011). Likewise, it argued that induction programmes help recently appointed teachers to rapidly understand the scholarly, social, and even the political conditions in their new schools, (Murray, S. & Mazur, X. J., 2009; Wanzare, 2007).

Simatwa (2010), study the orientation needs of newly employed teachers in Bungoma districts in Kenya. The findings of the study revealed that newly employed teachers needed orientation in areas which include knowledge of school policies; knowledge of social and official relationships in their new work environment; classroom management; operation of teamwork and instructional time; learning resources available and how to source them and the recreational facilities available in the school. Furthermore, the study indicated that these processes will enhance teacher performance. In similar studies Sullivan and glanz (2013) and Ahmad et al.(2013) revealed that the way teachers view orientation is a vital factor that determines the end results of the whole process. Also, it was been argued that unless teachers view orientation as a means of enhancing professional growth the exercise will not have the desired effect (Hussen, 2015). This implies that

the way orientation activities are perceived by teachers determines the success or otherwise of the programme.

Mentoring is another programme which principals should focus in an effort to develop their teachers. Mentoring in a school system entail assigning a novice teacher to a highly qualified colleague (veteran teacher) to assist him/her in the improvement of his/her pedagogical practices. In Shanghai and in different areas of China, colleague tutoring has been a conspicuous element of educator training and professional improvement for quite a while (Zhang, 2008). Concerning what peer mentoring entails, Feiman-Nemser and Parker, (1994) article conceptualized peer mentoring programmes as the pairing of novice teachers with increasingly experienced teachers who can capably clarify school strategies, regulations, and methodology; share techniques, materials and different assets; help take care of issues in educating and learning; give individual and professional help; and guide the development of the new educator through reflection, cooperation, and shared experiences. Furthermore, Ingersoll and Kralik (2004) reiterate that noticeable among the few advantages of colleague tutoring is that it enables beginner teachers to end up being effective in their chosen career.

In a study about teacher mentoring in Shanghai schools, Salleh (2013) had observed that mentoring programme for teachers was found in all Shanghai schools and is executed in two primary ways: teacher-to-teacher (i.e., individual)

and congregational mentoring (i.e., by grouping). Salleh observed further that the framework was organized in such a way that the novice teachers are attached to veteran colleagues for guidance in all aspects of pedagogical practices.

Several scholars have explained the concept and nature of teacher mentoring. For example, Sullivan and Glanz (2013) argue that the mentoring process is that which encourages instructional improvement happening. They contend that it is a circumstance whereby the veteran educator (mentor) helps to improve the novice educator (mentee) in cooperative but non-evaluative approaches. Similarly, a study by Murray and Mazur (2009) depicted mentoring as one-to-one correspondence among senior and novice teachers with the aim of fostering the pedagogical practices of the new teacher. The mentee and his mentor are required to work intently. Advancement of the mentee is checked regularly by both mentor and principal. (Murray & Mazur 2009)

### **Statement of the Problem**

There has been a widespread perception by stakeholders and the public that the poor results of Bauchi state public secondary school students in national examinations was due to inadequate teaching. On the other hand, statistics have indicated that among the six states (Adamawa, Bauchi, Borno, Gombe, Taraba, Yobe) that make up the North-Eastern Nigeria, Bauchi state has the largest number of qualified teachers (75%) in public secondary schools

(Federal Republic of Nigeria, 2010). It was also observed that Bauchi state had improved teachers' remunerations and expanded zonal education offices to intensify teachers' performance (Aminu, 2014). Given these efforts, ideally one would have expected a paradigm shift in teachers' pedagogical practices. Yet, available records suggest that performance of public secondary schools' teachers was persistently low. On the other hand, many researchers did not focus on the fact that principals have significant potentials to improve the quality of teachers' pedagogical practices in public secondary schools. Consequently, very little research has been undertaken on how principals implement teacher development programmes and its influence on teachers' pedagogical practices in public secondary schools. This trend necessitated the need to find out the effects of school-based teacher development programmes on teachers' pedagogic performance. This study envisions attracting the attention and support of Education Authorities to provide capacity building for principals to develop their teachers.

### **Objectives of the Study**

- i. To find out the extent to which principals implement professional development programmes in public secondary schools in Bauchi state
- ii. To examine whether planned records of school-based professional development programmes exist in

public secondary schools in Bauchi state

- iii. To determine if school-based professional development programmes have a significant impact on the performance of teachers in public secondary schools in Bauchi state

### Research Questions/ Hypothesis

#### Research Questions

- i. What is the extent to which principals implement professional development programmes in public secondary schools in Bauchi state
- ii. To what extent do principals keep records of planned school-based professional development programmes in public secondary schools in Bauchi state

#### Hypothesis

$H_0$ : School-based professional development programmes have no significant impact on performance of teachers in public secondary schools in Bauchi state

$H_a$ : School-based professional development programmes have significant impact on performance of

teachers in public secondary schools in Bauchi state

### Methodology

This study adopted survey and causal designs. The populations for this study include all the teachers and principals of public secondary schools in the study locale. Random sampling technique was employed to select the sample of 375 teachers and 29 principals for this study. The sample size determination was guided by Krejcie and Morgan Table for sample size. The study used structured questionnaire and document observation guide for data collection. The data from documents observation provided the study with principals' written plans, comments and suggestions related to teacher development in their schools. Descriptive and inferential statistics were used for analysing the data in this study. Using the p-value approach, simple linear regression was utilized to test the study hypothesis at  $\alpha = 0.05$  level of significance. Analysis of the data were presented in tables and texts.

### Analysis and Discussion

**Table 1: Response on Implementation of Teacher Development Programmes**

Principal organizes...	Respondents	Mean	SD	Remarks
Orientation for new teachers	Principals	5.8	6.30	High extent
	Teachers	7.5	7.6	High extent
School-level workshops	Principals	5.8	8.11	Low extent
	Teachers	75.6	81.14	Low extent
In-service education	Principals	5.6	4.83	High extent
	Teachers	74	80.04	High extent
Peer mentoring for novice teachers	Principals	5.8	4.66	Low extent
	Teachers	75	126.6	Low extent

### **Orientation Programmes for Teachers**

The data in Table 1 shows the principals' response, with Mean = 5.8, SD = 6.30, (high extent). This analysis suggests that principals conduct orientation programmes for new teachers. The teachers' response, with Mean = 75, SD = 77.6 (high extent), also suggests that principals organized orientation programmes for new teachers in their schools. The finding was in line with Jeptarus, (2014) study findings which revealed that majority of the teachers sampled confirmed that orientation programmes were regularly organized for new teachers in their schools. Also, a study by Benedict (2013) found that induction of new teachers was regularly practiced by many principals in their schools. Some of the benefits of orientation programmes include enabling the newly posted teachers to acquire knowledge of their new working environment. Through orientation the teacher becomes acquainted with rules and regulations of the school, the facilities available in the school and how to access them (Dawo, 2011 and Simatwa, 2010). Additionally, the National Open University of Nigeria- NOUN, (2006) observes that induction programmes serve for adjustment and retention of teachers. The results of this study indicated that majority of both principals and teachers agreed that orientation programmes were regularly organized in their schools. Therefore, finding of this study suggest orientation programmes for new teachers were implemented by the majority of public

secondary schools' principals in Bauchi state of Nigeria. It was a good development.

### **Workshop Programmes for Teachers**

Regarding school-level workshop the analysis in Table 1, with Mean = 5.8, SD = 8.11, (low extent), this indicates that many principals do not organize school-level workshops for teachers. Also, the teachers' response, with Mean = 7.56, SD = 81.14, (low extent), suggests that workshop programmes were rarely organized by school principals. These results confirmed that school-level workshop was hardly implemented by many principals. In line with the findings of this study, a study by Kedir (2011) revealed that majority of the teacher respondents indicated that their principals never organized workshops for the teachers. Similarly, research by Netsanet, (2014) also found that workshops and training by school heads at school level were rarely organized. In the case of present study findings, the results suggest that majority of principals in public secondary schools in Bauchi state do not organize school-level workshops for their teachers. This situation may affect teachers' performance because workshops are meant to provide teachers with continuous training that will improve their instructional techniques, classroom management skills and ability to adjust to students' needs (Wanzare and Da Costa, 2000; Nyamwamu, 2010; Sergiovanni and Starratt, 2007). In view of the immense contribution workshop makes to teachers' development, principals should prioritize it.

### **In-Service Education Programmes**

The analysis in Table 1 pertaining the in-service education, the principals' response, with Mean = 5.8, SD = 6.30 (high extent), suggests that principals facilitate in-service education programmes for their teachers. The teachers' response, with Mean = 74, SD = 80.04 (high extent), also indicates that principals facilitate in-service education programmes in their schools. This finding was in agreement with some empirical studies in the reviewed literature. For instance, Aseka (2016) and Benedict (2013) reported that the majority of teachers sampled in their studies confirmed that their principal facilitated in-service programmes in their schools to enable teachers acquire higher qualifications (Aseka, 2016 & Benedict, 2013). On the contrary, Tyagi, (2010) study observed that in-service for teachers in public secondary schools was lacking.

Given these results, the findings of this study suggest that many principals in public secondary schools in Bauchi facilitate some form of in-service education programmes to enable teachers obtain higher qualifications. It is hoped that principals would sustain this trend to in order to enhance teachers' performance. It has been observed that teachers must be up to date in order to align with the dynamism of the contemporary society (Fullan, 2001; Nolan and Hoover, 2011; Nnabuo, 2011). Fullan (2001) further contends that teachers need to do substantially more learning at work, or parallel with it, where they can always try out, refine, and get input on their performance. These suggestions by Fullan point out the need

for principals to develop a proactive approach in designing and implementing in-service education programmes for their teachers.

### **Peer Mentoring Programmes**

Analysis in Table 1 regarding peer mentoring programmes in public secondary schools shows the principals' response, with M = 5.8, SD = 4.66 (low extent). The result indicates that many principals never organize peer mentoring in their schools. The principals' response was confirmed by the teachers, with M = 75, SD = 126.6 (low extent). The response of teachers also suggests that many principals never implement peer mentoring programmes in their schools. In congruence with these results, some studies revealed that majority of teachers said their principals did not organize peer mentoring in their schools (Joseph 2014; Hussein, 2015 and Assefa, 2014).

In recent times peer mentoring has been widely accepted as a fast means of improving novice teachers' instruction and interactions among teachers (Zhang, 2008). To this end, Washburn-Moses, (2010) contends that peer mentoring serves to enhance teaching quality and retention outcomes among both novice and experienced teachers. Similarly, Sullivan and Glanz (2000), and Nemser and Parker, (1992) observe that through peer mentoring programmes novice teachers receive professional help and guide from more experience colleague. On their part, Murray and Mazur (2009) argue that in mentoring novice teachers are assisted on one-to-one

correspondence by veteran teachers. Salleh (2013) observed that mentoring procedure covers all parts of instructions.

In summary, the results in Table 1 reveal that orientation for new teachers and in-service education programmes were reasonably performed in public secondary schools. On the other hand, school-level workshop and peer mentoring were least implemented by many principals in public secondary schools in Bauchi state. Gaziel, (2007) reports observed that many principals

neglect their responsibility of teacher development.

### Document Analysis

This section presents information related to the documents observed in this study in the 29 sampled public secondary schools in Bauchi state. Documents on orientation for teachers, school-level workshop, in-service education and peer mentoring were targeted for observation from each of the sampled school.

**Table 2: Document Observation Analysis**

S/N	Professional development programmes	Targeted number of documents	Number of documents available	percentage
1	Orientation for teachers	29	10	3
2	School-level workshops	29	12	3.5
3	In-service education	29	18	5.2
4	Peer mentoring	29	5	1.2

Table 2 analysis shows that out of 29 schools only 10 (3%) of them had documents on teachers' orientation. Also, it was found that majority out of the orientation documents were not properly endorsed by the principals; yet, very few contained constructive comments of the principals. For school-level workshop, the analysis shows that only 12 (3.5%) out of 29 schools had records of planned workshop documents. However, very few of the documents had constructive comments of the principals. Out of the 29 schools sampled for in-service education records, only 18 schools have planned and up to date records. Similarly, it was found that only 9 had valuable comments made by principals.

Concerning peer mentoring, the analysis in Table 2 shows that only 5 (1.2%) out of the 29 schools had records of planned peer mentoring programme. The document analysis findings revealed that many principals in public secondary schools in Bauchi did not keep records on teacher development programmes. It was also found that some of the records were not up to date. Furthermore, the study revealed that very few schools had documented planned activities for teacher development. The analysis revealed that peer mentoring was least performed by plurality of the principals. These findings imply that teacher development programmes in public secondary schools of Bauchi state lacked effective

organisation. Similar studies by Paul, et al. (2016) and Wanzare, (2012) observed that teacher development programmes in public secondary schools lacked consistency.

In summary, the document analysis in this study revealed that very few schools had documents showing a designed plan for facilitating teachers' professional growth at public secondary schools in Bauchi state. In view of these findings, the study concludes that there was need for capacity building for the principals to enable them carry out fully their roles of teachers' professional development.

### **Regression Analysis on Professional Development Programmes and Teachers' Pedagogic Performance**

The hypothesis states:

**H<sub>0</sub>:** School-based teacher development programmes do not have significant impact on pedagogic performance of teachers in public secondary schools in Bauchi state.

**H<sub>a</sub>:** School-based teacher development programmes have significant impact on pedagogic performance of teachers in public secondary schools in Bauchi state.

Simple linear regression analysis was used to test the hypothesis at  $\alpha = 0.05$  significance level. Table 3 below presents the analysis.

**Table 3 The Regression Model Summary for Teacher Development Programmes and Teachers' Pedagogic Performance**

Model Summary				
Model	R	R- Square	Adjusted R- Square	p-value
1	.244	.060	.057	.000

a. Predictors: (Constant), Teacher development programmes  
b. Dependent Variable: Teachers' pedagogic performance

Table 3 shows the R value, ( $r = .244$ ), this indicates a positive correlation between school-based professional development programmes and teachers' pedagogic performance. The R-Square value, ( $R^2 = .060$ ), reveals the amount of variance in teachers' pedagogic performance that could be explained by the school-based professional development programmes. The adjusted R-squared value is used to determine the goodness of the model in

multivariate regression. Given that there was only one predictor variable in this model, the study used  $R^2$  value. This result indicates that 6.0% (.060 multiplied by 100) of the variation in teachers' pedagogic performance can be explained by the school-based professional development programmes. This result suggests that the remaining 94.0% of variability in teachers' pedagogic performance was explained by other factors not included in this

model. The R- Squared ( $R^2$ ) value also reveals some effect size of .060 (Cohen et al., 2011; Pallant, 2013). Presence of this effect size shows that principals' professional development programmes in public secondary schools had a vital

impact on teachers' pedagogic performance. To test the significance of the model, an Analysis of Variance was carried out as shown in the ANOVA Table 4.

**Table 4: ANOVA Test for Professional Development and Pedagogic Performance**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1261.495	1	1261.495	23.651	.000
	Residual	19895.05	373	53.338		
	Total	21156.54	374			

**a. Dependent Variable: Teachers Pedagogic Performance**

**b. Predictors: (Constant), Teacher Development Programmes**

NOTE:  $p < .05$

The analysis in Table 4 determines if this model (which includes teacher development programmes as predictor variable) was a significant predictor of the teachers' pedagogic performance. The ANOVA test shows the results of  $F=23.651$  with 1 and 373 degrees of freedom and  $F$  being significant at less than  $\alpha = 0.05$ . This result provides the evidence that the regression model significantly predicts

the effect of teacher development programmes on pedagogic performance of teachers. The regression equation established from this output may be stated as  $F(1,373) = 23.651, p < .05$ . The equation signifies that the model was significant. Furthermore, regression coefficient (Table 5) provides results on the contribution of the predictor variable (teacher development programmes) to the model.

**Table 5: Regression Coefficient for Teacher Development and Pedagogic Performance**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	53.88	1.294		41.65	.000
a. Teacher development	.342	.070	.244	4.86	.000

NOTE:  $p < 0.05$

In Table 5, the regression coefficient provides information about the change in

the value of the dependent variable (teachers' pedagogic performance)



corresponding to the unit change in the independent variable (teacher development programme). The constant (58.88) represents the y-intercept with a slope of 0.342. The regression equation established from this output could be depicted as: Teachers pedagogic performance (Y) = 58.9 + 0.34 teacher development programme (X). Where Y is the estimated value of the dependent variable and X is the value of the independent variable. The results of the regression coefficient revealed that a unit (1) increase in school-based teacher development programmes would lead to an increase in teachers' pedagogic performance by .342 units. The regression demonstrated that the beta coefficient was significant ( $b = .342$ ,  $t(41.65) = 4.860$ ,  $p < .05$ ).

### **Discussion of Regression analysis Findings for Impact of Teacher Development Programmes on Teachers' Pedagogic Performance**

Simple linear regression was carried out to test whether school-based teacher development programmes significantly influence pedagogic performance of teachers at  $\alpha = .05$ . The analysis result revealed that a statistically significant proportion of teachers' pedagogic performance was accounted for by school-based teacher development programmes ( $R^2 = .060$ ,  $F(1,373) = 23.65$ ,  $p < .05$ ). The study also found out that teacher development programmes that principals implement significantly predicts innovation in teachers' pedagogic performance ( $\beta = .722$ ,  $t(26.95) = 6.330$ ,  $p < .05$ ). Findings of the study therefore

suggest that the impact of school-based professional development programmes on teachers' pedagogic performance was statistically significant ( $p < .05$ ). Based on these findings, the null hypothesis, ( $H_0$ ) that school-based teacher development programmes do not have significant impact on pedagogic performance of teachers in public secondary schools was rejected ( $p = .000 < .05$ ). On the other hand, the alternate hypothesis ( $H_a$ ), that school-based teacher development programmes have significant impact on pedagogic performance of teachers in public secondary schools was accepted.

In view of the foregoing, this study concludes that school-based professional development programmes implemented by principals could lead to transformation of teachers' pedagogic performance in public secondary schools. These findings concur with those of studies undertaken by various scholars. For instance, it has been discovered that, there was a positive and statistically significant relationship between school-based professional development programmes that principals implement and teachers' pedagogic performance (Aseka, 2016; Tesfaw and Hofman, 2014; Esia-Donkoh and Ofosu-Dwamena, 2014). The implication of these findings for practice were that when principals endeavour to implement professional development programmes in their schools, it will assist in fostering effective teaching and learning. Even though professional development programmes are not directly connected to teachers' instructions, they may equip

teachers with relevant instructional skills. Teachers may be motivated through programmes like workshops and conferences to develop confidence in their work and therefore try to excel. In view of these benefits, it is pertinent for principals to facilitate programmes that foster pedagogic performance.

### Conclusion

This study investigated the extent to which principals implement school-based teacher development programmes; assessed records keeping of school-based teacher development programmes and attempted to establish the relationship between teacher development programmes and performance of teachers in public secondary schools. Based on the findings, the study concluded that there was lack of consistency in execution of school-based teacher development programmes and records keeping of such programmes in many public secondary schools. The study also concluded that significant relationship exists between teacher development programmes and pedagogical performance of teachers. Hence, the null hypothesis that school-based teacher development programmes have no significant impact on pedagogical performance of teachers was rejected.

### Recommendations

Based on this study findings, the researcher recommended that the Ministry of Education, Bauchi state should provide principals with training and funds to enhance their capacity for

planning and executing teacher development programmes. Additionally, that as a policy school-level teacher development should be an explicit part of the mandate of principals. Furthermore, the study recommended that principals should give more attention to documentation and proper keeping of teacher development programmes records in their schools.

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## Effects of Teacher Development Programme on Anxiety in Basic Arithmetic Operations among Pupils in Katsina State, Nigeria

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### Abstract

*This study was carried out to evaluate the effects of the in-service-teacher-development-programme on anxiety in basic arithmetic operations among pupils in Katsina state. The study adopted sample cross sectional survey design. This same study's sample size was 700 pupils comprising 358 and 342 male and female pupils respectively, selected from a population of 45,746 pupils in primary five from six Local Government Education Authorities (LGEAs) in Katsina Education Zone – three LGEAs participated in the program (ITDP), with 361 pupils, while the other three did not (Non-ITDP), with 312 pupils. Data was collected using the Abbreviated Mathematics Anxiety Scale (AMAS) – an instrument adapted from Ibrahim and Khatoon (2011) consisting of 30 items. AMAS was validated by experts in Psychology and Math Education. Following a pilot test, the reliability coefficients of AMAS was computed and found to be 0.802. Mann-Whitney U test was used to analyse the data. Findings showed that pupils from ITDP reported less anxiety compared to their counterparts from non-ITDP schools and the intervention's impact was gender balanced as male and female pupils were found to have similar anxiety levels within ITDP schools. Based on the study's findings, it was suggested that the state government consider replicating the program in LGEAs where it was not previously implemented. non-ITDP schools in control LGEAs need to start emulating strategies of the programme and professional bodies popularize strategies of the programme through a series of workshops and conferences.*

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### Introduction

Primary education is regarded as the most important as well as the most popular all over the world

(Lawrence, 2018). This level of education which serves as the foundation of the educational edifice is expected to provide literacy and enlightenment to citizens and it is the key to the system's success or failure. A careful examination of primary education goals reveals that mathematics is required for the majority of them to be met. Sample cut-off marks for admission into Federal Unity Schools for male and female candidates from Nigeria's six geopolitical zones in 2017 and 2018 revealed Katsina state as the

least and consistently below the national merit cut-off marks. Similarly, according to the results of a baseline line survey on Teacher Development Needs Assessment (TDNA) of Teacher Development Programme (TDP) phase 1 states (including Katsina) majority of students fell far short of curriculum expectations in numeracy De, Pettersson, Morris and Cameron (2016). It was not surprising that the same survey discovered that approximately 8% of teachers had sufficient professional knowledge of mathematics (scored 75% or higher) to be considered effective in the classroom when tested on topics covered by class 4 students. Though there are many factors

that influence learning, the quality and effectiveness of teachers are critical to learner success. Fortunately, Katsina State was included in the first phase of the UK Department for International Development's teacher training programme. The Programme was a six-year (2013–19) funded education program aimed at improving teaching quality in primary and junior secondary schools, Oxford Policy Management (OPM, 2017). The program was divided into two parts: pre-service and in-service. The goal of the in-service teacher development program (ITDP) component was to improve the ability of existing teachers to provide quality learning to pupils in primary schools in target areas. The in-service teacher-development component of the programme received approximately 80% of the programme's budget.

Ramirez, Chang, Maloney, Levine and Beilock (2015) observed that even at a young age, children report having math anxiety, which has a negative impact on their math achievement. Brooks (2020) saw math anxiety a feeling of tension and anxiety that interferes with the manipulation of numbers and the solving of mathematical problems in ... ordinary life and academic situations. Mathematics anxiety is a crippling negative emotional reaction to mathematics. Again, Garba, Ismail, Osman and Rustam (2020) revealed that mathematics anxiety is prevalent in Nigeria where students have a fear of the subject and their study found that peers' speech and behaviour can intensify or minimize mathematics anxiety. According to research findings on mathematics anxiety, it is associated more with female learners at different

levels of educational pursuit. Hannake, Tamara, Schleepen and Van den Berg (2019) in a study on 'Gender Differences Regarding the Impact of Math Anxiety on Arithmetic Performance' reported that although boys and girls showed more or less equal levels of math anxiety and performed similarly, correlation analyses revealed that only in females was math anxiety significantly correlated with math performance. Females have higher rates of anxiety at all ages, with the difference becoming slightly more pronounced at the post-secondary school level, though this may be due to females being more willing to admit to feelings of anxiety. Other studies found no gender differences in anxiety levels, possibly due to changing societal attitudes toward girls and mathematics.

Habineza (2019) discovered no significant gender difference in mathematics anxiety; there was no discernible difference in attitude and anxiety toward mathematics based on school status (Government, Government-aided, and Self-financed secondary schools); there was a significant difference between government and privately funded secondary schools (boarding schools, non-boarding schools, and technical schools Vocational Education and Training). Zhou and Liu (2020) investigated the effects of teacher–student rapport on urban and rural students' math learning in China and discovered that, when compared to rural students, mathematics self-efficacy, mathematical academic outcome, and significantly lower mean scores for mathematics anxiety were reported by urban students; teacher-student rapport had a significant effect on reducing

students' mathematics anxiety in both urban and rural schools; however, teacher-student rapport in rural schools increased rural students' mathematics anxiety. Mubark (2021) conducted a study to look into the experiences of rural high school students with mathematics anxiety in academic settings, and the findings revealed that at some point in their academic careers, all students experience mathematics anxiety, frequently, or always.

### Statement of the Problem

Anxiety about mathematics has long been a source of concern in education community that can have far-reaching consequences as primary school children who are anxious about mathematics are a critical group who are more likely to underachieve in the subject. Many people carry their anxiety into adulthood, limiting their career opportunities and passing on their fears to their children. If young children in primary school begin to feel anxious about mathematics, it may be possible to implement measures to counteract this development before they develop entrenched attitudes about mathematics and their own mathematical ability. The conduct of in-service teacher development programme (ITDP) in Katsina State from 2013 to 2019 was perhaps an effective means of improving students' mathematics self-efficacy and helped in reducing mathematics anxiety. This research effort was motivated by the desire to assess the effects of gender and location on pupils' anxiety in mathematics in Katsina State following the conduct of In-service-Teacher-Development-Programme. The study intended to establish whether the conduct

of the professional development programme had closed or widened gaps in learners' anxiety based on gender and location in LGEAs the programme was carried out. Objectives for carrying out the study are listed below.

### Objectives

The following objectives guided the research:

1. To ascertain if a difference exists in pupils' anxiety levels in basic arithmetic operations between ITDP and Non-ITDP schools in Katsina state.
2. Find out the effects of gender on anxiety in mathematics of pupils' taught by teachers who participated in in-service-teacher-development-programme in Katsina state.

### Research Questions

The study posed the following questions for answers:

1. Does mathematics anxiety levels differ among pupils' in basic arithmetic operations between ITDP and Non-ITDP schools in Katsina state?
2. Are there differences in the anxiety levels in mathematics between male and female pupils taught by teachers who participated in in-service-teacher-development-programme in Katsina state?

### Null Hypotheses

For testing at  $p \leq 0.05$ , the following null hypotheses were developed.

- Ho<sub>1</sub>: There is no significant difference in mathematics anxiety levels of pupils taught by teachers in ITDP and Non-ITDP schools in Katsina state.



Ho<sub>2</sub>: There is no significant gender difference in mathematics anxiety levels of pupils taught by teachers who participated ITDP in Katsina state.

### Methodology

The study adopted a sample cross-sectional survey design, and the population of this study comprises 45,746 primary five pupils from six Local Government Education Authorities (LGEAs) in Katsina Education Zone – three LGEAs participated in the programme (ITDP), involving 361 students, while the other three did not (Non-ITDP) with 312 pupils. The study's sample was 700 pupils comprising 358 and 342 male and female pupils. Abbreviated Mathematics Anxiety Scale (AMAS) – an instrument adapted from Ibrahim and Khatoon (2011)

consisting of 30 items was used to collect data. Experts in psychology and mathematics education validated AMAS. Following a pilot test, the reliability of AMAS was determined by single administration and Cronbach's alpha (1951) was computed and found to be 0.802. Mann-Whitney U test was used to analyse the data using Statistical Package for Social Sciences (SPSS) version 20.

### Results

The study's findings derived from answering research questions and testing hypotheses through the analysis of 361 out of 380 questionnaires that were returned.

Research Question 1: Does mathematics anxiety levels differ in basic arithmetic operations between ITDP and Non-ITDP schools in Katsina state

**Table 1: Anxiety Mean Rank for ITDP and Non-ITDP Groups**

Group	N	Mean Rank	Sum of Ranks	Mean Rank Diff.
ITDP	361	238.00	74256.50	184.56
Non-ITDP	312	422.56	152544.50	
Total	673	660.56	226801.00	

Table 4.1 reveals that pupils taught by teachers exposed to in-service-teacher-development-programme expressed less anxiety towards mathematics in comparison to pupils taught by teachers in Non-ITDP schools. From the table, anxiety mean rank for pupils in ITDP group is 238.00 compared to pupils in the Non-ITDP group whose anxiety mean rank is 422.56. The mean difference is 184.56. To determine the difference's statistical significance, Mann-Whitney U test was used to test the first null hypothesis.

### Null Hypothesis One

There is no significant difference between the mean anxiety levels in mathematics of pupils taught by teachers in ITDP and Non- ITDP Schools in Katsina state.

To test this hypothesis, summated anxiety scores of pupils from ITDP and Non-ITDP schools were compared using Mann-Whitney U test statistic. Table 2 displays summary of the results.

**Table 4.2: Mann-Whitney U Test on Anxiety Levels of ITDP and Non-ITDP Groups**

Group	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z-Value	P-Value	Effect Size (d)
ITDP	361	238.00	74256.50	30503.500	-11.644	0.000	0.841
Non-ITDP	312	422.56	152544.50				
Total	673	658.77	226801.00				

Table 4.2 reveals the anxiety level of students whose teachers took part in an in-service teacher development programme was significantly lower than that of pupils taught by teachers who did not participate in in-service-teacher-development-programme. The observed Mann-Whitney U value is 30503.500 with a Z-value of -11.978 and the P-value of 0.000 ( $p < 0.05$ ). As a result, the null hypothesis was rejected, and it was concluded that teachers' participation in in-service-teacher-development-programme significantly reduced pupils' anxiety towards mathematics in ITDP schools in Katsina state. Moreover, the

effect size of the difference between the means of pupils taught by teachers in ITDP and Non-ITDP groups was 0.841 which suggested there was a large effect size between pupils' anxiety levels in ITDP and non-ITDP schools using Cohen (1988) criteria.

To examine descriptive statistics of male and female pupils regarding the effects of in-service-teacher-development-programme on pupils' anxiety in mathematics among treatment schools, anxiety mean ranks for male and female pupils were computed and compared as indicated in Table 4.3

**Table 4.3: Anxiety Mean Ranks of Male and Female Pupils in ITDP Group**

Group	N	Mean Rank	Sum of Ranks	Mean Rank Diff.
Male	186	178.12	33130.00	-5.94
Female	175	184.06	32211.00	
Total	361	362.18	65341.00	

Table 4.3 shows the variation between the mean ranks of male and female pupils in the ITDP group. Female pupils had a relatively higher mean rank towards mathematics compared to males. The mean difference is 5.94. However, to establish whether the mean rank difference is statistically significant, the Mann-Whitney U test statistic for independent samples was used to test null hypothesis four.

### ***Null Hypothesis Two***

There is no significant difference between the mean anxiety levels in mathematics of male and female pupils taught by teachers who had in-service-teacher-development-programme in Katsina state.

To test this hypothesis, anxiety scores of male and female primary five pupils in the ITDP group were compared using the Mann-Whitney U test statistic for

independent samples. Table 4.4 | presented a summary of the analysis.

Table 4.4: Mann-Whitney U Test on Anxiety Levels of Male and Female Pupils in ITDP Group

Gender	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z-value	p-value	Effect Size (d)
Male	186	178.12	33130.00	15739.500	-0.625	0.532	0.057
Female	175	184.06	32211.00				
Total	361	362.18	65341.00				

Table 4.4 reveals that male and female pupils whose teachers participated in the in-service-teacher-development-programme did not differ significantly in their anxiety levels towards mathematics. The Mann-Whitney U value obtained in the test was 15739.000 with a z-value of -0.625. The p-value observed in the test was 0.532 ( $P > 0.05$ ). This result did not provide sufficient evidence for rejecting the null hypothesis. The null hypothesis was therefore retained, and it was concluded that participation of teachers in in-service-teacher-development-programme was gender neutral regarding pupils' anxiety towards mathematics in ITDP primary schools. Moreover, the effect size of the gender difference in pupil means is 0.057 which suggested there was a trivial effect size between pupils' anxiety levels using the criteria by Cohen (1988).

## Discussion

The analysis's findings relating to null hypothesis three revealed that there was a statistically significant difference in the anxiety levels of pupils taught by teachers in ITDP schools when compared with their counterparts in Non-ITDP schools in Katsina state. That means the programme had positive effects in treatment schools of the study area as

pupils from those schools exhibited less anxiety. This outcome tallies with the finding of Middendorf (2018) who carried out a study on the effects of teaching math study skills on the retention of math concepts, math anxiety and math cognition to High School geometry students with a specific learning disability and reported that implementing math study skills correlated with math cognition and decreased math anxiety. Also, Schaeffer, Rozek, Berowitz, Levine and Beilock (2018) in a study on 'Disassociating the Relation between Parents' Math Anxiety and Children's Math Achievement: Long-Term Effects of a Math Application Intervention' reported that access to an educational math application that 1st-grade children and parents used together improved this relation. Again, Garba, Ismail, Osman and Mohd-Rameli (2020) conducted a study on 'Exploring Peer Effect on Mathematics Anxiety among Secondary School Students in Sokoto State, Nigeria Using a Photo Voice Approach' and discovered that negative peer behaviour, such as poor students causing trouble and the use of frightening and discouraging statements in mathematics classrooms, as well as intelligent students dominating the lesson, has a direct effect on increasing mathematics anxiety.

However, Positive peer behavior, such as group discussions and positive advice, was found to reduce mathematics anxiety.

However, in sharp contrast with this finding, Batton (2010) in a quasi-experimental quantitative study which investigated 'The Effectiveness of Cooperative Groups on The Math Anxiety Levels of Grade 5 Male and Female Students' that involved thirty-two students from 2 Grade 5 classrooms who were administered the pre and post MASC inventory and used repeated-measure ANOVA to compare the overall mean difference for each group reported that males in the treatment group showed no change in math anxiety levels when compared to males in the control group. Also, Spaniol (2017) did a study on 'Math Performance and Academic Anxiety Forms, from Socio-Demographic to Cognitive Aspects: A Meta-Analysis' which employed causal-comparative, a correlational study that involved 32 developmental math and 32 college students who were chosen to create equal group sizes for data analyses using independent samples t-test found no significant differences in self-efficacy or anxiety between groups.

The result of the analysis regarding null hypothesis two revealed there was no significant difference between the anxiety levels of male and female pupils taught by teachers in ITDP schools in Katsina state. The finding showed that the in-service-teacher-development programme had no discriminative influence on pupils' anxiety levels. This finding did not support the findings of Hannake, Tamara, Schleepen and Van den Berg (2019) who conducted a study on 'Gender Differences

in the Impact of Math Anxiety on Second and Fourth Grade Arithmetic Performance' involving 124 second- and fourth-grade children (67 girls and 57 boys) and reported that despite the fact that boys and girls had similar levels of math anxiety and performed similarly on arithmetic tasks, an investigation into whether math anxiety moderated the effect of gender and grade on math performance revealed significant differences between boys and girls.. Also, Asikhia (2021) in a study on 'Gender Differences in Mathematics Anxiety among Secondary School Students in Nigeria's Ogun West Senatorial District' reported a significant difference on the effect of gender on students' mathematics anxiety. The study also revealed higher mathematics anxiety levels for male students than females.

However, this finding in part supports Hannake, Tamara, Schleepen and Van den Berg (2019) who studied 'Gender Differences in Relation to Math Anxiety in Second and Fourth Graders' that involved 124 second and fourth grade children (67 girls and 57 boys) and found that boys and girls had similar levels of math anxiety and performed similarly on arithmetic tasks. Corroborating the finding of this study, Gholami, Mohd-Ayub, Yunus and Kamarudin (2021) after the conduct of a study on the 'Impact of Lesson Study (LS) on Mathematics Anxiety and Mathematics Achievement of Malaysian Foundation Programme Students' reported there was no statistically significant interaction between the effects of educational method and gender on both mathematics anxiety and achievement.

## Conclusion

The findings of the study showed that pupils taught by teachers who participated in in-service teacher development exhibited less mathematics anxiety in comparison to their counterparts from Non-ITDP schools and the effect of the intervention programme on gender was symmetrical. Recommendations

In light of the study's findings, the following recommendations were made:

1. The Katsina state government needs to sustain the programme in all treatment LGEAs and extend the intervention into control LGEAs that were not involved *ab. initio*.
2. Effective teaching of mathematics requires competent and experienced teachers, as such state government and LGEAs are required to employ, retain, and incentivize such teachers.
3. Professional bodies like Mathematical Association of Nigeria (MAN) and institutions-based journal ought to promote approaches of ITDP in conferences, workshops, and publication in their journals.

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## Edutainment Approach in Christian Religious Studies Delivery: A New Approach in Nigerian Educational Transformation

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### Abstract

*The study focused on edutainment approach in Christian Religious Studies (CRS) delivery as a new direction in Nigeria's Educational transformation. This is necessary because most of its teaching are accustomed to the use of conventional instruction that focuses on contents transmission with little or no chance for learner's participation rather, students play a passive part. The study employed the use of quasi-experimental research design of non-randomized post-test control design. The target population comprised all the 4,550 CRS students in senior secondary schools in Zaria Local Government Area, out of which 120 CRS senior secondary school students were sampled using purposive sampling technique. Out of the 30 public senior secondary schools in Zaria Local Government Area, 2 intact classes were purposively selected and used in the study. The instrument used for data collection was the Edutainment Aided Christian Religious Studies Achievement Test (EACRSAT). The instrument has 20 question items based on selected CRS concepts. The EACRSAT instrument was pilot tested using Kuder Richardson formula and a reliability index of 0.75 was obtained. The data collected through this instrument was analysed with the use of descriptive statistics of mean, standard deviation and standard error to answer the research question while inferential statistic (Z-test) was used to test the hypothesis at 0.05 level of significance. Findings revealed that edutainment method enhances students' academic achievement in CRS. Recommendations such as suitable edutainment method training programmes should be designed for CRS teachers to empower them on how to use this method of delivery, among*

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### Introduction

Christian Religious Studies (CRS) is a practical and theoretical subject whereby students need to be engage in teaching and learning but what operates largely in senior secondary schools in Kaduna state presently is more of reading, memorization and hearing without engaging students in active teaching and learning. The way a teacher presents a subject matter will make students like or dislike the subject, make them to understand the lesson or otherwise (Yusuf, 2012). Pedagogy approach is what a professional teacher utilizes to maximize students learning. It

includes ways in which teachers do things that cause permanent changes in the students' behaviour. What the researcher observed in the past three decades of teaching Christian Religious Studies (CRS) at secondary and college of education levels is the usage of conventional approach which is mainly talk and chalk.

Christian Religious Studies (CRS) is one of the subjects taught at Senior Secondary Schools across the country. It is aimed at inculcating moral and spiritual virtues into the minds of the learners in order to grow up and abide by provision and teaching of their religion

with the fear of God. In view of the significance of Christian Religious Studies (CRS) to the development of morally sound citizen; the choice of effective teaching approach that will assist in the transmission of religious values and virtues is necessary and vital. As most of its teaching are accustomed to the use of conventional instruction that focuses on contents transmission with little or no chance for learner's participation rather, students play a passive part, memorize, and regurgitate facts and concepts without the basic understanding of what it is. Often, none of these facts were related to life. The students were made to absorb them as a sponge absorbs water (Alasoluyi, Shaibu & Garba, 2016).

However, different instructional approaches develop different skills in the learners, a variety of teaching approaches make the teachers job more stimulating and enjoyable. Pedagogies of Religious education have been explored in Nigeria and elsewhere. Among the various pedagogies that have been studied were confessional (Thompson, 2004), Neo Confessional (Cox in Nalan, 2015), Phenomological (Smart in Heiden & Fassbender, 2010; Ekeke & Ekeopara, 2010), Gift to the child (Hull in Charsky, 2010), Interpretive (Jackson in Mirriam, 2012), Concept Cracking (Cooling in Argan & Sever, 2010), Critical Realist (Wright, 2000), Narrative (Erricker in Nalan, 2015) and life Themes (Onsongo, 2002). Edutainment approach or pedagogy seeks to examine how education and entertainment can transform human beings with refined thoughts and actions with which to make the society a better place for all. Even though edutainment pedagogy has been

extensively used in Europe and elsewhere, there is a dearth in literature on its usage in Africa, particularly Zaria; the scope of this study. This poses a challenge to the author to research into this topic. This paper therefore sought to examine how edutainment approach of Christian Religious Studies (CRS) teachers in Nigeria can affect students' academic achievement.

Edutainment depicts any entertainment that is primed to educate and entertain (Mirriam, 2012). In the context of this study, edutainment is used to mean primarily Christian Religious Studies concepts that are transmitted to the students by means of entertainment through which they are expected to internalize the objectives of the work. The key idea in edutainment is to combine entertainment and education to obtain certain advantages (Singhal & Everett in Argan & Sever, 2010). Edutainment has been conceptualized by scholars as a programme of instruction and training that has the potential to develop an individual's skills to achieve a particular end by boosting his or her mental, moral or physical powers (Singhal in Heiden & Fassbender, 2010).

For a material to be edutainment it must be produced for educational purposes by ensuring that there are educational elements, a possibility to get response, evaluation, and at least implicit interaction related to the material. Singhal and Rogers (2002) have thus stated that even though we are entertained and appreciated to be entertained or we entertain ourselves, edutainment must strive towards education. For example, teachers learn



more about their students in different ways than from the classroom (Nemes, 2002). Entertainment method is a point of engagement, a site of discourse. This perspective implies that exposure of students to entertainment method only may have direct effects on CRS students of the area under study, but that it may cause direct effects on behaviour change leading to interpersonal discussions. This may lead to dialogue, decisions and collective actions, which may influence students' external environment to help create the necessary conditions for social change at the system level in their behaviour (Lawal, 2010).

A study conducted by Anderson, Huston, Schmith, Lineberger and Right (2001), evaluated high school students who had watched the children's educational Programme – Sesame Street at a younger age concerning academic skills, discovered that high school students who watched more educational programming statistically had high grades in English, Mathematics and Sciences, used Literature more often and placed academic performance high on value list of achievement. Levis in Charsky (2010) carried out a study on Information Retention on 13 and 14 years old children in 2000. He observed that students learned more effectively from information presented in the audio-visual provided by video and game in comparison to facts from a printed page. He discovered that more than three quarters of the children absorbed facts contained in a historical video game as opposed to just more than half who were presented with the same information in written form (BBC News, 2012).

### **Research Question**

One research question was raised and answered in the study.

- i. To what extent do edutainment instructional practices affect students' academic achievement?

### **Research Hypothesis**

The hypothesis formulated in the study was tested at 0.05 level of significance.

There is no significant difference in the effect of edutainment method on students' academic achievement in CRS.

### **Methodology**

The study employed the use of quasi-experimental research design of non-randomized post-test control design. This design was aimed at finding out the effect of edutainment method on the academic achievement of students in CRS. It is quasi-experimental because there is no randomization of subjects to treatment conditions, rather intact classes were used. Zaria is one of the Local Government Area in Kaduna State, Nigeria. It has 30 public senior secondary schools with a total population of 1,750 students. For the study, the target population comprised all the 4,550 CRS students in senior secondary schools in the Zaria LGA.

The sample size comprised 120 SS II students from public senior secondary schools in Zaria: 60 students from one intact public senior secondary school and 60 from another intact public senior secondary school. Purposive sampling technique was used to select the two public senior secondary schools used in the study.

One instrument was used for data collection in this study, that is, Edutainment Aided Christian Religious Studies Achievement Test (EACRSAT). The instrument has 20 question items based on selected CRS concepts.

The research instrument was subjected to validity and reliability test. The instrument was given to experts to ascertain how they met the face and content validity. The suggestions given by experts were used to effect the necessary changes to improve upon the validity of the instrument. Thereafter the instrument was pilot-tested to find out their functionality and effectiveness in order to reduce the threat to their internal validity. The threat to external validity

was controlled by making sure that all the participants responded to the same instrument. Kuder Richardson formula was used to determine the reliability index ( $r$ ) of the instrument and a reliability index of 0.75 was obtained. If the reliability index is 0.6 and above it is taken as a measure of internal consistency of the instrument although Uzoagulu (1998), avers that this figure assumes that all items are of equal difficulty.

### Results

The results of the study were tabulated. Descriptive statistics of mean, standard deviation and standard error were used for the analysis to aid comprehensive and holistic discussion.

**Table 1: Students' performance in Christian Religion Studies using Edutainment and Conventional methods of teaching in senior secondary schools in Zaria**

S/No	Teaching methods	Students' performance (%)
1	Edutainment method	68.20±1.54
2	Standard deviation	11.96
	Range	57.00
	Conventional method	31.80±1.78
	Standard deviation	13.77
	Range	48.00

*Data were tested at 95 % level of significance,  $\pm$  = standard error*

Table 1 shows the mean academic achievement of students taught using edutainment method and those taught using the conventional method. The results indicates that students taught with the edutainment method significantly performed better (68.20%) than their counterparts that were taught using conventional method (31.80%). Evidence of this result was further

explained by the standard deviation, 11.96 and standard error, 1.54 in Edutainment method which were relatively lower compared to the conventional method, 13.77 and 1.78, respectively. It therefore implied that the use of edutainment method has high and strong influence in senior secondary school students' academic performance in CRS.

**Table 2: Independent Z-test statistical difference in the academic achievement in CRS of students**

Method	N	Mean	SD	Std. err	df	Z-Cal.	Z-Crit.	Sig. (P)
Edutainment	60	68.20	11.96	1.7776	118	1.028	1.96	.002
Conventional	60	31.80	13.76	1.5441				

*Calculated  $p < 0.05$ , calculated  $Z < 1.96$  at  $df = 118$ ,  $N =$  sample number,  $std. dev. =$  standard deviation,  $df =$  degree of freedom,  $Z-Cal. = Z$  calculated,  $Z-crit. = Z$  critical*

Table 2 revealed that there was significant difference in the effect of edutainment method on students' academic achievement in CRS. The result of this study was evidenced by mean performance of 68.20 and 31.80 for edutainment method and conventional method respectively. The implication of this result is that edutainment method is good and more effective to teach CRS than the conventional method. Therefore, the null hypothesis which stated that there was no significant difference in the effect of edutainment method on students' academic achievement in CRS was rejected.

### Discussion

The result on achievement of students in CRS shows that students taught using edutainment method are higher achievers than those taught with the conventional method. This is in conformity with Yates (2000), who observed that edutainment method improves students learning and their creativity as well as teachers teaching quality. Wolfgang and Grantham (2007) also observed that edutainment method creates motivation and successful

environment for learning. This is also in conformity with Zilfs (2001) who observed that high school students who watched more educational programming statistically have high grades in English, Mathematics and other Sciences.

Reports have shown that performance of students is relatively low with conventional method of teaching than edutainment method (Argan & Sever, 2010; Charsky, 2010; Heiden & Fassbender, 2010; Mang, 2004; WAEC Chief Examiners' reports, 1999-2007; Etete, 2016). The findings are also in conformity with Lewis et al. (2000) and Marbach (2001) who revealed students' low achievement in the control groups due to such reasons as: Teachers' compartmentalization of subjects, inadequate preparation of students by teachers and lack of proper teaching methods as well as the abstractness of the subject matter. This work is also consistent with the work of Isuwa (2014), who observed that candidates in the experimental group are higher achievers in achievement tests. From the above results it can be deduced that learners from the experimental group performed better than

the control group because they had head and heart training orientation, unlike the control group that had passive learning.

### Conclusion

From the result of the study, it could be asserted that edutainment method is the best and effective method of teaching and learning CRS concepts in schools as it enhances achievement in the subject. It is also accepted as a result-oriented method to teach and learn CRS concepts in both public and private schools.

### Recommendations

From this study the following recommendations are made:

- i. It is strongly recommended that edutainment method should be recommended to National Education Policy formulators who will in turn recommend it to curriculum planners to include it in the curriculum of not only CRS but also other subjects/courses.
- ii. Teachers and education administrators should emphasize and encourage teachers on the use of edutainment method in secondary schools.
- iii. Suitable edutainment method training programmes should be designed for CRS teachers using this method of delivery.

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## A Thematic Review of Societal Values for Social Transformation and Development in Nigeria

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### Abstract

*A key issue in societal values for social transformation, such as good behaviour, dignity, education, honesty, humanity etc., stress that Nigeria faces various forms of social issues and societal issues that need urgent attention from the government and its citizen. The growth and development of any nation across the globe depend on the degree of incorruptible governance and good leadership, as stated in the functionalist theory of social change, which sees the society as a whole and that all parts of a society must be harmonious for it to function properly stating that each part is like an organ and individual parts can't survive on their own without the other. Therefore, it is essential to know that collective effort in the fight to eradicate social vices is fundamental for society's survival. The magnitude of corruption led to the birth of crimes of various forms and a high degree of insecurity in the nation. This paper examines concepts like corruption, societal issues, development and value orientation, national development problems, and social vices' impact on society. The paper proffers various ways of eradicating corruption in Nigeria. Some of the recommendations include the eradication of money politics and godfatherism for political office seekers, affordable fees for applications to political offices at elections should be ensured, and the strengthening of anti-corruption institutions such as the EFCC and ICPC to deepen the fight against corruption amidst public office holders that are found wanting. The paper further noted that the war against social vices must be a collective responsibility involving every member of society for societal*

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The socio-economic condition of our society today is faced with numerous problems that range from tribalism, nepotism, corruption, favouritism, cultism and a host of others. These problems have led to various issues affecting the country's economy as most citizens are engaged in sharp corrupt practices that have retarded the growth and development of the country. Social vices have hindered Nigeria's

development, ravaged the country, and destroyed most of what is cherished as national values and heritage. Social vices have retarded economic growth and slow down economic efficiency and development, irrespective of the abundant resources bestowed upon the country.

Corruption in Nigeria wears many kinds of unattractive and dirty clothes. The Problem of corruption has made so



many people feel much pain as the money which would have been used to reduce poverty in the country is being channelled into the pockets of some selected individuals (Abubakar, 2019). In the fight against social vices, the government of President Olusegun Aremu Obasanjo saw the need. It inaugurated the Economic and Financial Crime Commission (EFCC) and ICPC to wage war against these augury menaces. Corruption is deeply rooted among Nigerian citizens to the point that government functionaries do not perform their functions legitimately. Rather believe in bribing for files and other essential services to be effectively carried out (Abubakar, 2019). Based on the position of Abubakar (2019) regarding anti-corruption agencies and their roles in tackling Corruption in Nigeria, the commissioning of the EFCC is a laudable initiative by the former President, Olusegun Obasanjo. The effort is a major step in eradicating corruption from the country's political system. As such, the anti-graft agencies can do more to fight corruption in Nigeria.

Abubakar (2019) asserted that Nigeria's image as the giant of Africa had suffered many setbacks due to anti-social and criminal acts, such as high corruption, terrorism and other criminal acts. Regrettably, the system of education is getting worse daily; the education that is supposed to be used to correct the wrongdoings in society and as an agent of transformation, empowerment and a tool of clearing the minds of young ones to become useful members of the society is a sideline and not properly funded by the government. It is important to evaluate the value system of Nigerian society and the prevailing social situation, particularly

regarding the transformation and development in Nigeria. In all aspects of human endeavour, value dictates the choices man makes. Therefore, evaluation and orientation through the education system are important, especially as values affect human behaviour, conduct, and actions. This can be inculcated into the youths through education.

Different people see value as a pivot of human behaviour in different ways. The different opinions concerning what values are and what should be valued depends on various individuals/society. To an average citizen, values are those basic beliefs that society cherish, such as attitude, honesty, morals, integrity etc. Transformation entails the general change in the appearance or character of a society in terms of restructuring; from culture to social relations; from politics to economy; from the way we think to the way we live. This transformation can be achievable through societal values, including; value orientation, moral values, and attitudes; all these are expected to transform the society, though other anti-social vices could hinder social transformation in Nigeria, such as corruption, crime, electoral violence, financial misappropriation, examination malpractice, cultism, drug abuse among others.

According to Dams (2009), development is a process rather than an outcome; it is dynamic in that it involves a change from one state or condition to another. It brings about social change that allows people to achieve their human potential. Society will work well when the sectors carry out their functions as expected, just like ICPC and EFCC are doing a good job tackling financial crime.

## Theoretical framework

Functional Theory of Social Change: The functionalist theory teaches that society is like a human body. Each part is like an organ. Individual parts can't survive on their own. Emile (1956), a major leader in the social sciences, believed that all parts of a society must be harmonious. If they aren't unified, society is "no more than a pile of sand" vulnerable to collapse. When one part suffers, all the other parts must adjust. Why? The functionalist theory believes that society always works toward stabilisation. Problems are temporary but need attention from the other parts when problems occur. This means social change.

Society is seen as an organised network of cooperating groups that operate fairly orderly according to rules or values shared by most members. This theory aims to balance the operating system by allowing functional and sustainable development in society, especially when all institutions fulfil certain functions continually for the good well-being and function of the society.

Political leadership is functional because of the value system that every society operates at one time or place to remain functional and dysfunctional. Therefore, change in political ideology and manifestos aimed at shortchanging the political will are non-functional. At the same time, acts of corruption, bombing, nepotism, terrorism, kidnapping, and assassination, among others, are dysfunctional.

## Value System

Value connotes importance, something that is qualitatively cherished: something that provides satisfaction or sense of accomplishment". Moral value is a matter of conscience. The conscience makes an individual consider the effects of what she is planning to do on other people. In other words, conscience makes you think yourself into the position of other people affected by what you are doing and, further, to think whether they would likely agree with what you are doing (Okoh, 2003). Conscience differs from one person to the other. While some people's conscience is sound and functional, others have a dead conscience when things are not done right. Moral values, therefore, operate in our conscience. This inevitably affects our value system.

The value situation in Nigeria is subjective and relative. It creates a situation in which everyone acts according to their conviction, often without reference to any active natural and universal principles. This calls for total moral and ethical orientation. Objectivity in Nigeria is dead.

The moral condition in all aspects of the nation's life is dominated by indiscipline, lack of respect for law and order, greed, cheating, stealing, fraud and corruption, including electoral malpractice. There is no surprise because Transparency International Continues to rate Nigeria high in terms of corruption in the countries of the world (Osaat & Omordu, 2011). Hope is not lost, as part of the values associated with Nigerians is religious values, among others.

Okoh (2003) identifies the following types of values: Religious Values,

Moral Values, Aesthetic Values, Social Values, Cultural Values, Intellectual Values, and Economic Values. Religious Values mainly deal with salvation, God, beliefs, the next world, sin, failure and success, etc. At the same time, moral values are honesty, liberty, justice, brotherhood, neighbourliness, etc. These values guide man's conduct towards his fellow man.

### **Value Orientation**

Value orientation means the principles of right or wrong that individuals or social groups accept (Word Net, 2012). It also means the change of the moral character for the better through the renewal of the innermost nature. Value orientation can also be seen as high moral intelligence and entrenchment of strong values for the development and prosperity of an organisation. It is a transformation of a fundamental shift in the deep orientation of a person, an organisation, or a society. The world is seen in new ways, new actions and results that become possible that were impossible before the transformation (Asobie, 2012).

Njoku (2011) sees value reorientation as inculcating good values that can help Nigeria out of her numerous predicaments and refocus the nation through greatness.

### **Needs for Value orientation and Social Transformation in Nigeria**

In Africa, the larger the country, the more complicated problems in terms of governance. One of the difficult things that affect Nigeria today is restoring our national values and integrity, especially when past governments have formed a negative attitude.

The decline and fall of Nigerians in behaviour is a well-known fact worldwide (Denen, 2020). Reading through the highlights of newspapers and magazines and watching television, one reads and sees stories of the many crimes that Nigerians indulge in. Fraudulent practices in Nigeria are too numerous, so much so that people need guidance on what to do.

This decline is rooted in the family and school set-up, where many parents and teachers must bring up children right. Once the right upbringing is not received at the initial stages of a child's development, many things will go wrong later in life.

So many things have gone wrong. There is a need to place a premium on a sound educational base targeted at societal transformation, such as honesty and good moral behaviour. Education is a crucial sector in any nation, especially as a major investment in human capital development. Education is critical in long-term productivity and growth at both micro and macro levels.

In agreement, Fafunwa (1974) sees education as 'what each generation gives to its younger ones who develop their attitudes, abilities, skills and other behaviours which are the positive values to the society in which they live. Education brings about good values which produce sound and good citizens, such as honesty, selflessness, tolerance, dedication, hard work, and personal integrity, all of which provide a good foundation for veritable leadership. The NPE (2004) also specifies value systems as acceptable in the country. This can be taught to the learners through the quality of educational instructions. In all of this, it can be conveniently argued that only a good educational approach can

transform society. It is only individuals who have been positively transformed that can transform society.

### **Problems facing National Development in Nigeria**

According to Nweze (2004), problems of national development were alleged to have been attributed to some factors, such as corruption, unemployment, poverty, poor government policies, weak judiciary system, poor leadership, ethno-religious crises, socio-economic inequalities, among others.

Greed and Corrupt Leadership: These are major problems of our society today, especially Nigeria since her independence; Nigeria has for decades been characterised by predatory and rapacious behaviour of the elites whose attitudes have been based on parochial mindedness. The buccaneer elites are scattered throughout its political landscape. They indulge in deception and falsehood to sabotage and plunder the economy with impunity, rendering it futile. To cover up, the same elite often manufactures spectacular sceneries of an anti-corruption campaign through programs and policies and is advertised to the international community, who are scared of investing in the country due to its cost of business. Yet, they create loopholes within the system to escape and undermine anti-corruption efforts (Yamah, 2013).

Ewatan (2013) works pointed out that Nigeria officials are by nature experts in the act of double-speaking about corruption in general but yet try to maintain a clean image. It seems the entire state machinery exists only to

siphon off cash, and many government functions have been adopted mainly for personal gains. Vanda (2010) noted that seeking a political position is to get access to the state to control rents from various means, including legal, semi-illegal, or outright illegal economies. From all intent and purpose, the main aim of governance is solely to seek opportunities for rent-seeking for personal aggrandisement.

Political Conundrum: Leadership recruitment system in Nigeria has been deliberately faulty. Throughout most of its political history, positions of authority were hardly occupied by disciplined, best qualified people who deliberately seek an elective post through the ballot box (popular acclamation). For example, the military has overtaken the political scene through coup d'état and counter-coups d'état and ruled the country for over 30 years. Political appointment has been through forceful candidate imposition by self-anointed power brokers. Take for example, the 1993 presidential election supposedly won by the late MKO Abiola through popular decision at a seemingly free and fair election was annulled and denied the opportunity (Alege, Adamu & Muhammed, 2014)

Poor reward system: This another systematic problem in Nigeria is the poor reward system in our national life. Take for example, there is no encouragement or appropriate reward system for dedicated and hardworking people both at government and community levels. Equally, there is no consequence for wrongdoing, especially those from the ruling class or the rich. Remunerations in the civil service are dismally low and lately paid, so benefits and allowance are also

low or nonexistent. As a result of delays in payment of services rendered businesses yield low turnover because they depend on the workforce to patronise them. There must be rewards towards services rendered to discourage sharp practice. The inability for a public servant to send a child to a good school, have access to healthcare, and own home after 35 years of service or at the age of retirement at 65 years can only encourage such officials to develop unethical means to achieve all these (Bello, 2016).

Family pressure: Nigeria as an African country practices an extended family system. The practice could bring pressure to bear on those who are opportune to be (gainfully) employed. In Nigeria, people's attachments and loyalty are geared more towards groups, social cleavages, and relatives. Those who become successful in the public sector or in the exchange economy are expected to share their benefits with their extended families and ethnic cleavage. To meet the needs of loved ones and relatives, civil servants go the extra – mile in their official capacity to advance their interest and accumulate more funds (Onalaja, 1997).

Poor leadership: This is another challenge that causes economic instability and insecurity in Nigeria. Since the coming of third and fourth republics in 1999 and 2009 respectively, which was just barely a decade ago after the military intervention. According to Charas, Mbaya and Liberty (2014), in previous times, leaders came in with a series of culture of violence such as thuggery and other anti-social vices.

Poverty: Poverty, which is a multidimensional phenomenon, the world development report 2000/2001 (World Bank, 2001) summarises the various dimensions as a lack of opportunity, lack of empowerment and lack of security. Other opportunity remains closed to the poor masses, and this makes it practically inactive in society (Danladi, 2007).

Weak Security System: It also causes corruption and translated into economic problems in the country. Most often, judicial systems are weak and as a result, social vices like greed, disloyalty to constituted authority, disrespect to the laws of the land etc. manifest in the society.

Unemployment implies when people are not engaged in meaningful work and lacking the necessities of life. The activities resulting from unemployment have direct consequences on corruption. As a result of this, kidnapping and insecurity posed challenges to society. The cases of Boko-Haram and Niger Delta Avengers is luring the youths into crime. Many Nigerian youths have become prey to terrorists and are easily radicalised. In Niger Delta region for example, unemployed youths were the ones used as militant to frustrate the multinational oil companies in the Niger Delta (Uzochukwu, 2013). A political activist Odumakin (2012) asserted that Nigeria will have no peace with the rate of unemployed youths (Nobody is safe).

### **Impact of Social Vices on National Development**

Concerning the above author, Oyinola, (2011) sees corruption as

organised crime that destroys a nation, state, facilitates environmental degradation. Social vices are associated with erosion of talent in public institutions when it encourages employment based on nepotism, cronyism and patronage, not on merit thereby reducing the quality of public institutions. Corruption makes it impossible for government agencies to enforce contracts laws and property rights, therefore, killing the country's start-ups, small businesses, and innovations (Pellegrini and Reyer, 2014).

Dike (2015), due to the fear of the unknown social vices, has created insecurity activities across Nigeria that necessitate agitation from different parts of the country for better welfare. As a result, most commercial activities have been paralysed to attract government attention. Due to corruption, government revenue remains unachievable as most revenue generated are diverted and not remitted for public use but personal purposes. According to Bayley, (2014) and Ajide, (2015) the negative consequences of corruption are many, and among the following are:

Poor Investment: The high rate of unemployment in Nigeria is as a result of low level of investment into the Nigeria economy by foreign investor due to bad policies of government that ought to have encouraged foreign investors but the reverse is the case as companies takes their investment to other country with favourable governmental policies.

In the submission of Bayley 2014 and Ajide (2015) they both agreed that poor investment create unemployment in Nigeria, looking at their submission

critically, it will not be out of place hence the problems are still persisting, owing to the fact that the situation of insecurity in Nigeria is discouraging foreign investors from investing both capital and human resources in the country. For example, most of the capable hands are not gainfully employed due to bad policies or governance.

Poverty: When the heads of public service are busy laundering the money that is supposed to be used to create employment for the masses and reduce poverty, what happens is that there will be a rise in the country's poverty level. In recent statement released by the National Bureau of Statistics (NBS, 2022) highlight that statistically, 63% of persons living within Nigeria (133 million people) are multidimensionally poor. In line with the above statement by NBS, indicates that majority of Nigerians are poor.

Poverty as an indicator that bring about social vices in our society today as it was suggested by Bayley and Ajide (2014 and 2015) respectively that poverty is eating deep into our society today, owing to the fact that the resources meant for the public is being diverted to private purses within the government circle. For example, National Bureau of Statistics (2022) confirmed what Ajide and Bayley (2014 & 2015) argued and the poverty level is still ravaging our society today. From NBS submission in November, 17th 2022 putting Zamfara as the poorest state across Nigeria and if care is not taken social vices will continue and all hands must be on deck to put reduce the poverty level in Nigeria.

**Poor National Development:** Most countries that engaged in corrupt practices are likely to experience developmental bankruptcy. Where most Chief Executive Officers of government agencies engage fraudulent practices to make their fortune, this implies that the economic activities of such nation will suffer and dampen.

In the same submission of Ajide and Bayley (2014 & 2015) pointed out that poor national development is eroding most African countries and Nigeria where most chief executive officers of government agencies are engaging in corrupt practices and as a result endangering national development and growth. In a case of the immediate past Accountant General of the Federation who siphoned public funds to the tune of N900billion, this constitutes a great danger to national development

**National Crises:** The insecurity and crisis experienced in Nigeria today result from injustice and bad governance which bring backwardness into our national unity and stability. The insurgency perpetrated by Boko Haram sect, bandits and herdsmen/farmers clashes has seriously affected the country's economic growth.

It will be agreed that as a result of national crises which can be linked to poor governance by political gladiators in Nigeria has brought about inter-communal clashes between settlers/herdsmen and indigenes in almost every part of the country, the unknown gunmen taking lives and destroying national assets in the eastern part of Nigeria, agitations for sovereignty in the western and eastern parts of

Nigeria. This shows that every part of the country is not at peace which has negative impact on the socio-economic development of the nation, this is in line with Ajide and Bayley (2014 & 2015) respectively. To bring an end to all sorts of agitations here and there, the political gladiators, government officials at all levels must put national interest above self interest; hence national unity is paramount for development

### **Measures towards Eradicating Social Vices in Nigeria**

In this paper and in Oyinola (2011) works, it's believed that if the following measures are carefully considered, social vices will be eradicated or reduced to the barest minimum.

**Self-Satisfaction:** Self-Satisfaction in this context implies being contented with whatever one has. Meaning that Nigeria leaders and citizens should be satisfied with whatever they earn at the end of the services they render and as such it will put an end to all the negative social vices highlighted earlier in this paper, this will bring an end to the issue of embezzlement and money laundering.

**Institution of Strong Anti-Corruption Groups:** The various anti-corruption agencies created by the government is gear towards eradicating the issues of money laundry, internet fraud, and embezzlement and to check the activities of government officials where necessary and the agencies should be allowed to carry out their legitimate functions independently without any interference of the government that established them. And if anyone or any government official is involved in corrupt

practices, they should face the consequences as required by law irrespective of who is involved in such act.

**Employment Generation:** Every reasonable government should be concern about the employment of the citizens by creating more job opportunities and empowerment schemes for the unemployed to bring an end to any act of social vices in the society. When citizens are jobless and unemployed, they end up engaging in criminal activities and the country will suffer the consequences of it, if adequate attention is not paid for job creation. Hence the saying “An idle mind is the devil’s workshop”.

**Funding of Education:** Hence education is a tool for national development. Therefore, government should provide adequate funding and budgetary allocation for education in the country. When government provide enough funds and pays attention to every level of education in the country from basic to tertiary institutions, it will help produces graduates with high level of intellectual capacity and skill who will be active and able in contributing their own quota in all sectors of the economy for the development of the country.

**Equality among Citizens:** Every citizen of the country is expected to be treated equally irrespective of tribe, religion, ethnicity, political view, or social background to reduce social vices. Hence, nobody is above the law, and anyone who acts contrary, should be punished accordingly. The law should not be applicable alone to son or daughter of nobody rather should be applicable to all, irrespective of one’s class or status in the society.

## **Measures towards Transforming Society**

**Cultural factor:** For any society to be developed the culture and values of such society must be respected accordingly, as all members of the society culturally accept what is right as right and frown at whatever is wrong as wrong. With this, things are done exactly how they should be done without any interference from any section. The decline in cultural values has led to many societal problems like corruption, nepotism, tribalism loss of merit with gradually eroding the smooth operating system of the society forcing it to change. As a result of the change of morality and values system, the negative impact is on the increase.

**Technological factors:** Technology changes the environment, and this change usually affects man’s surroundings as an adjustment made to change often modifies the social institutions. Modern societies are undergoing very rapid change of development in transportation, commerce industrialisation, which has great impact, and industrialisation, which greatly impacts the nation’s economy as is the benchmark for transformation and national development.

**Institutional factor:** The component of society must as matter of urgency to work together such as the family, economic, political, religious, educational and mass media among others. Society must change its strata of operation promote the positive value that will enhance national development and discourage anti-social behavior that will hinder societal development. All sectors of our society should lay great emphasis on our values as bases of our moral life. Let



our values be instilled in our young ones to get a better result not sentiments.

### Conclusion

No society can achieve an expected target if its values are left at the mercy of select individuals, circumstance, and time. Nigerian youths are seen to be generally active and creative, there is a need for assisting them at whatever level towards engaging them meaningfully. Importantly, there is a need to re-orientate the minds of Nigerians for a total turnaround so as to bring total transformation and development. With this, Nigeria will improve how things are perceived and the environment created. Values reorientation process has to be given priority by the present government at all levels. Every Nigerian is equally expected to be part of this exercise for a better tomorrow. Therefore, the right ethics is that which is based on the common good of the society; such should be the case in Nigeria as a society. Common morality for all to protect the interests of all.

### Recommendations

For corruption to be drastically reduced, it must be viewed from the national security perspective and given the needed attention it deserves. To this end, the paper suggests introducing and strengthening preventive, punitive and cooperative measures. Below are some useful ways of tackling Corruption in Nigeria:

i. The government should establish standing frameworks for training youths to acquire practical skills that bring physical and mental development.

- ii. The federal government and Non-Governmental Organisations (NGOs) should embark upon massive youth development programs on creative skills as this may be a viable intervention for employment.
- iii. Reorientation of the youths should form part of the school curriculum to instill discipline in them. Students should be taught not to give and receive bribes no matter what, our national values must not be taken for granted for that is our backbone.
- iv. The strengthening of anti-corruption institutions and other initiatives (such as the EFCC, ICPC, Due Process, NEITI; to deepen the fight against corruption; members of the different regions should be made to be part and parcel of these bodies to ensure fairness.

Job creation should be uppermost in the government's policies and programs to address the root causes of insecurity in Nigeria.

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