

Improving Primary School Pupil's Retention of Mathematics Concepts Using Exploratory Talk Approach.

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ABSTRACT

The study focuses on the influence of Exploratory talk on Primary School Pupils Retention of Mathematics concepts. The objectives of the study were; to determine level of which exploratory talk improves pupils' retention of mathematics concepts and to examine responses of teachers on the use of exploratory talk to improve pupils' retention of mathematics concepts. The study adopted ex-post facto design for the findings. A sample of 95 pupils both boys and girls were used and 20 mathematics teachers were selected. These were done through simple random sampling. The researcher developed two instruments for the study, which one for pupils consisting of 9 items and 6 items for the teachers to answer. The method used for data analysis were mean, standard deviation and t-test distribution. Results revealed that pupils do not share relevant information together and teachers do not allow learners to actively listen while they teach mathematics. At 5% level of significance results from the t-test distribution revealed that there is a significant difference in the mean scores of pupils and teachers' responses based on the use of exploratory talk approach to improve pupils' retention of mathematics concepts in the selected primary schools in Jalingo metropolis. It was recommended in this study that Mathematics teachers should encourage discussion teaching approaches in their classes to allow pupils share their beliefs and perception about a given concept and Teachers of mathematics should ensure pupils listen while they introduced and attempt to explain any mathematical concepts and calculation in the classroom. Thus, the need to discourage use of textbooks in class is quite important.

I. INTRODUCTION

Mathematics is a subject that is believed to be enjoyable when concepts are relatively connected to students' environment rather than

been abstract in nature. It offers students opportunities for creative work and moments of enlightenment and joy. When ideas are discovered and insights gained, students are spurred to pursue mathematics beyond the classroom walls since practical approach is being used as teaching method. Evidently, many pupils performed very poorly in mathematics due to one reason or the other. According to the reasons are teachers used of instruction, teaching methods and pupil – pupil discussions are limited thereby causing them to see mathematics more of irrelevant to their career pursue.

In response to the ongoing global reform in the educational and technological development of the society, Azuka, Durojaiye, Okwuoza and Jekayinfa, (2013) inscribes that teachers are expected to be the best minds of any country and mathematics should be the basic tool to achieve this national set goals. Evenly, Ogunniyi in Emaiku (2012) asserted that one of the most persistent and compelling problems besetting achievement in the teaching of mathematics in Nigeria is poor quality of teaching. In fact, many researchers like Azuka, Durojaiye, Okwuoza and Jekayinfa, (2013) believe that the main teaching method being adopted by many mathematics teachers in Nigeria is the lecture or conventional method which has its attendant shortcomings. The Lecture method is a teaching method whereby the teacher delivers verbally a prepared body of knowledge to his students who listen and jot down points from the teacher. It is however, basically teacher centered approach which encourages one-way communication, though it can be used to communicate to a large crowd of students orally or through electronic media like radio or television.

In line with the foregoing, knowing how important mathematics is to our everyday activity, retention of mathematics concepts has general influence on students' understanding of mathematics. Really, retention is the most

significant aspect teachers of mathematics need to impact on their students especially in primary schools in order to promote learning by doing and further shifting from the traditional teaching method to student centered learning. Prior to these attempt by many research studies, exploratory talk approach is not exempted out of those approaches of teaching which could substitute lecture or conventional teaching methods in our educational institutions especially in primary schools. Barnes (2008) describes exploratory talk as an opportunity for a speaker to sort out their thoughts and ideas, see how they sound, receive feedback and arrange these pieces of information and ideas into different formats. This approach can offer pupils an environment where they feel at ease to share ideas and develop understanding, whilst working alongside their peers. It is likely and crucial that all learners feel comfortable in this setting or they are unlikely to fully participate or benefit from the process.

In the current competitive and globalized higher education market, the reputational fall-out of low student retention and high student attrition figures can be damaging for institutions even in primary educations. Simon and Neil, (2013) even suggested that the days of been able to direct students to a particular pre-moderated textbooks and sections in it, are largely over; both teachers and students expect to be able to find and use information online. They suggested in their study that enabling students to engage in high-quality collaborative discussion would improve the success of their information seeking. More so, Claire, Kristine, Christian, and Gerald, (2015) observes that when students debate with their peers in the classroom (particularly when dealing with most mathematics concepts) is likely promoted as exercise necessary to their enculturation into the scientific world, perceived as specific community of practice. Antti, (2012) interestingly described exploratory talk as a prominent characterization of an educationally valuable type of talk, which occurs when partners (pupils) engage critically but constructively with each other ideas, statements and suggestions are offered for joint consideration. These maybe challenged and counter-challenged, but the challenges are justified and alternative hypotheses are offered. Some important branches of mathematics like probabilities and statistics, geometry and algebra among others needed teachers to implore this learning approaches since it involves more publicly accountable and reasoning is more visible in the talk. In primary education, pupils prefer more of interactive classroom than teaching mathematics concepts based on abstracts.

II. STATEMENT OF THE PROBLEM

Teaching mathematics through collaboration and interaction among pupils in primary school remain very poor. Parents, educational institutions and various individuals are not satisfied with the few improvement and innovation in recent times especially the introduction of various teaching approaches as pupils in primary schools are yet to exhibits highly intellectual abilities and applicability of mathematical concepts to their everyday life. The researcher in attempt to contribute to knowledge intends to used exploratory talk approach to find out how it can improve in retention of mathematical concepts. Other recent researchers such as Antti, (2012); Claire, Kristine, Christian, and Gerald, (2015) have contributed on identifying some significant role of exploratory talk in the teaching and learning of sciences and mathematics is not exclusive. Out of their contributions, the present research work sought to used exploratory talk approach to improve primary school pupils' retention of mathematics concepts after realizing that poor interaction among pupils can lead to their less retention of mathematical concepts. Therefore, the problem of this study is put in question form as; How can used of Exploratory talk among pupils in primary schools improved their retention level of mathematical concepts.

Research Questions

Two research questions were formulated to guide the research study, which are:

- i. what is the extent to which Exploratory talk among Primary School Pupils can improved their retention of Mathematics Concepts?
- ii. what are the responds of Mathematics Teachers on the use of Exploratory talk to improve pupils' retention of mathematics concepts?

Hypothesis

The hypothesis was tested at 5% level of significance.

- i. There is no significant difference in the Mean scores of Pupils and Teachers' Responds based on the use of exploratory talk to improve pupils' retention of mathematics concepts.

III. METHODS AND MATERIAL

The Ex post facto design was used for this research study. The sample is made up of 95 pupils and 20 teachers in four primary schools, which were selected randomly within Jalingo metropolis. The selection was done using hart card both male and female have chances to picked the possible card used for the study based on chance. The

research instruments were 09-item questions based on Pupils Responds on used of Exploratory Talk (PRUET) and 06 – item questions were based on Teachers Used of Exploratory talk to Improve Pupil retention (TUETIPR). All the research questions were answered using means and standard deviation with $\bar{x} \geq 2.5$ is accepted and when less than 2.50 is disagree. This is used to view opinion of the respondents. T-test distribution was used to

test hypothesis of the two relationships (pupils and teachers means responds).

IV. RESULTS

Research Question 1

what is the extent to which Exploratory talk among Primary School Pupils can improved their retention of Mathematics Concepts?

Table 1: Mean and Standard Deviation of Pupils Responds on used of Exploratory Talk Approach.

S/N	Items	SA	A	D	SD	\bar{x}	δ	Decision Rule
1	Everyone listens actively in our class	50	30	10	5	3.32	0.7424	Accepted
2	We ask question of one another	40	20	15	20	2.84	1.3961	Accepted
3	We share all relevant information together	20	21	14	40	2.22	1.4353	Disagree
4	Ideas maybe challenging but we address them even in the class	30	40	5	20	2.84	1.1856	Accepted
5	Everyone is encouraged to contribute	43	26	20	06	3.12	0.9024	Accepted
6	Ideas and opinions are treated with respect	45	24	14	12	3.07	1.1209	Accepted
7	There is always an atmosphere of trust between ourselves	40	18	16	21	2.81	1.4378	Accepted
8	There is sense of shared purpose	60	14	20	01	3.40	0.7242	Accepted
9	The groups teacher normally shared joint decisions together.	32	07	20	36	2.37	1.6642	Disagree

Results from the above table indicates that all the items were accepted based on the decision rule of 2.50 point and only items in S/N 3 and 9 respectively were disagree. This implies that, everyone listens actively in our class,we ask question of one another,Ideas maybe challenging but we address them even in the class, everyone is encouraged to contribute, Ideas and opinions are treated with respect, there is always an atmosphere of trust between ourselves and There is sense of

shared purpose are above the criterion mean score of 2.50 points. The respondents disagreed that they share all relevant information together and the groups teachers normally shared all them joint decisions together.

Research Question 2

what are the responds of Mathematics Teachers on the use of Exploratory talk to improve pupils' retention of mathematics concepts?

Table 2: Mean and Standard Deviation of Mathematics Teachers on the use of Exploratory Talk to Improve Pupils retention of Mathematics Concepts.

S/N	ITEMS	SA	A	D	SD	\bar{x}	δ	Decision Rule
1	My pupil listens actively.	02	03	08	07	2.00	0.212	Disagree
2	The pupils in my class ask questions when necessary.	10	02	04	04	2.90	0.3317	Accepted

3	The pupils like sharing relevant information	08	06	03	03	2.85	0.3202	Accepted
4	The ideas one pupil give is challenged by others in my class.	03	04	07	06	1.95	0.3535	Disagree
5	I encourage everyone in my class to ask questions.	08	08	02	02	3.10	0.2121	Accepted
6	I allow my pupils to treat every contribution with respect.	03	01	04	12	1.75	0.2958	Disagree

Results in table 2 shows that mathematics teachers in the study area believes that their pupils listen actively, the ideas one pupil give is challenged by others in their class, and they allow their pupils to treat every contribution with respects all were disagreed at the acceptance level of 2.50 points. While items in S/N 2, 3, and 5 were all

accepted based on the criterion mean scores of 2.50 points.

Research Hypothesis

There is no significant difference in the Mean scores of Pupils and Teachers' Responds based on the use of exploratory talk to improve pupils' retention of mathematics concepts.

Table 3: T-test Distribution for Sum of Mean and Standard Deviation of Pupils and Teachers Responds on the Use of Exploratory talk to Improve Pupils Retention of Mathematics Concepts

Responds	N	\bar{X}	SD	Df.	t-cal.	t-crit.	Remarks
Teachers	20	14.55	1.7253				
				113	9.9066	1.980	**
Students	95	25.99	10.6089				

The above analysis shows the t-test distribution for mean and standard deviation of pupils and teachers' responds on the use of exploratory talk to improve pupils' retention of mathematics concepts. However, the $t\text{-cal.} > t\text{-crit.}$ Which means that the ultimate hypothesis was accepted that there is a significant difference in the mean scores of pupils and teachers' responds based on the use of exploratory talk approach to improve pupils' retention of mathematics concepts in the selected primary schools in Jalingo metropolis.

V. DISCUSSION OF MAJOR FINDINGS

Findings in this study revealed that everyone listens actively in the selected classes used for this research, they ask question of one another, Ideas maybe challenging but they address them even in the class. According to the pupils, everyone is encouraged to contribute, Ideas and opinions are treated with respect, there is always an atmosphere of trust between themselves and there

is sense of shared purpose. This is related to the summation of Claire, Kristine, Christian, and Gerald, (2015) who hinted that when students debate with their peers in the classroom (particularly when dealing with most mathematics concepts) is likely promoted as exercise necessary to their enculturation into the scientific world, perceived as specific community of practice.

Again, teachers of the selected pupils believe that the pupils in their classes ask questions when necessary, the pupils like sharing relevant information and they encourage everyone in their classes to ask questions. In such case, test of hypothesis showed that there is a significant difference in the mean scores of pupils and teachers' responds based on the use of exploratory talk approach to improve pupils' retention of mathematics concepts in the selected primary schools in Jalingo metropolis. Thus, findings also show that pupils do not actively listen while teacher teaches mathematics and that they do not

allow pupils to treat every contribution with respect. Hence, the study is not in line with the suggestion of Simon and Neil, (2013) who viewed that enabling students to engage in high-quality collaborative discussion would improve the success of their information seeking.

VI. CONCLUSION AND RECOMMENDATIONS

In light of the findings out of the answered research questions, it is believed that teachers and pupils mean responds on the use of exploratory talk to improve pupils' retention of mathematics concept are not the same. As such, it is concluded that exploratory talk improves retention of mathematics concepts but most of the teachers are those who do not attained to such talk among their pupils in other to arouse more positive behaviour on them in the selected schools in Jalingo metropolis. The following recommendations were hereby made:

Mathematics teachers should encourage discussion teaching approaches in their classes to allow pupils share their believed and perception about a given concept.

Teachers of mathematics should ensure pupils listen while they introduced and attempt to explained any mathematical concepts and calculation in the classroom. Thus, the need to discourage use of textbooks in class is quite important.

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