EFFICACY OF ENRICHMENT TRIAD AND SELF-DIRECT MODELS ON ACADEMIC ACHIEVEMENT OF GIFTED STUDENTS IN SELECTED SECONDARY SCHOOLS IN NIGERIA

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Questions about gifted learners and the best way to teach them to face expected challenges is often a source of controversy. This is because old stereotype curriculum and conventional instructional strategies may not be enough to give the needed stimulation. Considering the enormity of what is expected to reinforce the education of the gifted, this study investigated the efficacy of Enrichment Triad and Self-Directed learning models on the academic achievement of selected gifted students in some secondary schools in Nigeria. The study used the pre-test, post-test, control group quasi-experiment design in a 3 x 2 factorial matrix. The subjects for the study consisted of 75 Senior Secondary School gifted students from eight secondary schools in Nigeria. Multi-stage sampling technique was utilized for the selection of the participants, which were randomly assigned into three experimental groups. Analysis of Covariance was the main statistical method utilized to test two generated hypotheses at the probability level of 0.05. The findings revealed that there was significant treatment effect on subjects' post-test academic achievement scores. There was no significant main effect of gender. The study also indicated that gifted male subjects exposed to Enrichment Trial and Self-Directed models had higher mean score (x = 80.93) than their female counterparts exposed to the same treatment. Since the Enrichment Triad and Self-Directed models are capable of facilitating gifted students' educational programmes, it is therefore recommended that both regular and special educators should use these models in facilitating the academic achievement for their gifted students.

Gifted and talented individuals do not face challenges in the same way that most children who receive special education services do. However, because of their differences (high levels of intelligence, academic achievement, creativity or unique talents); they are often stifled by educational approaches that do not challenge or develop their cognitive abilities or help them achieve to their potential. For these reasons many parents, policymakers and education professionals, believe that these students need special services (Grantham, 2002).

Schools across the world have been adding more teaching learning models for students of all ages and abilities. Gifted and talented students in many schools, now use various teaching learning models in their classrooms and increasingly large percentage of these students have developed their intellectual functioning through the use of these models. Educators, captains of business and industry, government, and the general public, believe that students must be facilitated through the various teaching learning models for a developed intellectual functioning. The disparity between theory and practice is attributed to many causes, ranging from a lack of educational focus, to shortage of funding. Even those problems have found evidence that students are working *smarter*, whether they are learning and using more information, understanding better, or developing higher level thinking skill (Holden, 1998). Thus, gifted students are now benefiting from increased use of various teaching learning because their special needs are being met through informed used of these various models (Jones, 1990).

According to Maker (1995) the determination of the specific needs of gifted and talented children is complicated by the widely different opinions of what giftedness is and how it is manifested. Basic research is as varied as Gardner's (1983) theory of multiple intelligences and Renzulli's (1994) congruence between ability, commitment and creativity. Most agree, however, that the talents of gifted youngsters are dynamic, rather than static or fixed, and the youngsters and their talent must be nurtured. How schools nurture the gifted through the use of teaching learning models like enrichment triad and self-directed models and its effect on their academic achievement is the focus of this research.

A teaching learning model therefore, is a structural framework that serves as a guide for developing specific educational activities and environments. A model can be highly theoretical and abstract, or it can be a more practical structural framework. Regardless of whatever it is, theoretical or practical, the distinguishing features common on learning models are implicit assumptions about the characteristics of learners and about the teaching learning process. These include guidelines for developing specific day-to-day learning experiences; definite patterns and requirements for these learning activities and a body of research surrounding their developments or an evaluation of their effectiveness (Maker, 1994).

Joyce and Weil (1999) have identified more that (80) teaching learning models and have divided them into four families based on their common viewpoints about teaching and learning. The first group, social interaction models, emphasizes the relationship of the individual to the society and to other groups, and focuses on the individual ability to relate to others, engage in democracy, and work productivity with society. The third family, personal models, shares an orientation toward the development of self-concept. Behaviour modification and cybernetic models emphasized changes in observable behaviour based on efficient sequencing of learning tasks along with manipulation of antecedents and consequences.

The Enrichment Triad Model
The Enrichment Triad Model was developed as a total enrichment skills, and development of an investigative attitude. Several teaching learning models have been developed for education and used in programmes for the gifted, but few have been developed specifically for teaching gifted children. One of the most popular is Renzulli's(1994) Enrichment Triad. Educators of the gifted and critics of special provisions for the gifted have long been concerned about providing *qualitatively different*. Learning experiences for these children; therefore, Renzulli presents an enrichment model that can be used as guide in developing defensible programmes for the gifted, this is programmes that are qualitatively different.

According to Renzulli (1994) qualitatively different programmes mean more than freedom of choice, lack of pressure, absence of grading, an individualization of rate or pace, although all of those are important in gifted programmes. Renzulli developed a model for moving the student through awareness, the learning of process, and the development of a product using three different but interrelated types of learning activities. The simplest form of enrichment sometimes referred to as vertical enrichment or acceleration, consists of introducing gifted students to advance courses early. This practice takes care of the student's need to be challenged and to interact with equally advanced peers and more specialized instructor enrichment activities that must be respected; the student's content interest and preferred style these are important components of Renzulli's model. There are two main objectives that Renzulli (1994) recommends for guiding the education of gifted and talented students and that are incorporate into Triad Approach:

1) Students will have an opportunity to pursue their own interests to whatever depth and extent they so desire; and they will be allowed to pursue these interests in a manner that is consistent with their own preferred styles of learning.

2) The primary role of each teacher in the programme for gifted and talented students is to guide students to identify problems that are consistent with the student's interest.

In addition, another role of each teacher is to acquire the necessary methodological resources and investigative skills that are necessary for solving these particular problems. The skills will help the teachers to cope with various problems that may want to impede the success of gifted students.

Renzulli (1994) further noted that enrichment activities consist of three types and these activities are prepared in such a way that each type provides springboard for the other (i.e. type one, two and three) and are interrelated.

Type one focuses on three procedures that teachers can use to allow the student to explore a diversity of areas, which are interest centers, visitation or field trips, and resource persons or guest speakers (Renzulli, 1991). These activities create awareness for the gifted and talented students which later arouses their interests.

Type two provides valuable systems for organizing thinking and feeling processes and factors that are essential for human learning. These processes are necessary for type three because they are the basic skills that serve as foundation for type three. Students must then acquire the process skills and abilities that will enable them to solve problems in a variety of areas. The following are given by Renzulli and Reis (1993) as example of process skills. That is, brainstorming will lead to comparison and comparison will lead to elaboration, observation will lead to categorization and from categorization to hypothesizing, classification to synthesis and synthesis to awareness, interpretation leads to fluency and fluency to appreciation, analysis leads to flexibility and to value classification and evaluation leads to originality and originality to commitment.

In this model, the teachers' role is to be a manager in the learning process and to know when and how to enter into this process.   The teacher thus has the following major responsibilities when managing type three. These include: identifying and focusing students' interest findings appropriate outlets for students' products providing students with methodological assistance and developing a laboratory environment (Reinzulli & Reis, 1993).

Self-Directed Model
In addition, one of the important priorities expressed by educators of the gifted is a need to develop self-directedness or independent learning skills in students so that they can continue their learning without constant supervision or assistance from an adult. Often, these educators, along with the parents of gifted children, assume that because their children are gifted, they automatically are or will become if turned loose - self-directed learners. Indeed gifted children are more independent than other children. However, not all gifted children are independent learners, and even if they are more independent than other children they probably do not possess the skills that will enable them to direct their own learning completely or conduct their own research, unless they have had some practice of being self-directed (Maker, 1994).

Treffinger's (1996) model provides exactly the structure needed to developed gradually in students the skills necessary to become self-directed learners. It is a model designed for moving students towards independent learning. Its primary goal is the sequential development of skills in managing individual learning, which builds on the strengths of gifted children, enhances their involvement in their own learning and increase their motivation by allowing them to study in their areas of interest.

The self-directed learning model developed two assumptions about learning, first, children will learn better if involved in their own learning. Second, they will be more motivated to learn if they directed their learning in areas of their own choice. These assumptions are closely related to Bruner's (1994) and Kagan's (1993) ideas about discovery learning. When children are active rather than passive participants in the learning process, they learn more, remember it longer, and develop more self-confidence in their ability to figure things out on their own. This contributes to greater motivation for learning rather than doing what they are told by an adult.

The self-directed learning model provides a structured way for teachers to develop experiences that will move their students and themselves toward student-directed learning. Rather than assuming that gifted students already posses the self-management skills that will enable them to be independent learners, the model provides a way to develop these skills gradually. In this process, both teacher and student roles change drastically as students assume more responsibility. The teacher moves from director to a provider of options, and then to resource person or facilitator when needed by the student. On the other hand, the student moves from passive/learner to a developer and chooser of options, and then to diagnostician, director of learning and self-evaluator (Barton, 1994).

Furthermore, Treffinger (1988) presented the idea underlying self-directed model as the teaching that involves the following four basic factors that can be used to analyze any instructional event or sequence. These include: identification of goals and objectives, assessment of entering behaviour identification and implication of instructional procedures and assessment of performance. In most

classrooms, all these factors are completely under the direction and control of the teacher. The teacher decides what the class as a whole will learn.

Statement of the Problem
Most gifted students are not adequately exposed to educational approaches that would challenge or develop their cognitive abilities. Questions about gifted learners and the best way to teach them to face expected challenges are often sources of controversy.

Gifted students manifest or are capable of developing opportunities and services that are not ordinarily provided through regular or traditional instructional programmes. This is because old stereotype curriculum and conventional instructional strategies may not be enough to give the needed stimulation, especially in Nigerian schools.

Considering the challenges faced by the gifted in Nigeria schools and the inability to identify their academic needs, this study therefore investigated the Efficacy of Enrichment Triad and Self-Directed learning models on the academic achievement of selected students in some secondary schools in Oyo State, Nigeria. Thus the outcome of this study will serve as the basis upon which educational programmes for the gifted can be better achieved considering the growing trend in the education of this identified group. This will therefore lay to rest the controversies surrounding the causes of under-achieving among gifted children.

Method
Participants
A total of 75 identified gifted students were selected from a target group of about 600 from all the eight secondary schools that were randomly selected for the study. These schools comprised both private and public secondary schools in Oyo State, Nigeria. Their IQ level ranges, between 129 and 136 for ages 12 to 16 with the use of Slosson intelligence test, Teacher made achievement test and metropolitan Achievement test (adapted from George, A.P. et' al (1978) Metropolitan Achievement Tests)

Design
The researcher adopted a pre-tests; post-test, control group, quasi-experimental design, with a 3 x 2 (three by two) factorial matrix which covers the instructional strategies. Two null hypotheses were tested in the study. These are:
   (a)   There is no significant difference in the academic achievement of gifted students exposed to Enrichment Triad, Self-directed model and control group.
   (b)   There are is no significant difference in the academic achievement of male and female gifted students exposed to Enrichment Triad, self-directed learning and control group.

The design employed the use of the 3x2 factorial matrix, which consisted of the following variables: These are: One independent variable (instructional strategy) at the three levels i.e. Enrichment Triad Learning model, Self-Directed model and Conventional method for the controlled group. One moderating variable consists of male and female (gender) and one dependent variable, which is the academic achievement of the participants.

Procedure and Instrument
The participants went through 13 weeks of different sessions of English language and Mathematics through the instructional methods of Enrichment Triad and Self-Directed models as a treatment package. Each of the lessons was based on the types and stages of the models respectively. The study made use of three instruments, one for purpose of identification and the remaining two as pre-test and post-test achievement tests. Slosson's Intelligence Test (SIT) was used to identify and provide information on IQ level. The Metropolitan Achievement Test (Advance II) and West African School Certificate Achievement Test (WASCAT) were used to test the achievement of the students in Mathematics and English Language with the total scale of the SIT having an alpha coefficient of 0.97; MAT with 0.98 and WASCAT with 0.87.

Analysis of Data
The inferential statistics of ANCOVA (Analysis of Covariance) was used to test the stated null hypotheses at 0.05 level of significance. Also, the Multiple Classification Analysis (MCA) was used to determine the magnitude of the performance of the various groups, t-test, using the least meant squares

(LMS) and Standard Error of the mean (SEX) was employed to determine the influence of the two learning models on the academic achievement.

Results
There was no significant difference in the academic achievement of gifted students exposed to Enrichment Triad, Self-Directed model and control group. From hypothesis one, it was evident as shown in table one below, the effect of treatment on the post-test scores of subjects was significant (F 3.56 = 495.498, p<0.05). This shows that there was a significant difference in the academic achievement of gifted students exposed to Enrichment Triad, Self-Directed model and Control Group. On the basis of this finding, the null hypothesis one was rejected. In order to determine the magnitude of the mean achievement scores of subjects in each of the two treatments, and control groups, the multiple classification analysis was used as shown in table two.

Hypothesis two indicated no significant difference in the academic achievement of male and female gifted student exposed to the two treatments and control group. It is worthy noting that gender had no significant effect on participants post-test achievement scores of male gifted students in better (x=80.83) than their female counterparts (x = 79.33) this difference, is however, not significant.

Table 1
Summary of Analysis of Covariance of Post-Test Scores of Subjects According to Treatment and Gender

Sources of Variance	Sum of Square(s)	df	Mean Square	F	Sig
Covariance Pre-test	124.959	1	124.959	8,420	0.005
Main Effects (combined)	22158.90	5	4431.780	298,612	0.005
Treatment	22061.47	3	7353.823	495,498	0.005*
Gender	39.600	1	39.6000	2,668	0.108
2-way Interaction (combined)	64.170	7	9.167	0,618	0.739
Treatment* x Gender	28.348	3	9.449	0,637	0.594
Model	22405.79	16	1400.362	94,356	0.005
Residual	860.795	58	14.841		
Total	**23266.59**	**74**	**314.413**		

* Sig (Significance), * Significant at p<0.05

Table 2
Multiple Classification Analysis of Post-Test Scores by Treatment and Gender

Variable + Category	N	Unadjusted Deviation	ETA	Adjusted for factor and Covariance Deviation	BETA
Treatment 1.00 Enrichment Triad	28	10.5089		10.26	
2.00 Self-Directed	27	9.8455	0.976	10.09	
3.00 Control	20	-23.5133		-28.54	
Gender 1.00 Male	44	-0.5542	0.037	0.62	0.042
2.00 Female	31	0.7867		-0.88	
MULTIPLE R = 0.979					
R SQUARE = 0.978					

Discussion
The most obvious finding from this study was that the two treatments (Enrichment Triad and Self-Directed learning) were very important instructional strategies toward improving the academic achievements of gifted students in Nigeria, and these were more adequate instructional strategies for the gifted compared to conventional methods that seemed non challenging to the gifted students. This was confirmed in the findings from Hulick & Chuck (1998) that self-directed learning had a great influence on the academic achievement of the participants in the studies. Similarly, Collins, Norma,

Alex and Korten (1995) examined two research studies related to enrichment triad and self-directed learning models, which encourage problem finding and problem solving in gifted education. In support of the justification of the best option of teaching learning models as it was discovered in this study, they confirmed that academic achievement, creative problem solving and enrichment triad were complimentary in that they enhanced students to develop the abilities comprehensively.

Again, the findings were in line with Okoro (1991) on effect of enrichment triad and self-directed model on reading of high achieving student. His findings indicated that the mean score of the experimental group was (x = 71.25), while that of the control group mean score was 60.25. This showed a significant difference between the enriched and the non-enriched group. Thus, special educators and educators generally must come to understand their potential role, especially in inhibiting creativity, divergent thinking, and intellectual and academic achievement in gifted children. This could be achieved through the implementation of some of the teaching learning models (enrichment triad and self-directed learning models).

It is highly unlikely that the conventional or the traditional methods of teaching the gifted that are currently being used in Nigerian schools could provide the necessary challenges needed for these children. Therefore, this study focused on the efficacy of enrichment triad and self-directed learning model for enhancing academic performance of the gifted children. Having considered the various concepts of giftedness in relation to teaching learning activities through the use of Enrichment Triad by Joseph Renzulli, (1994) and self-directed model by Donald Treffinger, (1996), the researcher concluded that, the most effective teaching strategies to be employed should be the combination of the various models to form a comprehensive approach.

In addition, Renzulli's (1994) Enrichment Triad was basically designed as a framework for programme and curriculum development for the gifted students. Renzulli, for example, recommended that certain process models modification be used to develop his type two activities. He therefore suggested the combination of enrichment activities with other models such as Bloom and Krathewohl's Cognitive and Affective Taxonomies, Parne's Creative Problem Solving; Guilford's Structure of Intellect; Taylor's Multiple Talent Approach; and Kphlberg's Discussions of Moral Dilemmas. This he believes will lead to great success in the education of gifted and talented students.

Furthermore, Treffinger's (1996) Self-Directed Model was designed to provide guidelines for teachers to use in developing an environment where self-directed learning can occur. Since self-Direction is a goal of many gifted, this model if creatively used to train gifted children will in no small measure help them to achieve their potentials fully. This model can also be combined with a content model such as Burnner's Basic Structure of Discipline or Taba's Teaching Strategies with several process models that systematically develop higher levels of thinking (Maker, 1994).

So with the careful application of this teaching model, it is hoped that classroom problems confronting the gifted students will be alleviated. Educators, especially teachers of the gifted in general must come to understand their potential role in enhancing creativity, divergent thinking, intellectual and academic achievement in gifted children, through the application of some teaching learning models (enrichment triad and self-directed leaning). This is because the conventional or the traditional method of teaching the gifted currently being used in gifted programmes cannot really bring out the potentials in gifted students. Therefore, this study concludes by advocating for the use of enrichment triad and self-directed models to enhance the academic performance of identified gifted children in Nigeria.

References
Barton, B (1994) *Toward the development of a self-directed learner: A pilot study* Unpublished Master Thesis, University of Kansas.
Brunner, J. S. (1994) The basic structure of discipline model. In J. Maker (Eds.), *Teaching model in education of the gifted.* Rockville, MD: ASPEN.
Collins, N. D; Alex, O and Kortren, N. (1995). *Gifted readers and reading instruction.* Office of educational research and improvement (Ed) Washington, D. C.
Gardner, H. (1983) Creating minds. New York: Basic books. *Gifted child today, 9*(4), 42-45.
George, A. P. et'al (1978) *Metropolitan achievement tests. Complete survey battery U.S.A.* The psychological corporation. A subsidiary of Harcourt Brace Jovavich Inc.
Grantham, T. C (2002). *Under representation in high achieving education: How did we get here and what needs to change?* (Reoper review), 24, 50-51.

Holden, K. (1998) *Education of the gifted and talented*. Englewood Cliffs, New Jersey: Prentice-Hall.

Hulick, P. & Chuck, T. (1998). *Gifted education model programmes*. Frankfort, Kentucky State Department of Education.

Jones, P. M. (1990) Psychosocial development in intellectually gifted children. In E.D Horowitz and M. O'Brien (eds). *The gifted and talented: Developmental perspectives* (149 - 195) Washington, DC

Joyce, B & Well, B. (1999) *Models of teaching*. Englewood Cliffs: Prentice Hall, Inc.

Maker, C. J. (1994) *Teaching models in education of the gifted*. Rockville, M.D., Aspen Press Ltd.

Okoro, C. J (1991) *The Effect of reading enrichment on achievement level of high achieving students in Nigeria,* Unpublished B. Ed Thesis, University of Ibadan, Oyo State, Nigeria.

Reis, S (1993) Reflections and policy affecting the education of gifted and talented students: Past and future perspectives. *American Psychologist,* 44, 329 - 408.

Renzulli, J. S (1994) *Schools for talent development: A practice plan for total school improvement*. Reston, V. A: *Council for Exceptional Children*, 48, 12 - 33.

Renzulli, J. S (1991) Will the gifted child movements be alive as well in 1990? *Gifted Child Quarterly, 24*, 93 - 97.

Renzulli, J. S & Reis, S. L (1993) *The revolving door identification model* Mansfield Centre, C. T: Creative learning press.

Slosson, R. L (1991) *Slosson intelligence test and manual (SIT - R) for children and adults*. Aurora, Slosson Educational Incorporated.

Treffinger, D. J (1996) Teaching for self-directed learning. A priority for the Gifted and talented. *The Gifted Child Quarterly* 19, 46 – 59.

Treffinger, D (1988) Guidelines for encouragement of independence and self-directed studies among gifted students. *Journal of Creative Behaviour,* 12, 14-19.