



Influence of Planned Repetition Skill on the Academic Performance of Secondary School Physics Students in Khana LGA, Rivers State, Nigeria

O. L. Gbarato^{1*} and N. N. S. Mandah²

¹*Department of Physics, Faculty of Natural and Applied Science, Ignatius Ajuru University of Education, Port Harcourt, Nigeria.*

²*Department of Curriculum Studies and Instructional Technology, Faculty of Education, Ignatius Ajuru University of Education, Port Harcourt, Nigeria.*

Authors' contributions

This work was undertaken with collaboration between the two authors. Author OLG designed the study, wrote the protocol and supervised the work. Authors OLG and NNSM did all the experimental work and performed the statistical analyses of the study. Author OLG wrote the first draft of the manuscript and managed the literature searches. Author NNSM edited the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

This study assessed the influence of Planned repetition skill on the academic performance of students in secondary school Physics in Khana Local government Area of Rivers State, Nigeria, using five research questions and one hypothesis. The population consists of teachers and Physics students in the secondary section. Out of the 240 students in the sample area, 160 of them were selected in addition to the 30 teachers selected from the total of 39 teachers to make up the sample size, with the aid of random sampling technique. The questionnaire titled "Application of Planned

*Corresponding author: E-mail: olive582002@yahoo.com;

Repetition Skill Questionnaire" (APRSQ) was part of the instrument and a topic on fundamentals of motion in physics was used for the quasi- experimental study. The mean (\bar{X}) was used to analyse the research questions and the z – test analysis for the hypothesis which was tested at .05 level of significance. The findings show that Physics teachers have low awareness of the concept and application techniques of the Planned repetition skill and that this and other factors militate against the utilization of this teaching skill. Based on this it was recommended that the government and other stakeholders in the education sector should fund and organize trainings, workshops and seminars for teachers on this and other teaching skill; measures should be put in place towards ensuring that professional teachers are employed, among others.

Keywords: Influence; planned repetition skill; academic performance; students; secondary school; physics.

1. INTRODUCTION

1.1 Background of the Study

The importance of education as a tool for the development of individuals to make them suitable as members of the society cannot be over-emphasized [1,2,3,4]. This is largely because education equips the individuals with adequate knowledge, abilities, behaviours, skills or talents to function effectively in their immediate environment and in the larger society by maintaining or improving upon the levels already attained [5,6]. There is no doubt these educational goals can only be achieved through teaching, learning and various forms of training in schools, colleges and skills acquisition centres where the skills and knowledge necessary to perfect the nature of humans as a suitable members of the larger society can be developed. Through teaching skills, certain attitudes, knowledge, ideas that will influence desirable changes in behaviour of the learner can be achieved [7] through interaction between the teacher and learners [8]. Therefore, the ability of teachers to adopt models, methods, techniques, strategies and teaching skills that can engender effective learning is a significant step towards achieving the specific objectives of the lesson. This study is on the influence of the Planned Repetition skill as a classical teaching skill that assists in producing desirable learning outcomes during lesson presentations. [9] had defined teaching skills are those overt specific behaviours, activities or actions exhibited in the classroom, by the teacher with response from learners, to facilitate lesson presentation so as to achieve the specific objectives of the lesson. Other teaching skills needed to achieve desirable learning outcomes during lesson presentations include set induction, closure, reinforcement, non-verbal communication and the reinforcement

skill, among others. The Planned repetition skill, which is the focus of this study engenders mastery learning of the topic taught by the teacher if applied in a desired direction [10,11]. This means that the effective application of the Planned Repetition skill will reduce forgetting and enhance remembering of facts, illustrations, definitions and formulas [12,13]. It is believed that the application of the Planned repetition skill by teachers will influence the academic performance of Physics students. One of applications was undertaken by [14] to evaluate the use of this skill to remedy lack of understanding of French in year one courses in higher institutions. Thus with the high rate of low performance of secondary school Physics students in external examinations, it is doubtful if the teachers are applying this teaching skill. Hence, this study is aimed at evaluating the influence of the Planned repetition skill on the academic performance of students in secondary school Physics in Khana Local Government Area of Rivers State, Nigeria.

1.2 Statement of Problem

Planned repetition is one of the teaching skills that can be applied by teachers in a teaching and learning process. The essence of its application is to enhance mastery learning as a result of repetition of key points, illustrations and definitions which usually assists learners to recall these facts easily. It is expected that every teacher ought to apply various teaching skills to enhance lesson presentation and to achieve the specific objective of the lesson- a mechanism through which the academic performance of learners can be enhanced. However, it is suspected that most teachers are not conversant with the concept and application techniques of this and other teaching skills even as professional teachers. Some teachers undermine

the benefits of this teaching skill thereby leading to low academic performance of secondary school students in many science subjects, especially Physics. It is on this premise that the researchers are interested in finding out the influence of Planned repetition skill on the academic performance of students in secondary school Physics in Khana Local Government Area of Rivers State.

1.3 Significance of the Study

The findings of this study will benefit teachers, policy making bodies, researchers, education administrators and other stakeholders in the education sector to obtain valuable information on the influence of Planned Repetition skill on the academic performance of students. This research also reveals Information about how it can be applied and problems affecting its application. Based on the findings, problems affecting its application can be determined and this will form the basis for providing adequate training and retraining programmes on this and other teaching skills. Researchers will also find information from this research work very valuable as reference materials for further research.

1.4 Purpose of the Study

The purpose of this study is to:

- Find out the extent of awareness of the Planned Repetition skill by Physics teachers in Khana Local Government Area.
- Find out the extent of utilization of the Planned Repetition skill by Physics teachers in Khana Local Government Area.
- Find out the factors that militate against the utilization of the Planned Repetition skill by Physics teachers.
- Proffer solutions to the factors that militate against the utilization of Planned Repetition skill by Physics teachers.
- Ascertain the influence of Planned Repetition skill on the academic performance of Secondary School Physics students.

1.5 Research Questions

The following research questions were formulated to guide this research work;

- To what extent are Physics teachers aware of the concept of the Planned Repetition skill?
- To what extent do Physics teachers utilize the Planned Repetition skill?
- What are the factors that militate against the utilization of the Planned Repetition skill?
- What are the solutions to the problems that militate against utilization of Planned Repetition skill?
- What influence does the Planned Repetition skill have on the academic performance of students in secondary school Physics?

1.6 Hypothesis

There is no significant influence of the application of Planned Repetition skill on the academic performance of secondary school Physics students in Khana Local Government Area of Rivers State.

2. REVIEW OF RELATED LITERATURE

2.1 Concept of Teaching Skills and Planned Repetition Skill

Teaching skills are intended to be used in a teaching and learning process to contribute to the mastery and proper application of ideas, principles, information and facts. Thus the Planned Repetition Skill is a classical teaching skill that teachers should understand, adopt and apply appropriately because of its role in the enhancement of mastery learning. This position was supported by [15] in their study which investigated the number of repetitions required to master multiplication math facts by analyzing data from 15402 3rd, 4th and 5th graders using National database, with result obtained indicating that students with lower math skills require significantly more repetitions. [10] also strongly supported this position by stating that Planned Repetition Skill will engender mastery learning if applied appropriately and in the desired direction. The effectiveness of the Planned Repetition Skill in engendering mastery learning is also supported by the research works of other behavioural, cognitive and humanistic psychologists who are interested in improving students' academic performances in schools. The Planned Repetition Skill will help slow and unmotivated students to learn like their smart, fast and motivated peers. [16] corroborated this

position in their research work which developed a three-phase interrogative task-based course aimed at achieving communicative effectiveness by combining E-activities with facebook online chat in a computerized environment and by observing the effects on L2 production of learners using some computer-mediated communication settings through the manipulation of task-repetitions. They concluded that task repetition helps to enhance the performance of learners in syntactic variety and lexical complexity. In such teaching and learning situations, there is significant improvement in students' behavioural and learning outcomes as well as teachers' chances for long-term social and personal prosperity. Through the effectiveness of this type of process, according to [17], students acquire personal competencies that generate life-long improvement in diverse areas. [18] in their study evaluated the retention of knowledge and skills imparted to first year medical students through basic life support training through a procedure that comprise of faculty training, assessment of students' knowledge through a pretest, lecture, demonstration, hands-on training and posttest for assessment of knowledge gained. The posttest result indicated a significant gain in knowledge through successive training sessions in life saving skills.

2.2 Forms of the Planned Repetition Skill

There are four forms of the Planned Repetition Skill, such as simple-, spaced-, cumulative- and massed repetition, each of which can be applied for a specific purpose depending on what is to be achieved. Simple Repetition (SR) can be applied in a relatively small class size where students are made to repeat particular points, concepts and principles encountered in the lesson. In spaced Repetition (Sp.R), facts are repeated at intervals to increase the chances of remembering. In this type of repetition, the spacing interval is important as appropriate spacing of the repetition interval helps in achieving the effectiveness of the skill. [10] studied the spacing and repetition effects in human memory and stated that the retention interval must not be too short. [19] defined the ideal spacing interval to be the same as the retention interval, the retention interval being the time lag between the last presentation and when the information is expected to be produced. In cumulative repetition (CR), a sequential review of all the key points in a particular aspect of the presentation is undertaken before the introduction of new

concepts. Massed repetition (MR) is usually applied at the end of the lesson to serve as a tool for summarizing the major points of the lesson. It is important to note that proper application of the Planned Repetition Skill is required at all levels of the educational system, although the frequency and extent of its application actually depends on the complexity of the content of learning materials.

2.3 Merits of the Planned Repetition Skill

Despite some inherent limitations of this teaching skill, its application is desired in any teaching and learning situation because it leads to mastery learning by reducing or outrightly preventing the loss of ability to retrieve from either Short Term Memory (STM) or Long Term Memory (LTM). Therefore, its application in any teaching/learning process will enhance retrieval abilities, which is a process of recovering information from the memory, in learners. This was the reason why the researchers believed that proper application of the Planned Repetition Skill will have positive influence on the academic performance of Physics students, by assisting to capture student's attention and motivate them to participate actively in the lesson. It will also improve the study pattern of learners and increase student confidence by assisting them to develop their own learning experiences.

3. RESEARCH METHODOLOGY

The research design adopted for this study was both descriptive survey and quasi-experimental research designs. The population for the study was One Hundred and Sixty (160) students selected from a total population of two hundred and forty (240) students in Senior Secondary School One (SSI) offering Physics as one of the major science subjects. In sample and sampling technique, the Local Government Area has thirty two (32) public Secondary Schools out of which twenty (20) schools were selected through the balloting technique. Eight students were selected from each school through the random sampling technique to give 160 students and thirty (30) Physics teachers selected from the total of thirty Nine (39) to make up the sample size. The questionnaire was one of the instruments used for data collection. The instrument was divided into two sections, section A titled preliminary data contained information on the personal data of the respondents, while section B contained information on planned repetition skill with a

response mode on the modified four-point likert scale comprising of: Agree (4), Strongly Agree (3), Disagree (2) and Strongly Disagree (1). The research instrument also had “multiple-choice objective questions in Physics designed to test the influence of the Planned repetition skill on the academic performance of the students.

The sample size of the students of 160 was divided into two groups through the balloting technique to obtain the Group A-control group and Group B-experimental group of eighty (80) students each. Group A was taught a topic on Fundamentals of Motion for a minimum of three (3) periods in a week, with the application of the Planned repetition skill while Group B was taught without the application of the planned repetition skill for the same duration. At the end of the teaching a post test was administered differently to the two groups based on the topic. The instruments mentioned above were validated and the correction effected. The test-retest type of reliability was applied to a different set of 20 students outside the Local Government Area under consideration, the scores were collated and the Pearson’s Product Moment correlation used to analyse the data. The result obtained showed a correlation coefficient that ranged between 0.70 and 0.88, values considered high enough to justify the use of this instrument for the study. The questionnaire titled ‘Application of Planned Repetition Skill Questionnaire’ (APRSQ) was administered to the 30 teachers and 160 students respectively, with the aid of a research

assistant, and all was retrieved after filling. None of the questionnaires was mutilated.

The mean and standard deviation was used to analyse the Research Questions while Z-test statistical tool was used to analyse the hypothesis

3.1 Research Question 1

To what extent are Physics teachers aware of the concept of Planned Repetition skill?

Table 1 shows the mean response on the extent of awareness of teachers on the concept of the Planned Repetition skill. The responses revealed that statement 2 has a mean score of 3.23; statement 3 has a mean score of 3.10; statement 4 has a mean score of 2.93 while statements 1, 5 and 6 has mean scores of 2.83, 2.60 and 2.5 respectively. These responses show that the teachers in the study area have low awareness of the concept of the Planned Repetition skill.

3.2 Research Question 2

To what extent do Physics teachers in the study area utilize Planned Repetition skill in the teaching and learning of Physics?

Table 2 reveals the mean score response of the respondents on the utilization of planned

Table 1. Mean scores of respondents on the extent of physics teachers’ awareness of the concept of the planned repetition skill

S/N	Statement	A (4)	SA (3)	D (2)	SD (1)	CR	N	X
1.	Most Physics teachers have little or no knowledge of the concept of Planned Repetition Skill	10	9	7	4	85	30	2.83
2	Most Physics teachers deliberately do not adopt the Planned Repetition Skill because it is time-consuming.	15	9	4	2	97	30	3.23
3	Most Physics teachers are not aware that intermittent repetitions of difficult ideas, definition, concepts during physics lesson will enhance students’ understanding	14	8	5	3	93	30	3.10
4	Most Physics teachers do not summarize the main points of their lesson at the end of teaching as a means of massed repeating the lesson.	11	9	7	3	88	30	2.93
5	Some Physics teachers do not ask students to repeat certain points made by the teacher in the class	10	8	4	8	80	30	2.6
6	Some Physics teachers do not repeat previous facts learnt that relates to the current lesson	10	6	3	11	75	30	2.5

Table 2. Mean scores of respondents on the extent of utilization of the planned repetition skill by physics teachers in the study area

N/SO	Statement	A (4)	SA (3)	D (2)	SD (1)	CR	N	X
1.	Professional Physics teachers should utilize the Planned Repetition Skill while teaching.	12	10	3	5	89	30	2.96
2	Planned Repetition Skill ought to be utilized because it enhances mastery learning among the students.	16	8	4	2	98	30	3.26
3	The various forms of the Planned Repetition skill should be utilized by teachers during teaching/learning.	15	5	3	7	88	30	2.93
4	The proper use of the Planned Repetition Skill will enhance remembering of key facts of the lesson.	20	7	0	3	104	30	3.46
5	The Planned Repetition Skill should be appropriately applied and at the right time to achieve the aim of its utilization in the lesson.	14	6	6	4	90	30	3.00
6	The Planned Repetition Skill should be effectively used by teachers during each lesson delivery to summarise key definitions, illustrations, equations and statements to reduce forgetting.	17	5	5	3	96	30	3.20
7	The Planned Repetition Skill if effectively utilised will help both fast and slow learners to have deeper understanding of the lesson.	19	8	3	0	106	30	3.50

Table 3. Mean scores of respondents on the factors that militate against effective utilization of planned repetition skill

S/N	Statement	A (4)	SA (3)	D (2)	SD (1)	CR	N	X
1.	Time period of 40 minutes duration for each lesson is not enough to effectively apply the Planned Repetition on skills.	14	10	3	3	95	30	3.16
2	Its application consumes energy and time.	12	10	3	5	89	30	2.96
3	Lack of regular training, seminar and workshop on the use of Planned Repetition Skill.	18	5	4	3	98	30	3.26
4	Lack of fund to organize training and retraining of teachers on the use of Planned Repetition Skill.	15	8	4	3	95	30	3.16
5	Teachers poor attitude to teaching	8	5	15	2	79	30	2.63
6	Lack of professional qualification by teachers.	13	5	10	2	89	30	2.96
7	Irregular supervision of teachers	12	10	4	4	88	30	2.93
8	The use of Planned Repetition regularly can breed monotony and boredom during learning	9	7	5	9	76	30	2.50

repetition skill by teachers. The responses show that statements 7, 4, 2, 6 and 5 has mean scores of 3.5, 3.46, 3.26, 3.20 and 3.00 respectively while statements 1 and 3 has mean scores of 2.96 and 2.93 respectively. These responses revealed that utilization of the Planned Repetition skill by Physics teachers in the study area during lesson delivery is low.

3.3 Research Question 3

What are the factors that militate against effective utilization of planned repetition skills?

Table 3 above shows the mean scores of respondents on the factors that militate against

the use of the Planned Repetition skill among teachers in the study area. The responses revealed that statements 1 and 4 has a mean score of 3.16 each; statements 2 and 6 has a mean score of 2.96 each while statements 3, 7, 5 and 8 has mean scores of 3.26, 2.93, 2.63 and 2.50 respectively. From the above analysis, it is seen that a lot of factors militate against the effective utilization of the Planned Repetition skill by teachers in the study area.

Table 4 shows the mean score of respondents on the solutions to the factors that militate against effective utilization of the Planned Repetition skill. The responses revealed that statements 1, 3 and 4 has mean scores 3.00 each; statements 2 and 6 has mean scores of 2.86 each while statement 5 has a mean score of 3.30. This result reveals that these statements can be used as solutions to the factors militate against effective utilization of the Planned Repetition skill.

3.4 Research Question 4

What are the solutions to the factors that militate against utilization of planned repetition skills?

Table 4. Mean scores of respondents on the solutions to the factors that militate against utilization of planned repetition skills

N/SO	Statement	A (4)	SA (3)	D (2)	SD (1)	CR	N	X
1.	Increased period of lesson to allow for effective application of the Planned Repetition Skill in the class.	10	9	6	5	84	30	3.00
2.	The use of Planned Repetition Skill should be adequately planned to reduce energy consumption	11	9	5	5	86	30	2.86
3	There should be regular training seminar and workshop on the use of Planned Repetition Skill.	13	7	6	4	89	30	3.00
4	There should be adequate funding for the organization of regular training and retraining of teachers on the use of planned repetition Skill.	15	5	2	8	87	30	3.00
5	Emphasis should be placed on the acquisition of professional qualification by teachers during employment and while in service.	17	8	3	2	100	30	3.30
6	There should be regular supervision of teachers to during teaching to ensure that the Planned Repetition Skill is effectively utilized.	10	9	8	3	86	30	2.86

Table 5. Mean score of respondents on the influence of the planned repetition skill on the academic performance of secondary school physics students

N/SO	Statement	A (4)	SA (3)	D (2)	SD (1)	CR	N	X
1.	The use of Planned Repetition Skill will help students participate actively in the lesson.	19	7	4	0	105	30	3.50
2	Application of the Planning Repetition Skill will enhance remembering among students during and after lesson delivery	13	6	7	4	88	30	2.90
3	The Planned Repetition enhances proper mastery of the contents of the lessons by students.	16	7	3	4	95	30	3.16
4	Effective application of Planned Repetition Skill will enhance LTM and STM recall.	10	10	9	1	89	30	2.96
5	The use of planned Repetition Skill engenders confidence both on the teacher and students.	12	5	5	8	81	30	2.70
6	Planned Repetition Skill helps to capture students' attention during lessons.	10	6	0	14	72	30	2.40
7	Adequate use of Planned Repetition Skill reduces forgetting monotony and boredom during the lesson.	11	10	05	04	88	30	2.90

Table 6. Mean, standard deviation and Z-test scores of the experimental and control group on significant influence of planned repetition skill on the academic performance of secondary school physics students

Planned repetition	mean \bar{X}	standard deviation	N	Z-test
Experimental group	14.5	3.06	80	9.91
Control group	10.0	2.67	80	

3.5 Research Question 5

What influence does the Planned Repetition skill have on the academic performance of Secondary School Physics students?

The Table 5 shows the mean score of the influence of planned repetition skill on academic performance of secondary school Physics students. The responses revealed that statements 2 and 7 has mean scores of 2.90 each while statements 1, 3, 4, 5 and 6 has mean scores of 3.50, 3.16, 2.96, 2.70 and 2.40 respectively. The responses show the extent to which the Planned Repetition skill can influence the academic performance of Physics students.

3.6 Hypothesis 1

There is no significant influence of the application of planned repetition skill on academic performance of secondary school physics students in Khana Local Government Area of Rivers State.

At .05 level of significance the critical value of Z is 1.81 and the Z-calculated is 9.91. Since the Z-calculated value of 9.91 is greater than the critical value of 1.81, the null hypothesis is hereby rejected. This means that there is a significant influence of the Planned Repetition Skill on the academic performance of Secondary School Physics students in the Khana Local Government Area of Rivers State.

4. DISCUSSION OF FINDINGS

The findings of this study, aimed at determining the influence of the Planned repetition skill on the academic performance of Secondary School Physics students, is here discussed according to each of the research questions as shown below.

4.1 Extent of Physics Teachers' Awareness of the Concept of the Planned Repetition Skill

The results of research question one (Table 1) that sought to investigate the extent of

awareness of the Planned repetition skill among Secondary School Physics teachers in the study area showed that all the statements have their mean score greater than 2.50. These results revealed that teachers' awareness of the concept and application procedures of this teaching skill is low. This finding is based on the mean scores of the statements in Table 1, such as statement 1- most Physics teachers have little or no knowledge of planned repetition skill; Statement 2- most Physics teachers do not deliberately adopt the Planned Repetition because it is time-consuming; Statement 3- most Physics teachers are not aware that intermittent repetitions of difficult ideas, definitions and concepts during Physics lessons will enhance students' understanding; statement 4- most Physics teachers do not summarize the main points of their lesson at the end of the lesson presentation; statement 5- some Physics teachers do not ask students to repeat certain important points made by the teachers in the class and statement 6- some Physics teachers do not repeat previous facts learnt that relates to the current lesson.

This finding is in line with that of [18] who, in their study aimed at investigating poor awareness about basic life support among medical graduates through early exposure to such life-saving skills and subsequent reinforcement of their knowledge in succeeding training sessions, had posited that there was significant gain in knowledge resulting from Repetitions of training sessions. [20], had similarly identified lack of professional qualifications among teachers and lack of or inadequacy of training and retraining programmes (in forms of seminars and workshops) as some of the factors that hinders teachers' extent of awareness and knowledge about effective application procedures of the Planned Repetition Skill. The result of this study may not be unconnected to the fact that many of the teachers may not have obtained the requisite professional teaching skills and qualifications.

4.2 Extent of Utilisation of the Planned Repetition Skill by Physics Teachers

Research question two (Table 2) investigated Physics teachers' extent of utilization of the Planned Repetition in the study area and have mean scores of respondents to all the statement above 2.50. These results reveal that utilization of the Planned Repetition by Physics teachers during lesson delivery is low. This finding is based on the mean scores of the statements in Table 2, such as statement I- professional teachers should utilize Planned Repetition Skill while teaching; statement II- Planned Repetition Skill ought to be utilized by Physics teachers because it enhances mastery learning; statement 3- the various forms of the Planned Repetition Skill should be utilized by Physics during the teaching/learning; statement 4- proper utilization of Planned Repetition Skill will enhance remembering of key facts of the lesson; statement 5- Planned Repetition Skill should be appropriately applied; statement 6- the Planned Repetition Skill should be effectively utilized by Physics teachers to summarise key definitions, illustrations, equations and statements thereby reducing forgetting and statement 7-the Planned Repetition Skill will assist fast and slow learners to have deeper understanding of the lesson if effectively utilized. This finding may not be unconnected to the fact that Physics teachers have not been trained on the concept and application of the Planned Repetition Skill. This result is in line with the findings of [20,16] who separately agreed that regular training and re-training of teachers through workshop and seminars will enhance teachers' knowledge on the utilization of this teaching skill.

4.3 Factors that Militate Against Effective Utilisation of the Planned Repetition Skill

Research question three (Table 3) sought to identify the factors that militate against the effective utilization of the Planned Repetition Skill and have mean scores of respondents to the statement being above 2.50. These results show that many factors militate against the effective utilization of the Planned Repetition Skill. This finding is based on the mean scores of respondents to the statements in Table 3, such as statement 1-inadequacy of lesson period of 40 minutes for lesson presentation and regular application of the Planned Repetition Skill; statement II- its application consumes energy and time; statement 3- lack of regular training,

seminars and workshop on the concept and application procedures of the Planned Repetition Skill; statement 4- lack of funds for organization of training and re-training of teachers; statement 5- teachers' poor attitude to teaching; statement 6-lack of professional qualifications by teachers; statement; statement 7- irregular and inadequate supervision of teachers and statement 8- regular use of the Planned Repetition Skill breeds monotony and boredom during learning. The finding is in line with the assertion by [9] that boredom, monotony and teachers' poor attitude to teaching are limitations to the effective utilisation of the Planned Repetition Skill.

4.4 Solutions to the Factors that Militate Against Effective Utilisation of the Planned Repetition Skill

Research question four (Table 4) seek to identify the solutions to the factors that militate against the effective utilization of the Planned Repetition Skill and have mean scores of the respondents' statements being above 2.50. These results show that the statements can seriously assist to alleviate these factors. The solutions identified, as shown in the statements, include statement 1-slight increase in lesson duration to allow for effective application of the repetition skill; statement 2- the utilization of the Planned Repetition Skill should be adequately plan to reduce energy consumption; statement 3- there should be regular training, seminars and workshops on the use of Planned Repetition Skill; statement 4- there should be adequate funding for the organization of regular training and re-training of teachers on the use of the Planned Repetition Skill; Emphasis should be placed on the acquisition of professional qualifications by teachers and statement 6- there should regular supervision of teachers during teaching to ensure that the Planned Repetition Skill is effectively utilized. This result implicated the stakeholders in the education sector such as the government, education boards and curriculum planners on their inability to fund the training of teachers and review the curriculum from time to time to suit the current changes emanating from the teaching and learning process. There should also be adequate supervision of the teachers. This finding is in line with [21,22] who had separately asserted that there is need for adequate funding of teacher education programmes, which is pertinent because of the role of teachers in the education and in the overall development of the nation.

4.5 Influence of the Planned Repetition Skill on the Academic Performance of Secondary School Physics Students

Research question five (Table 5) sought to evaluate the influence of the Planned Repetition Skill on the academic performance of Secondary School Physics students and have mean scores of respondents to the statements being above 2.50, which Shows that the Planned Repetition Skill influences the academic performance of Secondary School Physics students. This result is based on the mean scores of the respondents to the statements in Table 5 such as statement1- utilization of the Planned Repetition Skill helps students participate actively in lessons; statement2- application of the Planned Repetition Skill will enhance remembering among students; statement 3- Planned Repetition skill enhances proper mastery of lesson content; statement 4- effective application of the Planned Repetition Skill enhance LTM and STM recall, statement 5- the use of the Planned Repetition Skill engenders confidence in both the teachers and students, statement 6- the Planned Repetition Skill helps capture students' attention and statement 7- adequate use of the Planned Repetition Skill reduces forgetting, monotony and boredom during the lesson . These findings corroborates those of [18,16,15] who had separately posited that repetitions result to significant gain in knowledge, enhance learners' performance and lead to increase in skills.

The hypothesis was analysed using Z-test statistics and the result of the analysis (as shown in Table 6) show that the calculated z-value of 9.91 is greater than the Z-critical (or table) value of 1.82. This finding indicates that there is a significant influence of the Planned Repetition Skill on the academic performance of Secondary School Physics Students.

5. CONCLUSION

This study was a descriptive and quasi experimental one that focused on the determination of the influence of the Planned Repetition Skill on the academic performance of Secondary School Physics students in the Khana local government Area of Rivers State, Nigera, from the findings, it can be concluded that:

- Most teachers have little or no knowledge of the Planned Repetition Skill
- The extent of utilisation of the Planned repetition by Physics teachers is low

- A lot of factors were identified as militating against the effective utilization of the Planned Repetition Skill by secondary school Physics teachers.
- The study also proffered some solutions to the identified factors that militate against the effective utilization of the Planned Repetition Skill.
- The study also revealed that the Planned Repetition Skill has significant influence on the academic performance of Secondary School Physics students.
- The result of the hypothesis reveals that there is significant influence of the Planned Repetition Skill on the academic performance of Secondary School Physics Students in the Khana Local Government Area of Rivers State, Nigeria.

6. RECOMMENDATION

Based on the findings of the study and the conclusion reached, the following recommendations were made:

- There is need to have adequate orientation of teachers, especially the newly recruited ones, on the concept and application of the Planned Repetition Skill during lesson delivery.
- There is need for the supervisory board for teachers in the Ministry of Education to ensure that the identified solutions to the problems that militate against effective utilization of the Planned Repetition Skill is duly considered and incorporated into their supervision manual to ensure adherence.
- The government and other non-governmental organizations as well as other well-meaning individuals should fund the training, retraining, workshop and seminars for teachers on the utilization of Planned Repetition Skill.
- Curriculum planners, the education board should constantly review the delivery process and supervise the teachers while in the classroom especially on their usage of the Planned Repetition Skill. This exercise will show how well or otherwise the teachers is utilizing the Planned Repetition Skill.
- Physics teachers should be taught by experts in teacher education on the concepts and application mechanisms, vis-à-vis its merits and demerits, to enable

teachers have adequate knowledge on this important teaching skill.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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APPENDIX

Objective multiple test items on physics

1. It is a fact that objects in real world appear to be in a continual state of relative motion.
True False
2. -----is a type of motion in which every part of the object moves in the same direction
3. Motion can take place in one two and three dimension
True False
4. Vibratory motion is defined as -----

5. Rotation motion occurs when a body moves about a -----axis
6. A typical example of rotational motion can be seen when-----

7. The motion of objects may sometimes be combinations of two different types of motion
True False
8. Roller a bird flies, its wings combined -----and -----motion.
9. Moving from your home or hostel to the classroom is an example of -----
motion.
10. The vertical motion of a mass hung from a spiral spring is a type of -----
-motion

Application of planned repetition skill questionnaire (APRSQ)

Dear Respondent

A study is on to find out the influence of planned repetition skill on academic performance of students in secondary school physics in Khana local government area of Rivers State. This study will help a lot in teaching/learning process. Kindly respond as honestly as problem.

Yours faithfully,
Research

The questionnaire is made up of two sections. Section A is on personal data while Section B has 5 tabular sets of questions on the influence of planned repetition skill.

Section A (please tick the appropriate response)

Gender: Male Female

Age: Below 30 years above 30yrs

Teaching experience: Below 10yrs 11-20yrs

21-30yrs above 31yrs

Professional qualification: NCE B.ED MSC and above

Subject taught :-----

Section B

Instructions

Answer the following questions as spontaneously as possible. Tick your preferable option

S/N	questionnaire statement	A (4)	SA (3)	D (2)	SD (1)
1.	Most physics teachers have little or no knowledge of planned repetition				
2	Most physics teachers do not deliberately adopt planned repetition skill				
3	Most teachers are not aware that intermittent repetitions of difficult ideas, definition, concepts in physics lesson will enhance students understanding				
4	Most teachers do not summarize the main points of their lesson at the end of the teaching as massed repetition				
5	Some teachers do not ask students to repeat certain points made by the teacher in the class				
6	Some teachers do not repeat previous facts learnt that relates to the current lesson				

S/N	Statement	A (4)	SA (3)	D (2)	SD (1)
1.	Professional teachers often apply or utilize planned repetition skill while teaching				
2	Planned repetition skill ought to be utilized because it enhances mastery learning among students				
3	The various forms of planned repetition skill should be utilized by teachers while teaching				
4	The use of planned repetition reduces forgetting and enhances remembering of facts				
5	The use of planned repetition should be applied as at when due to achieve the aim of its utilization				
6	Planned repetition should be used by teachers at each lesson delivery				
7	Planned repetition if used will help both quick and slow learners to gain indepth knowledge of the topic taught				

Statement	A (4)	SA (3)	D (2)	SD (1)
1. Timing of 40 minutes duration for each lesson is not enough to apply planned repetition on skills				
2 Its application consumes energy and adequate attention				
3 Lack of regular training, seminar and workshop on the use of planned repetition				
4 Lack of fund to organize training and retraining of teachers on the use of planned repetition				
5 Teachers poor attitude to teaching				
6 Lack of professional teachers				
7 Irregular supervision of teachers				
8 The one planned repetition regularly can breeds monotony and boring learning				

S/N	Statement	A (4)	SA (3)	D (2)	SD (1)
1.	Increase in timing to permit application of planned repetition in class				
2.	The use of planned repetition should be adequately planned to reduce energy consumption				
3.	There should be regular training seminar and workshop on the use of planned repetition				
4.	Adequate of funding to organize training and retraining of teachers on the use of planned repetition				
5.	Professional teachers should be employed as teachers				
6.	There should be regular supervision of teachers to avoid non-chalant attitude among them				

S/N	Statement	A (4)	SA (3)	D (2)	SD (1)
1.	The use of planned repetition skill helps students to participate actively in the lesson				
2.	Application of planning repetition skill enhances remembering among after lesson delivery				
3.	Planned repetition enhances mastery learning among students				
4.	Application of various forms of planned repetition skill will enhance LTM and STM in terms of recalling of facts				
5.	The use of planned repetition skill engenders confidence both on the teacher and students.				
6.	Planned repetition skill helps to capture students attention in a lesson session				
7.	Adequate use of planned repetition reduces forgetting monotony and boring of the lesson				

A. Experimental groups

class Interval	f	x	Fx	(x - \bar{X})	(x - \bar{X}) ²	f(x - \bar{X}) ²
10-12	25	11	275	-3.5	12.25	306.25
13-15	27	14	378	-0.5	0.25	6.75
16-18	17	17	289	2.5	6.25	106.25
19-21	17	20	220	5.5	30.25	605
	80		1162			752

$$\text{Mean, } \bar{X} = \frac{\sum FX}{\sum F} = \frac{1162}{80} \approx 14.50$$

Similarly,

$$\text{Standard Deviation, } SD = \sqrt{\frac{\sum F(X - \bar{X})^2}{\sum F}} = \sqrt{\frac{752}{80}} \approx 3.07$$

B. Control groups

Class Interval	F	x	Fx	(x - \bar{X})	(x - \bar{X}) ²	f(x - \bar{X}) ²
6-8	28	7	196	-3	9	252
9-11	25	10	250	0	0	0
12-14	24	13	312	3	9	216
15-17	03	16	48	6	36	106
	80		806			574

$$\text{Mean, } \bar{X} = \frac{\sum FX}{\sum F} = \frac{806}{80} \approx 10.00$$

and

$$\text{Standard Deviation, } SD = \sqrt{\frac{\sum F(X - \bar{X})^2}{\sum F}} = \sqrt{\frac{574}{80}} \approx 2.67$$

The Z-test Analysis was done using the formular:

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}} = \frac{14.50 - 10.00}{\sqrt{\frac{3.06^2}{80} + \frac{2.67^2}{80}}} = \frac{4.5}{\sqrt{0.11705 + 0.08911}} \approx 9.91$$

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