ASSESSMENT OF TEACHERS' CREATIVE THINKING, DISPOSITION AND COMMITMENT ON STUDENTS' ACHIEVEMENT IN MATHEMATICS IN ABEOKUTA NORTH LOCAL GOVERNMENT AREA OF OGUN STATE

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Abstract
The future of any nation depends on the quality of its educational system which in turn depends on the effectiveness and quality of the teachers. This study assesses teachers' creative thinking, disposition and commitment on students' achievement in mathematics in Abeokuta North of Ogun State. The study adopted survey research design type. The population for this study comprises all SSSII Mathematics teachers and students in both Public Secondary Schools and Private Secondary Schools. A Multi stage sampling technique was used to select 32 mathematics teachers and 200 students to participate in the study. Four validated instruments were used for this study. The data collected was analyzed using Analysis of Variance (ANOVA) and Multiple Regression. The result shows that significant difference was found between creative thinking and teachers' experience ($F_{(4, 195)} = 3.089$, $P< 0.05$). Also, findings reveals that there is significant difference in teachers' commitment based of year of teaching experience and students' achievement in mathematics ($F_{(4, 195)} = 3.751$, $P< 0.05$. The findings further show that teachers' creative thinking, disposition, and commitment statistically and significantly predict students' achievement in mathematics ($F_{(3, 196)} = 34.957$, $P< .050$.) Based on the findings, it is recommended that mathematics teachers should improve on their creative thinking and commitment through positive disposition to enhance students' performance in mathematics at all levels.

Keywords: *Teacher Creative Thinking, Disposition, commitment, Achievement in Mathematics.*

Introduction

Education is considered as a strong weapon of change, bedrock of natural development, and an instrument for social reconstruction as a result the future of any nation depends on the quality of its educational system and teachers. The subject 'Mathematics' is the numerical and calculation part of man's life and knowledge. It helps man to give exact interpretation to his ideas and conclusions. It deals with quantitative facts and relationships as well as with problems involving space and form. It also deals with relationship between magnitudes. Virtually most activities in life entail simple calculations addition and subtraction though these calculations are more of abstract thinking than concrete. Every individual that thinks about the future engages in one mathematical activity or the other (Onakoya, 2014).

Research findings are indicates that teachers who have a good background in mathematics also add richness to their lessons, involve students' extensively in mathematical dialogue and capitalize on student's questions/discussions to weave/ extend mathematical relationships (Karataş & Başbay, 2014; Ülger, 2016). Over the past decade, occupations that rely on people skills and emotional intelligence gained tremendously from a creativity of employees. This was also witnessed in jobs that required imagination and creativity. Several researchers view

creativity as vital, especially at the present when current jobs performance is transforming rapidly with the advance of information technology that complements globalization for economic advancement.

Creative thinking can increase teachers' capability to learn and teach in a way that ignites interest in the classroom. Rapid changes taking place in the world today coincide with the definition of creativity given by Yenice (2011), in which case the author states that creativity is breaking away from old styles, and it is skills that bring something new and valuable to the people to do new things.

Teacher Creativity is viewed as a resource for economic development (Florida, 2002) and a means for social regeneration (Banaji, Burn, & Buckingham, 2006). This strategic framework for European cooperation in Education and Training emphasizes the need to address the enhancement of creativity and innovation, including entrepreneurship, at all levels of education and training. According to Moore (2013), creative thinking is one of the most important keys of the 21st century higher order thinking abilities and sparkle for innovation, which is in turn acknowledged as one of the key drivers of sustainable economic development (Moore, 2013).

According to Darling-Hammond (1997), the quality of teaching is the key to boost the success of students in learning and proficiency. Many efforts have been taken to provide a better quality of teaching throughout the professional development. Teachers' creativity thinking can help students to increase their level of thinking and teachers' communication with students. Teachers' disposition or commitment towards work is very important to encourage the students to learn. Teachers' commitment towards work becomes visible in promoting and maintaining the teachers' positive behaviours. Teachers who teach effectively can give students fitting and helpful feedback. According to Kreitner and Kinicki (2007), commitment is an important work disposition because it drives the individuals who are expected to be willing to work harder to achieve their goal and remain employed.

Teachers have to developed appropriate dispositions to promote learning for all students especially in subject like mathematics. Teacher dispositions include the necessary values, commitments, and professional ethics that influence teacher behaviours. Dispositions are guided by beliefs and attitudes related to values such as caring, fairness, honesty, responsibility, and social justice. Dispositions are affective, thus in the mind of teachers (Wayda & Lund, 2005). But dispositions show up in teacher behaviours.

The degree of teachers' commitment is one of the important strategies of enhancing academic performance of students and quality of school. Commitment is defined as a degree of positivity, affective bond between the teacher and the school. Teacher's commitment reflects the degree of internal motivation, enthusiasm, job satisfaction, efficacy and effectiveness. The improvements in the commitment of teachers are one of the outcomes that are likely to be positively affected by the new teacher reform efforts. Researchers argued that increasing the commitment of teachers is an important step in the process of school reform. Moreover, professionalization of teachers will result in higher commitment, which will positively affect teachers' performance and students' proficiency that will ultimately lead to improvements in student learning (Darling-Hammond 1984; Darling-Hammond 1997).

There is a widespread consensus from stakeholders on the relevance of the teacher for fostering or hindering learners' (and therefore students) creative potential (Stewart & Davis, 2009; Notar, Riley & Taylor, 2009). Understanding teachers' perception of creativity and their current teaching practices is thus essential for any development of policy lines on creativity and

innovation for education in Nigeria. As a result, one cannot assert concerning the impact of these traits (Teachers' Creative thinking, Disposition and commitment) on academic achievement in Nigeria with sufficient certainty. Consequently, this question and the debate on the desirability of teaching these skills as a strategy for improving students' academic achievement remain unresolved scientifically. In the light of the above, this study sought to investigate the influence of teachers' creative thinking; disposition and commitment on students' achievement in Mathematics using some selected Secondary Schools Abeokuta North of Ogun State.

Research Questions

1. Is there any significant influence of teachers' creative thinking on students' achievement in Mathematics based on years in service?
2. Is there any significant influence of teachers' disposition on students' achievement in Mathematics based on years in service?
3. Is there any significant influence of teachers' commitment on students' achievement in Mathematics based on years in service?
4. Is there any significant interaction influence of teachers' years in service, teachers' creative thinking, disposition and commitment on students' achievement in Mathematics?

Methodology

The study adopted descriptive survey research design type. The population for this study comprises all Senior Secondary School Mathematics teachers in both Public Secondary Schools and Private Secondary Schools in Abeokuta North of Ogun State. Multi stage sampling procedure was adopted in the study. First, eight (8) schools were randomly selected. From each of these schools, four mathematics teachers were randomly selected to participate. For the assessment of teachers in terms of their job performances, twenty-five (25) students were randomly drawn using systematic random sampling technique from each sample schools to assess students' achievement in mathematics. In all the total number of respondents involved in the study were 200 students and 32 teachers. Four validated instruments were used for this study. These are; Teachers' Creativity Questionnaire (TCQ), Teachers' Teaching Disposition Scale (TTDS), Teachers' Commitment Scale (TCS) and Mathematics Achievement Test (MAT).The instrument were developed by the researchers and used to collect information required for the study. The reliability; content and construct validity of the instrument was established using Ordinal Alpha reliability coefficient and Kuder-Richardson 21(KR_{21}) for the mathematics achievement test. The reliability coefficient of 0.81, 0.75, 0.79 and 0.68 respectively was obtained for the instruments reliability. The instrument was personally administered on the teachers by the researchers in the selected schools. The data collected was analyzed using Multiple Regression and Analysis of variance (ANOVA).

Results and Discussion

Research Question One: Is there any significant influence of teachers' creative thinking on students' achievement in Mathematics based on years in service?

Table 1: Analysis of Variance (ANOVA) of teachers' creative thinking on students' achievement in Mathematics based on years in service

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	123.510	4	30.877	3.089	.002
Within Groups	1948.570	195	9.993		
Total	1972.080	199			

Table 1 shows the summary of Analysis of Variance (ANOVA) of teachers' creative thinking on students' achievement in Mathematics based on years in service. The result reveals that significant difference was found between creative thinking and teachers' experience ($F_{(4,\ 195)}$ = 3.089, P< 0.05). This implies that mathematics teacher years of experience significantly influence their creative thinking in order to enhance students' achievement in mathematics.

Research Question Two: Is there any significant influence of teachers' disposition on students' achievement in Mathematics based on years in service?

Table 2: Analysis of Variance (ANOVA) of teachers' disposition on students' achievement in Mathematics based on years in service

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	155.741	4	38.935	0.918	. 810
Within Groups	8253.439	195	42.425		
Total	9409.180	199			

Table 2 shows the summary of Analysis of Variance (ANOVA) of teachers' disposition on students' achievement in Mathematics based on years in service. The result from the table shows that, there is no significant difference between teachers' disposition and experience ($F_{(4,195)}$ = .918, P =0.810, P< 0.05). This implies that teachers' experience does not determine their level of disposition and students' achievement in mathematics.

Research Question Three: Is there any significant influence of teachers' commitment on students' achievement in Mathematics based on years in service?

Table 3: Analysis of Variance (ANOVA) of teachers' commitment on students' achievement in Mathematics based on years in service

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	84.510	4	21.128		
Within Groups	1098.570	195	5.633	3.751	.000
Total	1092.080	199			

Table 3 shows the summary of Analysis of Variance (ANOVA) teachers' commitment on students' achievement in Mathematics based on years in service. The result reveals that there is significant difference in teachers' commitment based of year of teaching experience and students' achievement in mathematics ($F_{(4,\ 195)}$ = 3.751, P< 0.05. The general overview from the results shows that year of teaching experience is major determinant of teachers' commitment and students' achievement in mathematics.

Research Question Four: Is there any significant interaction influence of teachers' years in service, teachers' creative thinking, disposition and commitment on students' achievement in Mathematics?

Table 4: Composite Effect of Predictor Variables on Achievement in Mathematics

Multiple R = .590, R Square = .349, Adjusted R Square = .345, Standard Error = 2.774					
Analysis of Variance					
Source of Variance	**SS**	**Df**	**MS**	**F**	**Sig.**
Regression	3564.701	3	1188.233	34.957	.000[b]
Residual	6662.298	196	33.991		
Total	10226.999	199			

Predictors: Teachers' Creative Thinking, Disposition, Commitment, Criterion variable. Achievement in mathematics.

Table 4 also shows the Model Summary of the regression analysis in relation to achievement in mathematics as the criterion variable. The "R" column represents the value of *R*, the Multiple Correlation Coefficient. *R* is considered to be one measure of the quality of the prediction of the dependent variable; in this case, students' achievement in mathematics. A value of 0.590, from this research study indicates a good level of prediction while the R^2which estimated the variance accounted for by predictor variables was .345. From the model it can be deduce that about 34.5% of the total variance in mathematics achievement was accounted for by the predictor variables leaving the 65.5% to chance and residual.

The table further shows that the predictor variables (i.e. Teachers' Creative Thinking, Disposition, and Commitment) statistically and significantly predict the criterion variable (Students achievement in mathematics).From result; all the three specified models; [Model – 1: F (3, 196) = 34.957, p< .05]; shows that the regression models are good fits of the data. This means that the relationship is linear and therefore all the three specified models significant interaction influence predict the students' achievement in mathematics.

Discussion

The study investigated into the assessment of teachers' creativity thinking, disposition and commitment on students' performance in mathematics in Abeokuta North of Ogun State. The result shows that significant difference was found between creative thinking and teachers' experience ($F_{(4, 195)}$ = 3.089, P< 0.05). In the same vein findings reveals that there is significant difference in teachers' commitment based of year of teaching experience and students' achievement in mathematics ($F_{(4, 195)}$ = 3.751, P< 0.05. Meanwhile, Also, there is no significant difference between teachers' disposition and experience ($F_{(4,195)}$ = .918, P =0.810, P< 0.05). Accordingly, it is possible to say that young teachers have a more humanistic perspective towards their students. In support of this finding, Oğuz et al. (2014) reported that teachers with less than 10 years of teaching had a stronger belief in existentialist educational philosophies compared to longer serving teachers. Therefore, teachers having high creativity thinking's skills are also guaranteed to have high commitment and disposition which invariably influence their students' academic achievements in mathematics. The findings are consistent with the results of Alkın-Şahin, Tunca & Ulubey (2013) and Tümkaya (2011), for example, found that experienced

teachers are significantly higher than the less experienced teacher on the creative thinking and commitment to teaching profession. However, Bakır (2015) and Tümkaya (2011) have different results in their research as regard the creative thinking of new teachers.

The finding also, shows that the predictor variables (i.e. teachers' creative Thinking, disposition, and commitment) statistically and significantly predict the criterion variable (Students achievement in mathematics). From result; all the three specified models; (F (3, 196) = 34.957, P< .050. This finding collaborated with Oluwatelure and Oloruntegbe (2010) the tendency to think creatively in a scientific attitude can guarantee high academic achievements. In their studies, critical thinking dispositions of teacher candidates differ according to working experience (Alkın-Şahin, Tunca & Ulubey, 2013). Teaching mathematics creatively is effective in developing students' positive attitude towards the subject. It has in fact been confirmed that effective teaching strategies can create positive attitude on the students towards school subjects (Akinsola, & Olowojaiye, 2018). Quality and competent teachers can find it easy to promote students interest in the subject which has been established to be related to students' academic performance.

Conclusion and Recommendations

Teachers' creative thinking, disposition and commitment towards teaching is an essential component of 21st century strategies to enhance students' academic performance in. The purpose of the present study was to assess the teachers' creative thinking, disposition and commitment on students' performance in mathematics in Abeokuta North of Ogun State. Findings from the study showed that teachers' creative thinking, disposition, and commitment statistically and significantly influence students' achievement in mathematics. Also, teachers' experience determined their level of creative thinking, commitment and students' achievement in mathematics. Based on the findings of this study, it was recommended that teachers should place more attention on the creative thinking and their commitment, because the contribution of variables are significant to effectively improve quality of teaching- learning towards attainment of high students' academic achievement in mathematics. Teacher professional development programme should aim at enhancing teacher creative thinking and commitment to teaching profession. Mathematics teachers should be encouraged to be committed and developed positive disposition towards teaching as a profession.

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