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Research Article

Discriminant Analysis of Psycho-Social Predictors of Mathematics Achievement of Gifted Students in Nigeria

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Abstract

The disturbing issue of mathematics underachievement among gifted students seems more like a mystery than a reality and therefore calls for urgent intervention. This is why this study was motivated to investigate the psycho-social predictors that are reliable in discriminating potential achievers and underachieving gifted students in Mathematics. The study is a causal comparative study of 154 gifted SSII students purposively selected through multi-stage screening form 15 secondary schools in Calabar education zone, Cross River State, Nigeria. The discriminant analysis was used to answer the four research questions set to guide the study. There were three main instruments used in the study; the adapted Slosson Intelligence Test Revised (SIT-R r= 0.89) edition, Psycho-Social Scale for Adolescent (PSSA; r=.72, .69, .76, .78, .68, .73 and .73 for the sub-scales) and mathematics Achievement Test (MAT; r=.78).The result of the data analysis revealed that selected psycho-social variables: mathematics self-efficacy, mathematics interest, mathematics task commitment, peer influence, parental influence and mathematics career aspiration) significantly and reliably predict and classify gifted students into mathematics potential achievers and underachievers with the exception of the students' general intelligence. The findings show that there are more gifted mathematics underachievers (N= 82; 53.3%) than gifted potential mathematics achievers (N= 72; 46.7%). It also shows that 100% of the gifted underachievers and potential achievers were perfectly classified.

Keywords:

discriminant analysis, gifted student, mathematics achievement, potential gifted achievers, gifted underachievers

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Introduction

The dwindling performance in mathematics in SSCE revealed by WAEC and NECO among secondary school students in Nigeria is a major source of worry to many concern educator and parents. This problem can be persistent even with gifted students especially among those not identified. Meanwhile, achievement in Mathematics among gifted students has a serious implication on the nation's development and has been a source of worry to most parents, teachers, school administrators and government. mathematics underachievement among gifted students may seriously jeopardize the aims, objectives and rationale for the gifted education. The main objective of the gifted education as stated in the National Policy on Education (NPE) is to be provided education for the gifted and talented learners at their own pace and ability in the interest of the nation's economic and technological development.

There is no subject so central to both economic and technological development like mathematics because it is the basis of economic and technological advancement. Lazurus (2010) reported that out of a total of 378,018 candidates who sat for the Nov/Dec 2007 WASSCE, only 21,148 candidates passed with credit in Mathematics. These statistics implies that only around 5.6% of the candidates passed Mathematics. She also reported in the media briefing of February 15, 2007 on performance of students in SSCE by WAEC, that out of a total number of 423,578 candidates who sat for the Nov/Dec 2006 WASSCE, 48,966 candidates representing 11.5% obtained credit in Mathematics and English language and four other subjects, and only 19,591 candidates representing 4.63% of this candidates obtained credit in Mathematics.

The result analysis of 2009 May/June WASSCE shows that 356,981 (25.99%) out of a total of 1,373,009 candidates passed English language or Mathematics at credit level. The data shows that only 176,729 (8.5%) are students who passed Mathematics and three other science subjects at credit level. The performance of 2010 May/June WASSCE was not better as only 337,071 (24.94%) passed Mathematics and English language with three other subjects at credit level. The percentage however increased in 2011 to 30.99% in WASSCE but the percentage of students reduced drastically as only 6.9% of the students have credit pass in Mathematics and three science subjects (source: www.leadership.ng/nga).

A report provided on the performance of gifted students in Federal Government Academy (FGA), Suleja, on subject achievement analysis in NECO SSCE June/July 2017, indicated that 95.5% was overall percentage credit pass in Mathematics (Dada & Fagbemi, 2018). One would then wonder why lower pass is recorded among gifted students in mathematics, the percentage notwithstanding. The dwindling performance in mathematics has often been attributed to inability of the students to maximize their potentials. In her comment in a yearly publication from the school, the principal of FGA pointed out that, in Nigeria, we are far behind in the teaching

of science (of which mathematics is major) in secondary schools as compared to other nations of the world including the third world countries (Gifted Touch, 2008). This statement should spur teachers into finding ways of improving the teaching-learning process of science subjects and particularly mathematics which is basis for all other science and technology subjects.

Optimum achievement in mathematics has been viewed to be inhibited among gifted students for many reasons. Broadly speaking, mathematics achievement can be caused by cognitive, social or school factors (Dada, 2014). Some of the reported issues that my fall under the cognitive, social or school factors accounting for poor or high achievement in mathematics includes: intelligence, task commitment peer influence, parental influence, student's interest and so on. Other reasons for poor achievement in mathematics are reported due to the following reasons;

- Some mathematics teachers do not understand mathematics so well that has of course made teaching it mainly a matter of following some textbook and relying on it,
- The teachers' and parents' view of mathematics is that, mathematics is a segmentation calculation rules that can only be memorized,
- The inability of teachers to use appropriate techniques or strategy because of the believe that mathematics is abstract and not lively and that high ability students can cope,
- The authoritative approach of teachers in mathematics class,
- The low self-esteem of some gifted learners particularly the girls towards mathematics,
- The discouragement in class and poor attitude of peers towards mathematics achievement of some gifted students and,
- The believe that gifted students have no problem in understanding mathematics, thus, they do not seem to have reasons for using any specialized instructional strategy (Smith, 2001; Johnson, 2000; Dada, 2013). Thus, this is a serious gap that calls for urgent attention if the objective of developing the nation technologically and economically will be realistic.

The tenet of differentiated instruction for the gifted however supports both equity and teaching principle of standards in mathematics for gifted students (NCTM, 2000). These principles should direct the selection and adaptation of curriculum and Mathematics delivery to meet the interests, abilities, and learning need of gifted students; recognizing their diversity and thereby encourage them to attain their full potential in Mathematics.

The inability to achieve potential in mathematics is termed mathematics underachievement (Dada & Dada, 2014). The manifestation of underachievement in mathematics reflects a difference between what students have potential to learn in mathematics and what they have actually learnt. Underachievement of gifted student may sound paradoxical; nevertheless, gifted students who find the school

system, curriculum and classroom instruction unchallenging may underachieve Reis (1998) suggested that gifted students who are not challenged in school will actually not demonstrate integrity and courage when they choose to do, and may require work that is below their intellectual capacity labelling this phenomenon "dropping out with dignity". She concluded that some students may underachieve as a direct result of an inappropriate and un-motivating learning strategy. Davis and Rimm (1995) maintained that the gifted or talented student who is underachieving represents both society's greatest loss and its greatest potential resource. Such children have the potential for high achievement, and yet are not reaching the levels of attainment that would be expected for individuals of their ability. This lack of attainment often leads in turn to frustration and annoyance in teachers, parents and frustration in the student.

Gallagher (1991) and Rimm (1997) have suggested that the causes of underachievement should be viewed from two perspectives: environmental and personality factors. The environmental factor seems to stem from two problem areas: the school and the student's peer group. An anti-intellectual school or anti-ability school's atmosphere can contribute to underachievement behaviour. Reis and Mc Coach (2000) reported negative peer influence as a major important force blocking gifted students' high achievement. Berndt (1999) also reported gifted students in America to be having decreasing grades as they move from fall to spring, because they want to be at par with their friends. This is evidence that anti-academic peer group adversely influenced achievement; and as a result, gifted students want to hide their gift. Major components of the personality factor that relates to achievement are self-efficacy and motivation (Mc Coach, 2000). Students, who learn to see themselves as failure, eventually begin to place self-imposed limits on what they are capable of doing. Contemporary researchers in gifted underachievers such as Reis (1995) and Whitmore (1987) have confirmed that underachieving gifted students are different from achieving high ability students in expression of low self-efficacy and poor leaning motivation.

Many people, including too many educators believe that a high I.Q score gives an accurate description of a person's capacity or potential in subject areas like Mathematics, but Clark (2008) argued that it is not. Pyryt (1996) posited that one of the advantages of IQ score is to identify students who are underachievers and to predict how well. Gallahan (2001) finds that IQ assessment provides data on students' behaviour, abilities and achievement. He posited that underachievement may result from the mask an IQ score may put on a child as a result of non-recognition of potential ability and lack of appropriate education. IQ score therefore may not reflect the extent of the knowledge or ability of a child in specific area of learning. This study, thus consider it worthy to investigate the relative influence of intelligence on mathematics achievement of high ability.

High intellectual ability of gifted students is as a result of high intelligence quotient (IQ). Despite the high intellectual ability of this set of people, many of them

still underachieve because they perform below their potential. Why do so many gifted students fail to realize their potential in mathematics is a big question this study sought to find out? For years, the underachievement of gifted and talented students has troubled both parents and educators (Dada, Bassey & Usani 2016). Too often, students who show great academic potential fail to perform at a level commensurate with their abilities. Some underachieving students may lack self-efficacy, goal-directedness, or self-regulation skills (Siegle & McCoach, 2001); other low achievers may suffer from either obvious or hidden personalities that do support them in realizing their potentials. Still others may underachieve in response to inappropriate educational conditions or other social influences. It is against this background that this study sought to apply the discriminant analysis to determine if selected psycho-social variables (general intelligence, mathematics self-efficacy, mathematics interest, mathematics task commitment, peer influence, parental influence and mathematics career aspiration) reliably predict and classify gifted students into mathematics potential achievers and underachievers.

Research questions: From the problem of study the following research guided the study.

- Do gifted potential achiever and underachiever in mathematics reliably predicted from the selected psycho-social variables?
- On which selected psycho-social variables are the gifted potential achievers and underachievers significantly discriminated in mathematics Achievement?
- What are the relative contributions of the selected psycho-social variables to differentiating gifted potential achiever and underachievers in mathematics?
- How accurate is the classification of gifted potential achiever and underachiever in mathematics?

Methodology

Research Model

The study adopted the causal comparative design.

Sampling

The target population for the study were all gifted Senior Secondary (SS)II students in Calabar Education Zone of Cross River. The accessible population which was eventually the sample for the study was 154 identified as intellectual gifted SS II students from 15 randomly selected secondary schools in the study area. The selection of the participants was done in a multi-stage identification/screening procedure for giftedness. The first stage was the nomination of the suspected gifted students by the teachers and peers. Names of students that were frequently nominated by the teachers and peers were purposively selected. The second stage involves the ranking of the overall percentage of the academic record of SS II

students from the selected nominated name. A cut off point of 65th percentile was used as a criterion for selection. The names that fall within the 65th percentile and above were selected while those outside the 65th percentile were dropped. The last and the final stage in the selection of the participants involved the measure of the intelligence test. A student who appears in the second screening stage was subjected into intelligent quotient (IQ) test. Students with IQ of 120 and above were finally selected as the participants (gifted students) for the study as the.

Data Collection Tools

There were three main instruments used in the study; the adapted Slosson Intelligence Test Revised (SIT-R) edition (2006), Psycho-Social Scale for Adolescent (PSSA) and Mathematics Achievement Test (MAT). The SIT-R was adapted to avoid cultural bias. The adapted version was revalidated by three experts in test psychology after the instrument was trial tested on 30 students. The test re-test method of determining reliability was used and the correlation coefficient obtained from the trial testing was r= 0.89. The PSSA was researchers constructed instrument with six subscales of Self-Efficacy, Mathematics interest, Mathematics task commitment, peer influence, parental influence and Mathematics career aspiration). Each subscale has 10 items with four response options. Therefore, the responses were sum and produced possible continuous scores between 10 as the minimum and 40 as the maximum on each subscale. The PSSA was also trial tested using test re-test method to establish the reliability. The coefficient of reliability were .72, .69, .76, .78, .68, .73 and .73 for the sub-scales mathematics self-efficacy, mathematics interest, mathematics task commitment, peer influence, parental influence and mathematics career aspiration and the total respectively.

The third instrument used was a validated Mathematics Achievement Test (MAT) was used to determine the participants Mathematics achievement. The MAT contains 100 questions pooled from the past WAEC and NECO questions in two equivalent parts; part A and B with 50 questions in each Part. The MATwas content validated by an experience teacher of Mathematics as well as two measurement evaluation experts. The reliability of MAT was established using Kudar-Richardson 20 to give a reliability of .78 with the facility indices of the items between .4 and .7. After the careful screening and identification of the participants for the study, the MAT part A and B were administered to the students followed at an interval of two weeks. This was done to reduce measurement error and to be sure of the consistence in the participants' achievement. The average of the scores on the two administrations was recorded as the score for each student. The PSSA was administered immediately after the administration of the Part B of MAT. A cut off of 70 from the scores was set to divide the participants into two categories; potential achievers (>=70) and underachievers (<70) in mathematics. These two categories formed the dependent variable of the study. The participants' responses on the PSSA were summed according to the subscale to obtain continuous data for the psycho-

social sub-variables. The data collected was analysed using the discriminant analysis from the Statistical Package for Social Sciences (SPSS). The results of the data analysis are presented according to the research question for easy understanding. The standard method of discriminant analysis was used for the data analysis.

Results

Research Question 1: Do gifted potential achiever and underachiever in mathematics reliably predicted from the selected psycho-social variables?

The descriptive statistics of mean and standard deviation of the predictors of gifted students mathematics achievement is presented in Table 1. Below the table are the frequency and percentage distribution of the study sample which shows that there are more gifted mathematics underachievers (N= 82; 53.3%) than gifted potential mathematics achievers (N= 72; 46.7%) from the study sample. Comparing the mean of the variables (general intelligence, mathematics self-efficacy, mathematics interest, mathematics task commitment, peer influence, parental motivation and career aspiration in mathematics), it very clear that there are means differences among the predictor variables under the categories (gifted underachiever and potential achievers in mathematics) as well as well as the total average mean.

The means of the students' general intelligence were $\bar{X}$=133.00, 130.83 and 131.84 for potential achiever, underachiever and overall total respectively. This result implies that if compared the overall mean of their intelligence score is higher than both group means score in mathematics achievement. In the remark column, the asterisk * denotes that the construct cannot reliably discriminate between the two groups. This result implies that student's intelligence cannot be use to reliably discriminate the gifted potential achievers and underachievers in mathematics.

Considering other constructs of the selected psycho-social variable (mathematics self-efficacy, mathematics interest, mathematics task commitment, peer influence, parental motivation and career aspiration in mathematics), it is however observed that the means of the two groups are reliable to discriminate between the two groups as their means are greater or lower than the overall average mean. The ability of any construct of the psycho-social variable to discriminate the two groups is denoted by double asterisks (**). So, mathematics self-efficacy, mathematics interest, mathematics task commitment, peer influence, parental motivation and career aspiration are all reliable discriminator of gifted potential and underachievers in mathematics.

Table 1.

Descriptive Statistics of Mean and Standard Deviation of Psycho-social Predictors of Gifted Potential Achiever and Underachievers in Mathematics

Psycho-social predictors	Potential achiever in Mathematics		Underachiever in Mathematics		Total		Remark
	$\bar{x}$	Std. Dev.	$\bar{x}$	Std. Dev.	$\bar{x}$	Std. Dev.	
Student general intelligence	133.00	5.350	130.83	8.052	131.84	6.985	*
Mathematics Self-efficacy	32.06	3.722	22.27	2.373	26.84	5.780	**
Mathematics interest	28.78	3.441	21.66	3.278	24.99	4.887	**
Mathematics task commitment	28.03	3.452	21.12	2.015	24.35	4.430	**
Peer influence	25.56	3.867	21.17	2.107	23.22	3.756	**
Parent motivation	30.89	3.028	23.41	3.457	26.91	4.958	**
Career aspiration	30.47	3.108	27.27	5.569	28.77	4.845	**

N for gifted underachiever = 72 (46.7%); N for gifted potential achiever = 82 (53.3%); N for total = 154; *= Not a reliable predictor; **= A reliable predictor

Research Question 2: On which selected psycho-social variables are the gifted potential achievers and underachievers significantly discriminated in mathematics Achievement?

The answer to this research question can be provided by considering the test of equality of group mean. Table 2 show the test of equality of group mean of psycho-social variables obtained from the discriminant analysis. Considering Table 2, at the df= 1, 152 the F-ratios, p-values revealed that Mathematics self-efficacy (F-ratio= 387.674, p=.000), Mathematics interest (F-ratio= 172.630, p=.000), Mathematics task commitment (F-ratio= 236.573, p=.000), peer influence (F-ratio= 78.824, p=.000), parental motivation (F-ratio= 201.073, p=.000) and career aspiration (F-ratio= 18.705, p=.000) all differ significantly in their mean score between gifted potential achievers and underachievers in Mathematics. The only construct that does not differ significantly in their mean score was the students' general intelligence (F-ratio= 3.770, p=.054). The Wilks' Lambda is a multivariate test of significance that shows the difference among the predictor variables. It varies between 0 and 1. If the Wilks' Lambda value is closer, it indicates that the differences are not significant.

Meanwhile group differences must be significant in order to generate a function that will be very accurate to classifying the individuals.

Table 2.

Tests of Equality of Group Means of the Selected Psycho-social Variables

	Wilks' Lambda	F-ratio	p-value
Student's intelligence	.976	3.770	.054
Mathematics self-efficacy	.282	387.674	.000
Mathematics interest	.468	172.630	.000
Mathematics task commitment	.391	236.573	.000
Peer influence	.659	78.824	.000
Parental influence	.431	201.073	.000
Career aspiration in Mathematics	.890	18.705	.000

df1=1, df2= 152

The research question 2 can thus be answered that apart from the students' general intelligence, all other selected psycho-social variables; mathematics self-efficacy, mathematics interest, mathematics task commitment, peer influence, parental motivation and career aspiration are all reliable discriminator of gifted potential and underachievers in mathematics significantly discriminate between gifted potential achievers and underachievers in mathematics

Research Question 3: What are the relative contributions of the psycho-social variables to differentiating gifted potential achiever and underachievers in mathematics?

This research question was comprehensively answered using Tables 3 which revealed the result of the eigen values and Wilks' Lambda and Table 4 which gives the results of the Standard discriminant function coefficients and structure matrix.

Table 3.

Eigenvalues and Wilks' Lambda of the Canonical Discriminant Functions of Secondary School Gifted Potential Achievers and Underachievers in Mathematics

	Eigenvalues			Wilks' Lambda			
Function	Eigenvalue	% of Variance	Canonical Correlation (r)	Wilks' Lambda (λ)	Chi-square (χ^2)	df	p-value.
1	10.505[a]	100.0	.956	.087	362.759	7	.000

a. First 1 canonical discriminant function were used in the analysis

The eigenvalues value 10.505 indicates that the discriminant function of the psycho-social predictors discriminates very well between the gifted potential achievers and the underachievers and the canonical correlation coefficient (r= .956)

indicates that the function is highly related to the two groups (gifted potential and underachiever) in Mathematics. The effect of the size of the function is obtained by squaring the canonical correlation coefficient r= $(.956)^2$ = .923 (92.3%). This implies that 92.3% of the function variance is accounted for by the groups of the Mathematics achievers. The overall Wilks' Lambda was significant at λ= .087, χ^2 (df=7; N= 154) = 362.759 and $p<.05$. The implication of this result is that the function of the psycho-social predictors significantly differentiated between the gifted students who are potential and underachievers in mathematics.

Table 4.

Standardized Canonical Discriminant Function Coefficients and Structure Matrix of the Psycho-social Predictors of Gifted Potential and Underachievers in Mathematics

Standardized canonical discriminant function coefficients		Structure matrix	
Student's Intelligence	.155	Mathematics Self-Efficacy	.493
Mathematics Self-Efficacy	.779	Mathematics Task Commitment	.385
Mathematics Interest	.458	Parental Influence	.355
Mathematics Task Commitment	.601	Mathematics Interest	.329
Peer Influence	.324	Peer Influence	.222
Parental Influence	.484	Career Aspiration in Mathematics	.108
Career Aspiration in Mathematics	-.159	Student's Intelligence	.049

The evaluation of the discriminant function coefficients in table 4 revealed that if the standardized canonical discriminant function coefficients and the structure matrix are considered, mathematics self-efficacy has the highest loading. That is Mathematics self-efficacy has the greatest weight as a predictor in discriminating between potential and underachievers gifted students in mathematics followed by mathematics task commitment, parental influence, mathematics interest, peer influence, career aspiration in mathematics and the least is the students' intelligence. Therefore, the answer to the research question is that all the variables except intelligence significantly contributed to the prediction of the discrimination between gifted students who are potential and underachievers in mathematics with the self-efficacy having the strongest relationship while the least is career aspiration in mathematics.

Research question 4: How accurate is the classification of gifted potential achiever and underachiever in mathematics?

Table 5.

Classification Results of Gifted Potential Achiever and Underachiever in Mathematics?

	Mathematics Achievement	Predicted Group Membership		Total
		Potential Achievers	Underachiever	
Count	Potential Achievers	72	0	72
	Underachiever	0	82	82
%	Potential Achievers	100.0	.0	100.0
	Underachiever	.0	100.0	100.0

a.100.0% of original grouped cases correctly classified.

Table 5 presents the results for the classification results. The result indicates that 100% of the gifted students in the study grouped cases were accurately classified. It also shows that 100% of the gifted underachievers and potential achievers in the study were perfectly classified. The research question can therefore be answered that the classification in the function were 100% accurately classified in all the group cases.

Discussion

The findings from this study revealed that intelligence cannot and should not be recognize as a predictor capable of discriminating the gifted adolescent into potential and underachievers in Mathematics. This reason for this may not be farfetched because the high IQ is one of the strongest indices of the natural mental ability that qualifies a student into the population of the gifted. Therefore, having a high IQ even though correlates with achievement (Dada, 2015), it is not a discriminant function of potential and underachiever in mathematics achievement. The implication of this is that even though the IQ of a gifted adolescent may be high, it is not a reliable discriminator of potential and underachievers gifted adolescent with respect to mathematic achievement. This finding corroborates the finding of Dada (2013) on the level of intelligence on mathematics achievement among the gifted students. The study reported that there is no significant effect of the level of intelligence on mathematics achievement of gifted students.

The mathematics self-efficacy was found in this study to be the strongest predictor that discriminate potential achievers from underachievers in mathematics. This finding is related to the reports of Bandura (1997) as well as Schunk and Pajares (2009) that performance in mathematics is critical to the levels of self-efficacy in addition to many philosophical position that self-efficacy is a strong determinant of achievement among the gifted students. They reported that students who have low levels of mathematics self-efficacy are at a high risk of underperforming in Mathematics, despite their high mental abilities. Most commonly mentioned and a significant predictor of mathematics underachievement is evidence of a low self-concept, negative attitudes toward mathematics and /or teachers, low motivation

regarding mathematics achievement, classroom mathematics exercises and assignments, and mathematics goal evaluation (McCoach & Seigle, 2003).

Other attributes often found are Self-regulation, including the use of cognitive and metacognitive strategies and self-management is an area often minimally developed in underachievers. Underachieving students are reported to attribute success to innate ability and do not believe that achievement is related to effort. Anger, frustration, hostility, and rebelliousness may be present. Poor study habit, lack of persistence, dependency and impulsiveness will probably be part the high and low achievers. The key features found to distinguish achievers from underachievers are the goals set for themselves and the effort they make to achieve those goals (Clark, 2008).

In addition to the larger group of consistent underachievers, there is another group of students with different characteristic who underachieve with some regularity and are at risk academically. Delisel (2004) calls them "Selective Consumers" or "Non producers" and Coil (2004) calls them "Hidden Underachievers". These are students who get fairly high grades most of the time, but do very little, just enough to get by. They see themselves as academically competent and expect a good grade, but are reticent to put forth much effort, especially when "busywork" is assigned. The level of performance or evaluation that is the outcome of their work does not bother them. They look for the easiest problems and by avoiding challenges; they do not build their potential or find the excitement of intellectual pursuits.

In similar vein, all other psycho-social predictors; mathematics task commitment, parental influence, mathematics interest, peer influence, as well as career aspiration in mathematics have been found as reliable discriminator of gifted potential and underachievers in mathematics. The important implication to draw from these findings is that teachers and parents of the gifted adolescents should recognize that these psycho-social variables play significant role on the mathematics achievement of the gifted children. Therefore, it is of necessity that the selected psycho-social indices highlighted in this study be critically considered in the formal and informal programme of the gifted.

Conclusion

One might have proper understanding of the concept and effect of psycho-social indices on Mathematics achievement of the gifted students going by their pattern of behaviour over time. A noticeable pattern of underachievement occurs, when you see special moments of brilliance and before long it is gone. This study has pointed out that lack of mathematics self-efficacy, teacher, parent and peer attitudes toward mathematics, poor task commitment as well as career aspiration in mathematics all have far reaching influence on whether a gifted child will achieve his or her potential in mathematics or not. The implication is that, there is need to check back to see if the child's old tests show higher results, indicating early potential. If high

mathematics achievement occurred early in a child and is gone now, then, there is an evidence of mathematics underachievement in that child, then the psycho-social predictors should quickly be examined and be responded to accordingly in favour of potential achievement in mathematics.

Recommendations

Ministry of education should conduct a school wide need assessment of secondary school gifted adolescent on their psycho-social needs to enhance policy formulation and improve strategy towards mathematics achievement.

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