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Mathematics Teachers' Use of Ethnomathematics Approach in Mathematics Teaching in Edo State

Lucky Aiwuyor Aikpitanyi[1] Lucy Eraikhuemen[2*]
1.Akenzua Ii Secondary Schooli.C.E Road, Benin City, Nigeria
2.Department Of Educational Psychology and Curriculum Studies, Faculty Of Education University Of Benin, Benin City

Abstract
The study investigated mathematics teachers' use of ethnomathematics approach to teaching. Descriptive survey research was used with a target population of all mathematics teacher in all public secondary schools in Oredo, Egor and Ikpoba- Okha local government areas of Edo State out of which 121 mathematics teachers in 42 randomly selected public secondary schools were sampled. Fourteen schools each were selected from the three local government Areas by balloting. The instrument for the data collection was ethnomathematics opinion survey questionnaire. Data collected were analysis using descriptive statistics. From the analysis, it was established hat majority of mathematics teachers are using ethnomathematics approach in teaching. Results also showed that there is no significant difference between male mathematics teachers and their female counterparts in their use of ethnomathematics approach to teaching and there is no signifycant difference between mathematics teachers in rural areas and their counterparts in urban areas in their use of ethnomathematics approach to teaching. Recommendation were made. One of which was the national policy on education recommendation of teacher's students ratio of 1:40 should be strictly adhered to:

1. INTRODUCTION

Mathematics is widely regarded as one of the most important subjects in the school curriculum. Indeed, it is likely that more lessons of mathematics are taught in schools and colleges throughout the country than any other subject. Great concern has been expressed about attainment in mathematics so much that every child is expected to demonstrate a high level of competence in the subject. The importance of mathematics is further emphasized when the future career of a child is being considered, with parents almost unanimously wanting their children to succeed in in the subject, largely in the hope that job prospects will be improved. What is more, mathematics is used as a filter possibly more often than any other subject, in that an examination pass at an appropriate level demanded before entry to a particular profession or occupation can even be considered.

Eraikhuemen (2003) sees mathematics as "indispensible because it has substantial use in all other human activities. It provides simple knowledge and skills needed by an individual in dealing with the problems of everyday life" (P99-100).

Mathematics is the backbone of all scientific technological investigations and all activities of human developments. It s the only language and culture common to all studies (Harbor - Peters 2000; Uzo). According to Soyemi (2003), everybody solve and use mathematics in one way or the other E.g. The driver on the steering, the cook in the kitchen, the trader in the market and the farmer in his farm, indeed, the importance and the usefullness of mathematics in the national building and everyday living cannot be overemphasizes our country Nigeria realizing this fact, made mathematics one of the core subjects in primary and secondary schools curriculum. Kurumeh (2009) (P35)

Be that as it may, the achievement of students in mathematics over the years has little or nothing to write home about. Badmus (2002), pointed out that the factors responsible for the poor performance of students in mathematics are poor teaching methods and non –usage of instructional materials by the teachers. Habor – Peters (2001), identified mode of task presentation as one of the factors that influence effective learning of mathematics.

Nevertheless, available literature has shown a variety of effective instructional strategy that can maximize students performance in mathematics. Ethnomathematics approach have been proved by researchers as one of the effective instructional strategies. Kurumeh (2009), in her study found out that ethnomathematics approach enhances understanding and efficient learning resulting in higher achievement of students in mathematics. Also, Mogari (2002) found the use of ethnomathematics approach to be efficacious. The secrete behind japanse's and chinese's success in mathematics, science and technology today is traceable to their use of ethnomathematics approach (Tereziaha, 1999, Obodo, 2000; Kurumeh, 2004; Uloko and Imoko 2007). In this study, the use of ethnomathematics approach by mathematics teachers will be examined. D' Ambrosio (2001), conceived ethnomathematics as an approach of teaching and learning mathematics which builds on the student's previous knowledge, background, the role is environment plays in terms of content and method and past and present experiences of his immediate environment. According to Harbor – Peters (2001), ethnomathematics is the cultural utility of mathematics as a science. Nigeria is a multicultural society and each student is a product of

a particular cultural group. Thus, it is believed that if we examine how mathematics arises and its uses in different cultures, we may gain a better and deeper understanding of mathematics, thereby bringing about an improvement in the teaching of mathematics as well as improvement in the performance of students in mathematics.

2. STATEMENT OF THE PROBLEM

Ethnomathematics approach promotes the rights of all people, no matter their sexual orientation, gender, ethnicity, race and socio economic status. It does this in order to allow learners to understand issues and problems of diverse society. Ethnomathematics deals with both content and the process of curriculum, classroom, teacher expectations, professional development and relationship among teachers, administrators, students and community. This approach allows students to make connections with historical developments of mathematics and the contributions made by diverse groups and individuals.

The contact of students with diverse ways of thinking and doing mathematics will raise interest in learning required content by having students apply mathematical concepts to future professional concepts and by facilitating student's performance. It is therefore necessary to ask are mathematics teachers using this instructional strategy? Does gender and location of mathematics teachers has any influence on their use of ethnomathematics approach?

3. PURPOSE OF THE STUDY

The purpose of this study is to investigate whether mathematics teachers are using ethnomathematics approach in teaching. Also investigated is the influence of gender and location of teachers on their use of ethnomathematics approach in teaching.

4. RESEARCH QUESTIONS

1. What proportion of mathematics teachers are using ethnomathematics approach to teaching?
2. What is the difference between male mathematics teachers and their female counterparts in their use of ethnomathematics approach to teaching?
3. What is the difference between mathematics teachers in the rural areas and their counterparts in the urban areas in their use of ethnomathematics approach to teaching?

5. HYPOTHESIS

1. The proportion of mathematics teachers that are using ethnomathematics approach to teaching is not different from 50%
2. There is no significant difference between male mathematics teachers and their female counterparts in their use of ethnomathematics approach to teaching
3. There is no significant difference between mathematics teachers in rural areas and their counterparts in urban areas in their use of ethnomathematics approach to teaching.

6. MEHTODOLOGY

The design adopted for this study is survey, which is aimed at assessing mathematics teacher's use of ethnomathematics approach to teaching.

7. AREA OF STUDY

The study was carried out in Oredo, Egor and Ikpoba-Okha Local Government Area of Edo State.

8. POPULATION OF THE STUDY

The population of the study consist of all mathematics teachers in public secondary schools in Oredo, Egor and Ikpoba- Okha Local Government Areas of Edo State.

9. SAMPLE AND SAMPLING TECHNIQUE

The sample consisted of 121 mathematics teachers in 42 randomly selected public secondary schools in the three local Government Areas of Edo State. Fourteen schools each from Oredo, Egor and Ikpoba – Okah Local Government Areas of Edo State were involved.

10. INSTRUCMENT FOR DATA COLLECTON

The instrument for this study was a structured questionnaire titled "Ethnomathematics Opinion survey Questionnaire" which was designed to assess the extent to which respondents are using ethnomathematics approach to teaching. It has 12 items structured on a 4 point like scale of strongly agree, disagree and strongly disagree with an associated scores of 4,3, 2 and 1 respectively, since all items are positively worded. A

respondent with a score of 30 (12x2.5) and above is regarded as using ethnomathematics approach to teaching.

11. VALIDATION OF INSTRUMENTS

This instrument was validated by three lecturers in the department of educational Psychology and curriculum studies, University of Benin City.

12. RELIABILITY OF THE INSTRUMENT

The reliability of the instrument was established through a split half reliability test method. The study was pilot tested and a reliability coefficient of 0.83 was obtained.

13. ADMINISTRATION OF INSTRUMENT

The copies of ethnomathematics opinion survey questionnaire were personally distributed and collected by the researcher and a trained field assistant who is a graduate of mathematics. This process yielded hundred percent retrieval of administered questionnaire from sampled mathematics teachers in Oredo, Egor and Ikpoba – Okha local government Areas of Edo State,

14. METHOD OF DATA ANALYSIS

The data collected was analyzed using descriptive statistics like mean, rank, percentage, standard deviation and z- test was used to test hypothesis 1 and t -test was used to test hypothesis 2 and 3

15. PRESENTATION OF RESULTS

15.1 Research question 1:

What proportion of mathematics teachers are using ethnomathematics approach to teaching?

Table 1: The proportion of mathematics teachers that are using ethnomathematics approach to teaching.

Teachers	**N**	**(P) Sample Proportion**	**(Q) Hypothesized Proportion**
Teachers that are using ethnomathematics approach	111	$\frac{111}{121} = 0.92$	50%=0.5
Teachers that are not using ethnomathematics approach	10		

Table 1 shows that the proportion of mathematics teachers that are using ethnomathematics approach is 0.92

15.2 Null Hypothesis1:

The proportion of mathematics teachers that are using ethnomathematics approach to teaching is not different from 50%.

Table 2: Z –test analysis of the proportion of mathematics

Teacher	**N**	**(P) Sample Proportion**	**(Q) Hypothesized Proportion**	**Zcal**	**Ztab**	**Confidence interval**
Teachers that are using ethnomathematics approach	111	$\frac{111}{121} = 0.92$	50%=0.5	16.52	1.96	(0.872,0.968)
Teachers that are not using ethnomathematics approach	10					

The analysis of data in table 2 above shows that calculated value of Z (cal = 16.87) is greater than the value of the table Z (Ztabl = 1.96) at 0.05 level significance. Consequently, the null hypothesis that the proportion of mathematics teachers that are using ethnomathematics approach to teaching is not different from 50% is rejected. Hence, the proportion of mathematics teachers that are using ethnomathematics approach to teaching is different from 50%. To find the actual percentage of mathematics teaches, that are using ethnomathematics approach to teaching, the confidence interval was calculated and found to be between 87.2% and 96.8%. This means that majority of the mathematics teachers are using ethnomathematics approach to teaching.

15.3 Null hypothesis 2:

There is no significant different between male mathematics teacher and their female counterparts in their use of ethnomathematics approach to teaching.

Table 3: t-test analysis of the difference between male mathematics teachrers and their female counterparts. In their use of ethnomathematics approach to teaching.

Sex	N	Means	Sd	Df	Tcal	Ttab	Sig (2 tail test
Male	53	37.96	5.870				
Female	68	37.68	5.112	119	0.278	1.96	0.775

Table 3 shows that calculated value of t (tcal = 0.278) is less than the table t (t-tab = 1.96) at 0.50 level of significance and degree of freedom. This implies that there is no significance difference between male mathematics teachers and their female counterparts in their use of ethnomathematics approach to teaching. As a result, the null hypothesis that there is no significant difference between male mathematics teachers and their female counterparts in their use of ethnomathematics approach to teaching. As a result, the null hypothesis that there is no significant difference between male mathematics teachers and their female counterparts in their use of ethnomathematics approach is retained.

15.4 Null hypothesis 3:

There is no significant difference between mathematics teaches in rural areas and their counterpart in urban areas in their use of ethnomathematics approach to teaching.

Table 4: t-test analysis of the difference between mathematics teachers in rural areas and their counterparts in urban areas in their use of ethnomathematics approach to teaching.

Location	N	Means	Sd	Df	Tcal	Ttab	Sig (2 tail test
Urban	100	37.98	5.131		0.772	1.96	0.433
Rural	21	36.95	6.786	119			

Table 4 above indicated that calculated value of t (tcal = 0.772) is less than the table value t (ttab = 1.96) at 0.05 level of significance and 119 degree of freedom. This means that there is no significant difference between mathematics teachers in rural areas and their counterparts in urban areas in their use of ethnomathematics approach to teaching. This implies that the null hypothesis that there is no significant difference between mathematic teachers in rural areas and their counterparts in urban areas in their use of ethnomathematics approach to teaching is retained.

16. DISCUSSION OF FINDINGS

The test of hypothesis 1 shows that the proportion of mathematics teachers that are using ethnomathematics approach to teaching is different from 50%. The study also established that between 87.2% and 96.8% of mathematics teachers are using ethnomathematics approach to teaching. Furthermore, the test of hypothesis 2 shows that there is no significant difference between male mathematics teachers and their female counterparts in their use of ethnomathematics approach to teaching.

Finally, a non significant difference was also established between mathematics teachers in rural areas and their counterparts in urban areas in their use of ethnomathematics approach to teaching.

17. COUNCLUSION

The study has established that majority of mathematics teachers are using ethnomathematics approach to teaching. In other words between 87.2% and 96.8% of mathematics teachers are using the basic principles of ethnomathematics approach (teaching and learning mathematics which build on students previous knowledge, background, the role his environment plays in terms of content and method and past and present experience of his immediate environment) during teaching. If this category of teachers are exposed to the rudiments of ethnomathematics approach, that is by way of organizing seminars and workshops for them, they are likely to be more effective in their application of the instructional strategy.

This study has also shown that gender and location of teachers has no significant influence on the application of ethnomathematics approach to teaching by mathematics teachers.

18. RECOMMENDATION

1. Seminars and workshops should be organized for mathematics teachers in order to train them on how to use ethnomathematics approach in teaching mathematics
2. Curriculum planners and developers should include ethnomathematics approach in the curriculum of all institutions that offer educational courses.
3. At presents, most schools are highly populated as to the number of students in classroom. These densely populated classrooms make the use of effective teaching methods difficult for the mathematics teacher. As such the national policy on education recommendation of teahcer's students ration of 1:40 should be strictly adhered to.
4. Government should provide incentive for mathematics teachers, this is to encourage them to use innovative and efficient method in teaching mathematics.

5. Authors of mathematics should endeavour to present their work in line with the basic principles of ethnomathematics approach.

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