MASTERY LEARNING STRATEGY: A PANACEA FOR REVITALIZING SECONDARY SCHOOL EDUCATION

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Abstract

The study aimed at investigating whether secondary school teachers use mastery learning strategies (MLS) in teaching and learning. The study x-rayed the theoretical framework of MLS and its effectiveness in acquiring knowledge of subject matter. The study was restricted to SSI Secondary School teachers in Otuocha, Onitsha and Aguata Local Government Areas of Anambra State. Three research questions guided the study. The sample consisted of 300 secondary school teachers. The instrument was questionnaire. Mean and standard deviation (SD) were used to answer the research questions. Based on the findings, recommendations were made.

Introduction

During the 1960s, science education in Nigeria has been under intense public criticism: criticism in the area of low enrolment in science, poor performance in science, unqualified science teachers, inadequate instructional and infrastructural facilities, poor quality teaching, low morale of teachers and lack of students' interest (Ifeakor, 2006). The need for effective science teaching and learning in our schools as sure means of achieving the much needed technological break-through in the country is widely recognized and accepted by all. It is however disheartening to observe that in" spite of this recognition, performance in science continues to be poor. Research findings have found teaching method among other factors to be responsible for the poor state of science achievement (Akinsola, 2004; Ifeakor, 2006). Teaching strategies have possible link with achievement in general-Bearing this in mind, it behoves on science teachers, science educators and curriculum planners to-device teaching methods among other factors, as the centre piece of improving educational outcomes, reversing, refocusing, revitalizing and reforming the current negative trend in science achievement and other educational outcomes through instructional strategies and practices. This underscores the need for this study.

As a nation we are moving from the agricultural age to the information age. Changes are taking place rapidly in the economic arena due to advances in technology. However, similar changes have yet to be made in education. Gallagher and Pearson (1989), reviewed several studies on classroom practices and reported that from 1893 to 1979, instructional practice remained about the same. Robinson (1992), states that student characteristics as well as societal expectations have changed, while traditional methods and modes of instruct are still employed by a large number of educators.- This is leading to a growing concern that Nigerian schools are unable to educate the youths and therefore non-traditional methods and modes of instruction must be evaluated. This paper addresses one of such method of instruction: mastery learning.

The conceptual paradigm of mastery learning grew out of research in human learning by B. F. Skinner (1954). Skinner (1954), contended that the learning of any behaviour, no matter how complex, rested upon the learning of a sequence of less complex component behaviours. Theoretically, therefore, by breaking a complex behaviour into a chain of component behaviours and by ensuring student mastery of each link in the chain, it would be possible for any student to master even the most complex skills. Mastery of each link in a chain is based on the Skinnerian principle, which says: "behaviour is a function of its consequences".

Bloom (1968), is now generally recognized as the classic theoretical formulation on the mastery model. He is widely viewed as the major theoretician and promulgate!" of mastery learning. Bloom made a number of specific predictions about the gains from mastery learning procedures. These gains will help to refocus and revitalise education in secondary schools. One of such is that in classes taught for mastery, 95% of the students will achieve at the level previously reached by the top 5%. Secondly, he argued that although students taught for mastery may need more time to reach proficiency in the initial stages of a course, they should need less time to master more advanced materials because of the firm grasp of fundamentals that they should gain from their initial efforts. It was maintained that besides mastery of the material to be learned, mastery learning increases the attitude and interest of students. It was suggested that mastery-learning procedures are likely to enhance learning outcomes in almost all subject areas. However, Guskey and Gates (1986) suggested that effects were largely seen in Mathematics and Sciences since learning in these subject areas is generally

more highly ordered and sequential.

A work done by Ituen (2004) stated the advantages of mastery learning as follow:

i. The performance of an average student in the mastery learning programme is better than that of 80 to 85 percent of the students in non-mastery classes.
ii. Mastery learning results in greater retention of what is learned.
in. Students enrolled in mastery learning programmes learn to learn more efficiently than others.
iv. Mastery learning students display more positive attitude to the subject studied.
v. Mastery learning processes help to prepare students for independent research.

Ituen (2004) identified one problem associated with mastery learning, which is that it is lime consuming for the teacher.

The gap that has been created in our secondary education system lies on grades. Students are much after the grades they get in both internal and external examinations. Teachers want to cover their syllabus whether the students understand or not; students want to get high grades whether they are attending classes or riot. Our society celebrates success no matter the means, and so our students want to identify with success without any serious input or hard work (Olele 2005). She noted that grades set students against themselves and the society at large. The emphasis should be on helping students to learn, instead of acquiring grades that they cannot defend by way of application. There are some variables in secondary school system that can be altered gradually for quality education. Mastery learning/time-on-task is one of such.

Furthermore, Olele (2005), stated that, many students today cannot write internal and external examinations without cheating at all levels of the educational system in Nigeria. The alarming rate of this practice is a nagging problem. The seriousness lies in the fact that parents, as well as "teachers, are all involved in one way or the other. Examination is very necessary[7] in formal school system because achievements have to be graded, to assess the level of academic proficiency of the students towards the achievement of the educational goals. To buttress the problem of examination malpractice in our secondary schools, about eleven (11) secondary schools in Anambra State and Onitsha in particular were derecognised as centres for public examinations from January 2007 to December 2010. (Vanguard, March 1, 2007). A practical solution to this problem in schools could be for students and teachers to work co-operatively towards the acquisition of knowledge, skills and desirable altitudes. This seems to be the only possible way of reaching the level of mastery of contents, concepts, ideas and skills.

> What mastery learning model advocates is that learners with different aptitudes should be provided different time to study the same unit. While some will require less time, others will require a longer time. When each learner is provided his ideal time for learning based on his aptitude, the same degree of mastery will be attained. In his "model of school learning", Carroll (1963) was of the view that the degree of learning is a function of the actual time needed for learning and the time actually spent in learning.
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> $$\text{Degree of learning} = \frac{\text{(Time Actually Spent)}}{\text{(Time Needed)}}$$

When students with different aptitudes are subjected to the same learning tasks under the same time, a normal distribution curve will follow. When a learner is allowed enough time based on his/her aptitude, the failure rate may be as low as 5%. One of the processes of Universal Bnsic Education (UBE) is to carry all students along irrespective of his/her aptitude until mastery is achieved. Other important variables that determine the degree of learning include perseverance, quality of instruction and ability to understand instruction.

In order to achieve the foregoing, Bloom (1968), cited in Dike (2006), advocated that the trick lies in defining mastery (competency), in providing time and improving the quality of instruction needed. He went further, to put forward the steps needed in mastery learning as follow:

1. Formal specification of cognitive objectives
2. Division of course content (and objectives) into instructional units
3. Formative/diagnostic evaluation
4. Corrective or remedial instruction
5. Criterion - referenced summative evaluation.

The National Policy on Education (Fed. Rep. Of Nigeria, 2004), states that the broad goals of secondary education shall be to prepare the individual for (a) useful living within the society, and (b) higher education.

In specific terms the National Policy document on Education states that secondary education will do the following, inter alia:

a) Provide for differences in talents and prepare students for future roles
b) Inspiration of students with a desire for self-improvement and achievement of excellence.

It is worthy of note that our secondary school students end up their secondary education in so called "study centres where they say things happen". Why is it so? This is partly because they are not well informed of their subject matters. Teaching had always been the usual "talk and chalk" method. Students are not involved in meaningful activities that will make them understand meaningful and in-depth studies of the concepts, theories ideas and skills for useful living within the society and for higher education.

To achieve all these goals and refocus, reposition and revitalize the beneficiaries of secondary education from the cankerworm of cheating in internal and external examination, have a desire for self-improvement and achievement of excellence, mastery teaching and mastery learning would be employed. This is the major objective for this research work.

Purpose ofthe Study

The purpose of this study was to ascertain whether secondary school teachers teach for mastery learning. Specifically, this study sought to:

1. Find out whether secondary school teachers teach the student mastery learning.
2. Find out whether there is availability of instructional materials for practical activities.
3. To identify barriers to mastery learning strategies in secondary schools.

Research Questions

1. To what extent do secondary school teachers teach their students for mastery learning?
2. To what extent are instructional materials available in secondary schools for practical activities?
3. What are the barriers that affect mastery learning strategies in secondary schools?

Methodology

Design: The design was a descriptive survey.

Area of Study: This study was conducted in Anambra State specifically in Otuocha, Onitsha and Aguata education Zones. There are 28 secondary schools in Otuocha education zone, 32 secondary schools in Onitsha education zone and 64 secondary school in Aguata education zone.

Population of the Study

The target population comprised all the 1,030 SS I secondary school teachers in Otuocha, Onitsha and Aguata education zones.

Sample and Sampling Techniques

The research sample comprised 300 SS I teachers randomly drawn from 30 secondary schools selected from the area of study.

Instrument for Data Collection

The researchers developed a questionnaire to be answered by the teachers. The questionnaire was face-validated by two science education lecturers and one measurement and evaluation expert. The reliability was determined using Cronbach alpha method. The questionnaire was given to 20 SS 1 teachers who were not included in the study. The computation gave an internal consistency of 0.74.

The instrument was structured to elicit responses based on Strongly Agree (SA) = 4, Agree (A) - 3, Disagree (D) = 2, Strongly Disagree (SD) = 1.

Administration of Instrument/Data Collection

The researchers administered the questionnaires by themselves and collected them on the spot. A total of 294 questionnaires were collected from the teacher.

Method of Data Analysis

The research questions were answered using mean and standard deviation (SD). The mean of 2.50 and above is accepted while mean scores below 2.50 is regretted.

Result s

The results of the findings were presented in Tables 1, 2, 3. **Table I: Mean and Standard Deviation** (SO) **of Teachers teaching for Mastery Learning**

	Mastery Learning Strategics	X	SD
1	Specify the instructional objectives ~	2.85	1.10
2	Break down objectives into sub-units	2.62	0.61
3	Sequentially arrange the sub-units	1.89	0.94
4	Construct formative evaluation	2.10	0.71
5	Prepare alternative learning materials	1.50	0.76
6	Teaches the first unit in the sequence	2.00	0.81
7	Administer formative evaluation	1.10	1.00
8	Non-achievers are given extra time to master the unit	1.80	0.91
9	The time allotted for a topic is adequate to attain mastery of the topic	1.65	0.84
10	The teacher administers summativc evaluation	3.00	1.05

Items 1, 2 and 10 reached the approved mean of 2.50 and above. This showed that Ihe. teachers plan their work but do not teach to mastery learning before giving the summative evaluation.

Table 2: JVIean and SD of Available Materials for Mastery learning

	Availability of Instructional Materials	X	SD
1	Computer	1.25	0.81
2	Computer appliances	1.73	0.75
3	Laboratories	2.25	1.07
4	Laboratory equipment	1.96	0.69
5	Charts, Models, pictures	2.10	0.68
6 .	Over head projectors	1.50	0.32
7	Slides and transparencies	1IO	0.83
8	Microscopes	2.38	1.21
9	Chemicals (heavy and fine)	2.00	0.84

From Table 2, one can see that laboratories (2.25) microscopes (2.38), chants, models, pictures (2.10) and chemicals (2.00) has a mean rating nearing 2.50. They were available but the quantity did not reach 2.50 average. The other materials like computers (1.25), computer appliances (1.73) etc were handfuls in the secondary schools. This shows that there is little availability of instructional materials for the leaching for mastery learning.

Table 3: Mean and SD of Barriers to Mastcrv **learning Strategies**

	Barriers to MLS	X	SD
1	School administrative barriers	2.96	0.68
2	Parents/Guardians barriers	2.79	0.81
3	Lack of cooperation of teachers and students	3.00	1.09
4	Large class size	3.00	1.10
5	Too many scripts to mark hence no formative evaluation	2.86	0.86
6	No group-based or individualized instruction	1.91	0.76
7	No feedback from teachers	2.65	0.69
8	Barrier from household responsibilities	3.50	1.25
9	Time factor barriers	2.54	0.96

School administration, (2.96) parents/guardian, (2.79) lack of cooperation of teacher and students (3.00) large class size (3.00), no formative evaluation (2.86), etc constitute barriers for mastery learning strategy.

Discussion

From the results of this study generally, mastery- learn ing strategies are not practiced in secondary schools. This is the reason why students achievement in educational outcomes have been consistently poor. This also lead students; to cheating in examinations because they have not

means of MLS need not he over-emphasi/cd. Super, quoiing Olck' t^ouS), opined HUH Ml> K me only way out of the present educational problems in uur secondary Schools. Despite this, Nigeria is yet to meet with the technological growth of the millennium.

Moreso, secondary school teachers are faced with barriers from school administrators, parents, students and communities. Some school administrators are not cooperative at all. They put everything that comes in and out of the school in their pockets. In the past, many contributions had been collected from students with the sole aim of purchasing instructional facilities for effective teaching and learning. But nothing ever comes out of such exercises. All such monies collected disappeared into thin air and no one was ever queried for the anomaly.

On the part of parents/guardians, they are very much after the grades of their wards/children at the end, of the session without asking how they acquired the learning. They never care to support the school with any materials needed for classroom activities. More so, they are not ready to spare at least thirty (30) minutes extra after school for remedial classes.

The communities as a whole expect cordial community/school relationship. They expect the schools in their area to have a very high tone in all aspects of school life. Much is expected from school teachers yet they are not given any incentive or motivation.

Recommendations

Based on the findings, the following recommendations were made:

1. Secondary school teachers should be equipped with all that is needed to make MLS functional.
2. School administrators should take the role of instructional leaders. Instructional leadership involves an understanding of mastery learning principles, a commitment to preparing and supporting staff, constant awareness, and a system for setting and monitoring goals, directions, and results of the programme.
3. Parents/Guardians should give students time to study at home and also help them academically when need be.
4. Ministry of Education should employ more secondary school teachers to reduce the large class size to a ratio of 35 students to 1 teacher.

Secondary schools should be funded adequately to help equip schools with instructional materials. This can come in form of grants from government, Non-Governmental Organizations (NGOs) and philantropists.

Conclusion

Mastery learning, as an instructional strategy for revitalizing education, has improved upon the factors under the teachers control such as students' opportunity to learn and the quality of instruction. Mastery learning has been shown to favour retention, transfer of learning, students' attitude towards themselves and towards the subject matter studied. Finally, MLS when fully adopted, our secondary school system will be refocused and meet the global challenges of time.

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