

Effectiveness of Motivational Interviewing (MI) and Differentiated Instruction (DI) Teaching Modes on the Academic Performance of Public Secondary School Students in Niger State, Nigeria

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Abstract: Creative thinking skills are essential for success in learning and success in life. In Nigeria, traditional method of teaching is a teacher centered approach. What promotes creativity is a questioning classroom, where teachers and pupils value diversity. Differentiated Instruction is based upon the principle that all children learn best when the instruction is responsive to the uniqueness of each student. The problem of this study was to determine whether differentiated instruction increases student achievement and whether using motivational interviewing for pre-assessments in a differentiated classroom has effect on student achievement. Qualitative and quantitative research methods were applied. The purposive sampling method was employed in the choice of sample schools. Thirty (30) participants comprising 15 male and 15 female were randomly chosen from each school to form the experimental groups (Experimental group I, 30, Experimental group II, 30 and Control group, 25). A total of 85 SS2 students participated in the study. The research instruments for this study were: (a) the Treatment Instrument- English Language course material, (b) Test Instrument- English Language Achievement Test (ELAT) with focus on reading and spelling. The quantitative data collected were analyzed using Statistical Package for Social Scientist (SPSS) version 18. The data were analyzed using descriptive statistics (mean and standard deviation) and inferential statistics (T-test, one-way Analysis of variance). Findings of this study indicates that differentiated instruction with motivational interviewing teaching modes facilitate higher performance than the traditional teaching method. It is recommended that to increase student achievement, the focus must be on the instructional strategies occurring in the classrooms.

Key words: *Differentiated Instruction, Motivational Interviewing, and Traditional Teaching Method.*

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I. INTRODUCTION

An educator once said, “We can tell who won’t make it in high school by first grade”. Although this statement is shocking and dismal, it is true and has been happening for decades. Something is dreadfully wrong with this (Jensen, 2011).

No longer can it be decided that some students just will not make it. This cannot be something that is accomplished outside of the classroom; it needs to come from within. Do we know and understand what is happening in our classrooms? Are all students being challenged? What are we doing about it?

Creative thinking skills are essential for success in learning and success in life. Creative thinking involves a range of skills that can be promoted across the curriculum. There is potential for creative thinking in all fields of human activity, and in all lessons. Developing creative thinking in young learners is one way to develop children’s capacity for original ideas and creative achievement (Fisher, 2006). Promoting creative thinking is a powerful way of engaging children with their learning. Children who are encouraged to think creatively show increased levels of motivation and self-esteem. Developing the capacity to be creative can enrich their lives and help them to contribute to a better society (Koeze, 2007).

Creative children need creative teachers, but there are many blocks to creativity. One block may be defensive teaching. There is little chance for creativity where pupils work for long periods of time with low demand and little active input, or where outcomes are controlled and prescribed, or complex topics taught in superficial ways. Creativity thrives where there is time to explore, experiment and play with ideas. Children need the right conditions for creativity to flourish (Fisher, 2006).

In Nigeria, traditional method of teaching is a teacher centered approach. Teacher dominates the class and students are expected to learn without questioning or contributing to the lesson. In a classroom situation, students differed in terms of intellectual ideas and conceptions; they learn and understand more quickly and easily than others, there is not a classroom in this country where all students are identical and learn the same way, but these facts were not taken into consideration in traditional method of teaching (Umoh, & Akpan 2014; Gambari et al., 2017). A typical classroom narrows our thinking strategies and answer options.

What promotes creativity is a questioning classroom, where teachers and pupils value diversity, ask unusual and challenging questions; make new connections; represent ideas in different ways-visually, physically and verbally; try fresh approaches and solutions to problems; and critically evaluate new ideas and actions (Chike-Okoli, 2006).

Teachers can be highly creative in developing materials and approaches that fire children's interests and motivate their learning. Fisher (2006) stated that there are three related tasks in teaching for creativity: encouraging, identifying and fostering. Many young people do not think of themselves as creative and lack the confidence to take even the first steps. Consequently, the first task in teaching for creativity is to engage young people to believe in their creative potential, to engage their sense of possibility and to give them the confidence to try. These attitudes can be encouraged and nourished to varying extents in all young people, particularly if they are linked with the development of self-directed learning (Taryea, et al., 2014). Creativity draws from many ordinary abilities and skills rather than one special gift or talent.

Teaching for creativity aims to encourage self-confidence, independence of mind and the capacity to think for oneself. Traditional method of teaching alone may not be suitable for individual requirements thus, there is need for modern approaches to cater for difference in learning styles (Gambari et al, 2006; Chike-Okoliet al., 2018). These could include: e-learning, blended learning, motivational interviewing, differentiated instruction (DI), among others.

Differentiated Instruction is based upon the principle that all children learn best when the instruction is responsive to the uniqueness of each student (Chike-Okoli, 2018). The intent is to maximize each child's opportunities for growth and individual success, by addressing their academic abilities, learning styles and interests. In order to challenge students at their readiness levels, teachers vary approaches on what students need to learn (content), how they learn it (Process), and how they demonstrate their understanding (product) (Koeze, 2007).

The theoretical framework is based on the multiple intelligence theory and Brain Research (Kaufeldt, 1999). Writing on the elements of differentiation, Smith (2015) observed that students vary in readiness levels, interest levels and learning profiles. To differentiate in response to student readiness, a teacher constructs tasks or provides learning choices at different levels of difficulty. To differentiate in response to student interest, a teacher aligns key skills and materials for understanding from the curriculum with topics or pursuits that intrigue students. To differentiate in response to students' learning profiles, a teacher addresses learning styles, student talent, or multiple intelligence profiles (Differentiated Instruction in Action, 2018).

Differentiated Instruction helps learners to take responsibility of their learning, become autonomous and self-confident. It enables introvert students to interact more freely, provides diversification of activities, fosters their intrinsic motivation and permits the acquisition of valuable and individualized learning skills (Jensen, 2011).

Differentiated instruction involves giving students a range of ways to access curriculum, instruction, and assessment; interacting and participating in the classroom; demonstrating and expressing what they learn; and understanding and taking in information. Differentiated instruction is based on the assumptions that students differ in their learning styles, needs, strengths, and abilities, and that classroom activities should be adapted to meet these differences (Smith, 2015). Differentiation means tailoring the instruction to meet individual needs. The use of ongoing assessment and flexible grouping makes this a successful approach to instruction (Whitmore, 2013).

There are three major Differentiation strategies: (i) Tiered instruction- provides teachers with a means of assigning different tasks to students within the same lesson or unit. Assignments, activities and homework can be tiered. (ii) The RAFT strategy (Role-Audience-Formal-Topic) – gives students choice, appealing to their interests and learning profiles, and adapting to student readiness levels, forces students to process information, rather than just writing out answers to questions. Thus, students are more motivated to undertake the writing assignment because it involves them personally and allows for more creative responses to learning the materials. Using RAFTs- provides a kind of choice that has been shown to increase student engagement. (iii) The Think-Tac-Toe Strategy- is a simple way to give students alternative ways to exploring key ideas. Here it does not matter the choices students make, they must work with key ideas and use the key skills central to the topic (Smith, 2015; Whitmore summer, 2016).

Empirical evidence on effectiveness of Differentiated Instruction has not been concluded. According to Lee (2002), "since the Coleman Report in the 1960's brought attention to racial inequality in student outcomes,

the achievement gap between white and minority students has raised a multitude of concerns and resulted in a significant body of empirical research. This achievement gap is argued to have lifetime consequences limiting opportunities for minority students in higher education. This research indicated that most classrooms have taken on the role of teaching to this “on grade level” student population, leaving the learning needs of the challenged and under-challenged groups unmet (Koeze, 2007). The results of this observational study indicate that little differentiation in the instructional and curricular practices is provided to gifted and talented students in the regular classroom.

Educators who view classrooms as whole entities and do not account for the variances in the levels of readiness with which students enter the classroom may either over-challenge or under-challenge the learners. In classrooms where one lesson is designed for all learners, limits are placed on students’ achievement. Classrooms in which differentiation is taking place may help to close the achievement gap that has been prevalent for years in schools. According to Tomlinson (1999), teachers in differentiated classrooms use time flexibly, call upon a range of instructional strategies, and become partners with their students. Differentiation suggests that all learners can achieve and be appropriately challenged within any classroom.

By developing lessons appropriate to students’ readiness levels, interest, and learning profiles, teachers will be able to draw upon prior knowledge and student experiences outside of the school environment which will empower students to ask questions and their opinions because they already have knowledge or interest in the topic (Prince and Howard, 2002). With modifications made to lessons, students are challenged at appropriate levels to eliminate frustration and boredom. No practice is truly best practice unless it works for the individual learner. Chike-Okoli (2018) observed that individual differences will always exist in the classroom. Consequently, research on better ways to facilitate individual learning is ongoing. Classrooms are currently filled with students who have enormous differences in their readiness, interest, cultural backgrounds, prior knowledge, and learning profiles (Koeze, 2007).

The concept of Motivational Interviewing has made impact in the health system but its application to the education system particularly at the secondary school level is low in Nigeria (Chike-Okoli, 2018). Motivational Interviewing is a counseling intervention approach to Behavior Change. MI task is to help the participant (learner) recognize how life might be better and choose ways to make it so. MI facilitates Differentiation Instruction by helping identify students who are over or under challenged in the classroom teaching and learning situation; encouraging the students to identify their ambivalence to change from their current performance status to an anticipated higher performance (Miller & Rollnick, 2002).

In this study, Motivational Interviewing involves a combination of conventional face-to-face physical co-presence of teacher and students and classroom differentiation. MI is used as an instructional strategy comprising a differentiated classroom. According to O’Sullivan (1994), accommodating one’s learning style through complementary teaching or counseling interventions resulted in significant academic and attitude gains from children of all cultural groups. MI is collaborative in nature. Tomlinson & Allan (2000) suggested that no single approach works best with all students. Classrooms work best when students and teachers collaborate to develop multiple avenues to learning. Motivational interviewing is used in this study as a teaching method in a differentiated classroom. It is used also as a teaching technique to collect pre- assessment data.

Pre-assessment data allows the teacher to create lessons and activities that are appropriate for the students, no matter what level they are performing.

In differentiated classroom, the teacher plans and carries out varied approaches to content, process, and product in anticipation of and response to student differences in readiness, interest, and learning needs (Tomlinson, 1999).

Statement of the Problem

According to Hall (2004) and Koeze (2007) Differentiation is based upon the best practices in teaching; however, there is no empirical validation to support this method. Differentiation is recognized to be a compilation of many theories and practices. There is an acknowledged and decided gap in the literature in this area and future research is warranted. A differentiated classroom differs from a traditional classroom. In a differentiated classroom more than one way to complete a lesson exists for any given topic. Based on the results of pre-assessments, lessons are created to best match the needs of the learners. The decision on where to place a child is based on the student’s learning profile, readiness, or interests. A student’s readiness is determined through pre-assessments using motivational interviewing.

The pre-assessments (test, observation, student self-reporting) are used to identify any substandard learning, learning strengths, and interests that students may have already created. By building a lesson around a student’s strengths and interests, a feeling of self-worth is created and students perceive there is a solution that is attainable by them (Jensen, 2011). Pre-assessment is the foundation for differentiation.

Differentiation should not be examined as an instructional strategy by itself; it is a climate of learning created in a classroom by using best practices in teaching, learning and lesson design. Differentiation is the

compilation of the best practices in teaching and student learning theories and practices that support student achievement (Koeze, 2007).

The problem of this study was to determine whether differentiated instruction increases student achievement and whether using motivational interviewing for pre-assessments in a differentiated classroom has effect on student achievement. The finding of this study will be a foundation for future studies as to the effect of differentiation on achievement.

Purpose of the Study

This study will examine classroom practices that support differentiation. The purpose is to determine if differentiated instructional strategies have an effect on student achievement.

Precisely, the study aims to determine if teachers who were using differentiated instructional strategies were producing higher achievement results with their students than teachers not using differentiation strategies.

Research Questions

The following research questions were raised to guide this study:

- a. What is the difference in the performance of SS2 students exposed to Differentiated Instruction and Traditional Teaching Method?
- b. What is the difference between the performance of male and female SS2 students exposed to differentiated instruction?
- c. What is the difference between the performance of SS2 students exposed to Differentiated Instruction (DI) with Motivational Interviewing (MI) and those taught with Traditional teaching method?

II. RESEARCH HYPOTHESES

The following null hypotheses were formulated and tested at 0.05 level of significance:

HO₁: There is no significant difference in the performance of SS2 students exposed to Differentiated Instruction (DI), Motivational Interviewing (MI) and Traditional Teaching Method.

HO₂: There is no significant difference between the performance of male and female SS2 students taught with Differentiated Instruction.

III. METHODOLOGY

Research Design

Qualitative and quantitative research methods were applied in this study. The more one has multiple impact measures qualitatively understood and linked to quantitative measures, the greater the probability of understanding (Filstead, 1979). Quantitative techniques have been able to show by means of pre-and post-testing that changes occur to a set level of statistical significance. According to Rossman and Wilson (1991), a combination of qualitative and quantitative study methods allows the researcher to confirm or collaborate findings via triangulation. To allow for triangulation in this study, three types of data were collected: teacher surveys, student surveys, and researcher classroom observations and Teacher interviews.

The study was double-blind, the researcher made an assumption that classes were heterogeneous to begin with.

The study used a mixed method design. Two experimental groups I and II, and a control group. Experimental group I was exposed to differentiated instruction, experimental group II was taught using differentiated instruction with motivational interviewing, while control group was taught using traditional teaching method.

Quantitative data collection was first conducted as a means to outline broad relationships from the data. Results from the quantitative findings guided the researcher on how to structure the qualitative design.

Sample and Sampling Technique

The population for this study comprised of all the Senior Secondary SS2 students in Nigeria. The target population was the SS2 students from two Public secondary schools in Minna, Niger state, Nigeria.

The purposive sampling method was employed in the choice of sample schools. Thirty (30) participants comprising 15 male and 15 female were randomly chosen from each school to form the experimental groups (Experimental group I, 30, Experimental group II, 30 and Control group, 25). A total of 85 SS2 students participated in the study.

Table 1. Distribution of Sample for the study

Sample	Male	Female	Total
Experimental group I (Differentiated Instruction)	15	15	30
Experimental group II (Differentiated Instruction + Motivational Interviewing)	15	15	30
Control group (Traditional Teaching Method)	17	8	25
	47	38	85

The SS2 students were taught content in English Language (reading & writing). English Language assessment was given as pretest to all participants (pre-assessment). The pretest assessment was used in comparison to determine differences of achievement between classroom and students.

The researcher had done a prior training on differential instruction and motivational interviewing for teachers in one of the sample schools (School A). School B had no staff training on neither Differentiated Instruction (DI) nor Motivational Interviewing (MI).

Six (6) volunteer research assistants (teachers) participated in the study. All teacher assistants were given the option of at least four (4) periods (8hrs) teaching using differentiated instructional strategies within 12 weeks. Teacher participants were responsible for the instruction of every content area. The differentiated instructional strategies (independent variables) consist pre-assessment, differentiation by readiness, differentiation by interest, and differentiation by learning profile. The achievement scores of participants were the dependent variables.

Research Instruments

The research instruments for this study were: (a) the Treatment Instrument- English Language course material, (b) Test Instrument- English Language Achievement Test (ELAT) with focus on reading and spelling.

The course contents were prepared by the researcher and the research assistants using recognized textbooks, and other resource materials. The ELAT was administered to the experimental and control groups as pre-test and post-test respectively.

Validity and Reliability of Instruments

The course material was validated by four English Language teachers who are experts in the profession. Suggestions and comments from the experts and pilot students were used in the final draft.

In this study, data were triangulated as a means to validate research findings. Triangulation is used to support research findings through independent measures that point to the same conclusions. Construct validity was established by the triangulation of multiple data sources. The validity and reliability of the test was determined at Cronbach Alpha coefficient 0.84.

Data Analysis

A correlation analysis for each independent variable to determine if the number of occurrences of differentiation had an effect on student achievement.

The data were analyzed based on the stated research questions and hypotheses, using mean, standard deviation and Analysis of Covariance.

The quantitative data collected were analyzed using Statistical Package for Social Scientist (SPSS) version 18. The data were analyzed using descriptive statistics (mean and standard deviation) and inferential statistics (T-test, one-way Analysis of variance).

IV. RESULT

Research Question One

In answering research question one, mean scores of the participants in experimental I and control groups were analyzed using mean and standard deviation as shown in table I.

Table 2: Mean and Standard Deviation of pretest and posttest scores of experimental group I and control group

Group	N	Pretest	Posttest	Mean Gain
		Mean	Mean	
Experimental Group I	30	11.67	17.60	5.93
Control Group	25	9.12	14.68	5.56

From the table, the experimental group 1 exposed to differentiated instruction without motivational interviewing had a mean gain of 5.93 while traditional method control group had 5.56. In other words,

participants scored higher when exposed to differentiated instruction than when taught with traditional (no differentiation) teaching method.

Research Question Two

In answering research question two, mean scores of the students in experimental and control groups were analyzed using mean and standard deviation as shown in table 3.

Table 3: Mean of pretest and posttest scores of experimental and control groups

Groups	N	Pretest mean	Posttest mean	Mean gain score
Motivational Interviewing and Differentiated Instruction	30	12.77	18.73	5.96
Differentiated Instruction	30	11.67	17.60	5.93
Traditional Teaching Method	25	9.12	14.68	5.56

Table 3 shows that there was better performance on the post-test scores of the three groups but the motivational interviewing and differential instruction experimental group had a higher mean gain score than the other groups. From table 3 above, the motivational interviewing and differentiated instruction Experimental group 1 had a gain score of 5.96, followed by differentiated instruction experimental group II with a mean gain score of 5.93 and Traditional Teaching Method Control group had a mean gain score of 5.56.

Research Question Three

In answering research question three, mean scores of the male and female students in experimental group I & II were analyzed using mean and standard deviation as shown in table 4.

Table 4: The Mean and Standard deviation of pretest, posttest and achievement scores of male and female experimental group

Group	N	Pretest		Posttest		Mean Gain
		Mean	SD	Mean	SD	
Male	30	60.53	21.51	59.77	22.41	0.76
Female	30	61.59	22.88	61.14	23.61	-0.45

Table 4 shows the mean and standard deviation of the posttest scores of male and female in experimental group. The mean score of the pretest and the posttest scores of the male are 60.53 and 59.77, the mean and standard deviation of pretest and posttest score of the female are 61.59 and 61.14. The mean gain is 0.76 higher than the mean gain of female which is mean loss -0.45. Thus, result shows the difference of 1.37 (61.14-59.77) between the posttest score of male and female in favor of the female.

Hypothesis one: There is no significant difference in the performance of SS2 students taught using differentiated instruction, motivational interviewing and traditional teaching method.

To determine whether there was a significant difference in the posttest mean scores of DI, MI and Traditional teaching method, data were analyzed using the analysis of covariance (ANCOVA). Table 5 shows the result of the analysis.

Table 5: ANCOVA posttest on DI, MI and Traditional teaching method groups

Source of variation	Type III sum of squares	df	Mean square	F	p-value
Corrected model	365.237	3	121.735	40.243	0.000
Intercept	505.586	1	505.586	167.136	0.000
Covariance (pretest)	130.551	1	130.551	43.157	0.000
Main effect (treatment)	51.488	2	25.744	8.510	0.000
Error	245.065	81	3.025		
Total	25585.000	85			
Corrected total	610.305	84			

Significant at 0.05 Alpha level

Table 5 shows there was a significant main effect of Differentiated Instruction and Motivational Interviewing on student's performance, $F(1, 81)=10.732$, $p < 0.05$. This indicates that there was significant

difference in the performance of experimental group taught with differentiated instruction, differentiated instruction and motivational interviewing and traditional method control group taught English Language content. Hence, hypothesis one was rejected.

Hypothesis 2: There is no significant difference in the performance of male and female SS2 students taught with Differentiated instruction.

To determine whether there was significant difference between male and female using Differentiated instruction, data were analyzed using the analysis of covariance (ANCOVA). Table 6 shows the result of the analysis

Table 6: ANCOVA Result of Male and Female students in the Experimental Group I exposed to Differentiated Instruction

Source of variation	Type III sum of squares	df	Mean square	F	p-value
Corrected model	13.781	2	6.898	1.455	4.303
Intercept	3372.030	1	3384.030	713.779	12.706
Covariance (pretest)	2.881	1	2.881	0.608	12.706
Main effect (treatment)	13.773	1	13.773	2.905	12.706
Error	128.073	27	4.741		2.052
Total	207133.00	30			
Corrected total	141.875	28			

Table 5 shows that the main effect of treatment of experimental group Differentiated Instruction on gender produced an $F(1,27)=4.21, p=2.05$. This result was not significant at 0.05 alpha level. The hypothesis 2 was therefore not rejected. This implies that female student's achievement scores did not differ significantly from that of their male counterparts when both were exposed to differentiated instruction.

V. FINDINGS AND DISCUSSION

In the classroom, a formal pre-assessment was a choice for students, in other classroom pre-assessment was mandatory in the area of spelling. The teacher assistants used several methods for pre-assessing their students to determine readiness. The students' selection of choices remained consistent. The students were excited and this raised their motivation in the classroom.

The finding is consistent with the findings of McTighe & Brown (2005) that attending to the learning environment builds a context for learning.

Informal pre-assessment methods (classroom observations, informal questioning) proved to be powerful tools to the differentiated classroom. Motivational interviewing was also applied as informal pre-assessment method to allow the teachers to constantly re-assess where their students were academically and to adjust the instruction accordingly.

Currently, in traditional classrooms, teachers teach and move on and spend a large portion of their time re-teaching those students who didn't get the skill the first time. Unfortunately for those students, the re-teaching is delivered in the same manner and the student still doesn't get it (Jensen, 1998; Koeze, 2007). Motivational interviewing and differentiated instruction provide the instruction adjustment period to cater for difference in learning. Informal pre-assessments helped the teachers to uncover unique interests of their students and find what really excites them about learning. When teachers understand where students come from in regard to their backgrounds, they are better prepared to set the stage for learning.

Having students select an activity based on their interests and learning strengths gave them greater motivation to demonstrate their knowledge, choosing an assignment based on their learning style strength because that is the most interesting and creative way for them to work.

VI. Conclusion

Findings of this study indicates that differentiated instruction with motivational interviewing teaching modes facilitate higher performance than the traditional teaching method. Quantitative survey results revealed several differentiated independent variables such as choice and interest that were found to be consistent in the differentiated classrooms, as reported by both the teachers and the students. Evidence of these same variables in practice was looked for during classroom observations. When teachers are allowed time to collaborate and discuss what works best with students, not only will it result in better implementation of these strategies at the classroom level but also throughout the school, new meanings of understanding best practices can be cultivated in a school.

VII. RECOMMENDATION

Informal pre-assessment methods worked well in differentiated classrooms. Informal pre-assessment often changed the direction the teaching was heading. It is recommended that teachers need to understand this is an accepted method of lesson planning, and although it may seem more time-consuming, informal pre-assessment will save re-teaching after the lesson unit is completed.

In Traditional classrooms students are grouped inappropriately. When teachers understand what interest their students, lessons can be created that foster high interest and increase student motivation. Pre-assessments which is set-induction to determine prior knowledge and experience of student must be the beginning of any lesson unit. According to Dunn et al, (1995) instructional strategies designed to meet the needs of students resulted in a statistically significant difference in achievement by those students over those students not being accommodated. In order to increase student achievement, the focus must be on the instructional strategies occurring in the classrooms.

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