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Understanding school effects in South Africa using multilevel analysis: findings from TIMSS 2011

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Abstract

Introduction. Studies of school effect usually evolve around two major issues; understanding of the factors within schools that explain variation in students achievement levels, and how differences among schools account for the variation in their students' achievement levels. Given the limited studies of school effect research in South Africa, this paper explores how different characteristics of students and school are related to performance.

Method. Using the 2011 South African TIMSS (Trends in International Mathematics and Science Study) data, the study employs multilevel analysis to identify the most important indicators of successful schools in South Africa. The initial analysis entails the partitioning of the overall variation in students' achievement level in mathematics into within and between schools that allows us to estimate school effects (the extent to which schools make a difference in students' achievement levels). A follow-up analysis involves the addition of student and school characteristics in the multilevel models to profile students and schools that are most successful.

Results. The multilevel analysis indicated that differences in schools account for about 62% of the variation in students' achievement levels in mathematics. Students are more successfulwhen they attend schools that are adequately resourced, have teachers that are satisfied with their working conditions and that are specialised in the field of mathematics. The results also show that the attitude of the students toward mathematics has an impact on their performance.

Discussion. The findings demonstrate the need for the South African educational policy makers to continue improving the learning environment of less resourced schools and also encourage teachers to instil a sense value and self-confidence in learning mathematics and to improve teacher qualification.

Keywords: Hierarchical Linear Modeling, Multilevel analysis, mathematics, school effectiveness, TIMSS

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Comprensión de los efectos escolares in Sudáfrica a través del análisis multinivel: hallazgos de la TIMSS 2011

Resumen

Introducción. Los estudios sobre el efecto de la escuela, por lo general, giran en torno a dos temas principales: la comprensión de los factores dentro de las escuelas que explican la variación en los niveles de los logros de los estudiantes de logros, y las diferencias entre las escuelas respect a la la variación en el rendimiento de sus estudiantes. Dada la limitación de la

investigación del efecto de la escuela en Sudáfrica, este trabajo explora cómo las diferentes características de los estudiantes y de la escuela están relacionados con el rendimiento.

Método. Utilizando los datos del TIMSS Sudáfrica 2011 (TIMSS), esta investigación emplea el análisis multinivel para identificar los indicadores más importantes de las escuelas exitosas en Sudáfrica. El análisis inicial implica la partición de la variación total en los estudiantes según el nivel de logro en matemáticas, intra y entre escuelas. Esto nos permitió estimar los efectos de la escuela (en la medida en que las escuelas hacen una diferencia en los niveles de logro de los estudiantes). El análisis de seguimiento consistió en la adición de estudiantes y escolares características en los modelos multinivel para perfilar los estudiantes y las escuelas que tienen más éxito.

Resultados. El análisis multinivel indica que las diferencias en las escuelas representan alrededor del 62% de la variación en los niveles de logro de los estudiantes en matemáticas. Los estudiantes con más éxito son los que asisten a las escuelas que cuentan con recursos adecuados, tener maestros que están satisfechos con sus condiciones de trabajo y que están especializados en el campo de resultados matemáticos. También muestran que la actitud de los estudiantes hacia las matemáticas tiene un impacto en su desempeño.

Discusión. Los resultados demuestran la necesidad de que los responsables de las políticas educativas de Sudáfrica sigan mejorando el ambiente de aprendizaje de las escuelas con menos recursos y también animen a los profesores a inculcar un sentido de valor y confianza en sí mismo en el aprendizaje de matemáticas y mejorar la cualificación del profesorado.

Palabras clave: jerárquico lineal de modelado, análisis multinivel, las matemáticas, la eficacia escolar, TIMSS.

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Introduction

Over the past decades, large scale assessment data and analyses have played an important role in developing an understanding of school effects—the extent to which a single school makes a difference in learning. Multilevel models, in recent years, are the preferred statistical analyses as these models allow researchers to model the multilevel structure of the schooling system which is students nested in classes which are nested in schools. However, in South Africa, despite the availability of large scale datasets that provides opportunities for the multilevel analyses, only a few research publications have employed multilevel models to analyse school effects.

The South African data sets available and suitable for multilevel analysis include international bench marking studies such as SACMEQ (Southern and Eastern African Consortium for Measuring Educational Quality) and TIMSS (Trends in International Mathematics and Science Study). The analysis of the SACMEQ data using multilevel models indicated that, in all the 14 sub-Saharan countries involved in the studies, schools seem to make significant differences in their grade 6 students' achievement levels (see (Lee, Zuze, &

Ross, 2005) and (Hungi & Thuku, 2010)). The analysis by Hungi & Thuku, 2010 also revealed that South Africa, along with Uganda, and Namibia showed the largest variation between schools demonstrating the extent to which schools make a difference in students' learning outcomes and the need to develop an understanding of school effect in South Africa.

School effectiveness conceptual framework

The focus of the study is to explain how contextual factors relating to students, their families and schools have an impact on the effectiveness of schools. There are two broad components that drive the conceptual frameworks of school effectiveness research. The first is the sociological view, which covers four main areas namely; ecology, milieu, social system and culture. The second framework, which is also the framework used in this article, is based on the economic model of schooling (Levin, 2001) which is comprised of 3 dimensions which are the inputs of schooling, the educational process and the outputs of schooling.

Figure 1 provides an illustration of the economic conceptual model of schooling which shows the process of education occurring at three levels; the school, the classroom as well as

the student. It is important to note that the three levels are interlinked or multilevel in nature, meaning that activities at one level is influenced by activities at higher levels (Willms & Somer, 2001).

The two dimensions that influence schooling outcomes are "inputs to schools" which refers to factors like school structure for instance the size of the school and the location of the school. It also includes student characteristics and physical resources available to teachers to allow for adequate teaching to take place. Considering these factors it is clear that "inputs to schools" are factors that are usually given to a school and hence the lack of or abundance of these resources are out of the schools control. The other dimension is "school and classroom processes and practices" which include information like school social and academic climate, curriculum, instructional practices and social organisation. This is usually the dimension of interest for most educational policy makers because elements of processes and practises are to some extent within the control of the school and refer to issues like management style.

Figure 1. **A multilevel conceptual framework of school effectiveness**
(Rumberger & Palardy, 2004)

The analysis of the 1995 TIMSS South African data using multilevel models demonstrated that about 55 percent of the variation in students' achievement levels in mathematics can be explained by the differences in the quality of the schools they attend (see(Howie & Plomp, 2003)).The analysis by Howie and Plomp (2003) also showed that

students' proficiency in the English language is an important determinant of their success in learning mathematics. Their multilevel analysis demonstrated that learners are successful learning mathematics in schools where teachers have more time for work and lesson planning.

Analysis of the results of the South African TIMSS data between 1995 and 2003 showed no significant improvement in the average Mathematics performance (Reddy, 2012); however, there appears to be a significant improvement between the 2003 and 2011 cycles. This significant improvement could be due to policies and curriculum changes implemented by the Government after 1994 in an attempt to rectify the inequality between schools as a result of the legacy of apartheid.

Objective
The question is ‘what are the South African educational policies that seem to make a difference in students’ achievement levels?’ Using multilevel models this article aims to profile successful schools that provide enabling environments for learning mathematics.

Method

Student and school background factors
Variables considered in the analyses were either taken directly from the background questionnaires or constructs were created that combined a number a variables measuring the same underlying construct. IRT scaling methodology was used to construct the scales. Details of the scale creation for all the TIMSS constructs can be obtained in the International TIMSS user guide (Joncas & Foy, 2013).

Output measures
TIMSS follows a matrix-sampling design which meant that students did not respond to all the items hence Item Response Theory was used to impute student scores and to create 5 plausible values for each student which was used in HLM analysis (P. Foy, Brossman, & Galia, 2011).When applying Item Response Theory, estimates of student’ ability are improved when more items are included in a test which also reduces the measurement error. By using the matrix sampling design however TIMSS was able to use fewer responses from each student as well as student background characteristics to impute students’ scores even though student were not expected to respond to all the TIMSS items. The TIMSS scale

average is fixed at 500 with a standard deviation of 100.We used students’ mathematics score on this scale as our dependent variable.

***Table 1.* Student and School level variables included in the analysis**

Variable Variable composition

Student

Background

Age
• 10 - 13 years;
• 14 - 16 years;
• 17 and older
The age variable was categorised as follows:

Parental
Involvement
• Seldom
• Weekly
• Daily
• My parents ask me about what I learn at school;
• I talk about my school work with my parents;
• My parents make sure that I set aside time for my homework;
• My parents check if I do my homework.

Bullying
• Almost weekly
• About monthly

• Almost never
• I was made fun of or called names;
• I was left out of games or activities by other students;
• Someone spread lies about me;
• I was hit or hurt by other students;
• I was made to do things I did not want to do by other students.
Student likes learning maths
• Do not like learning Mathematics
• Somewhat like learning Mathematics
• Like learning Mathematics
• I enjoy learning Maths;
• I wish I did not have to study Maths;
• Maths is boring;
• I learn many interesting things in Maths;
• I like Maths.
Student values mathematics
• Do not value
• Somewhat value
• Value Mathematics
• It is important to do well in Maths;
• Learning Maths will help me in my daily life;
• I need Maths to learn other school subjects;
• I need to do well in Maths to get into the university of my choice;
• I need to do well in Maths to get the job I want;
• I would like a job that involves using Maths.
Student is confident in learning mathematics
• Not confident
• Somewhat confident
• Confident in learning Mathematics

• I usually do well in Maths;
• Maths is more difficult for me than for many of my classmates;
• Maths is not one of my strengths;
• I learn things quickly in Maths;
• Maths makes me confused and nervous;

• I am good at working out difficult Maths problems;
• My teacher thinks I can do well in Maths;
• My teacher tells me I am good at Maths;
• Maths is harder for me than any other subjects.

School Contextual

Maths specialisation

• No Maths major
• Maths major No Maths major; Maths major

Resources shortages

• Affected a lot
• Somewhat affected
• Not affected
• Instructional materials (textbooks);
• Supplies (paper, pencils, etc);
• School buildings and grounds;
• Heating/cooling and lighting systems;
• Instructional space;
• Technology competent staff;
• Computers for instruction;
• Teachers with a specialisation in mathematics;
• Computer software for mathematics instruction;
• Library materials relevant to mathematics;
• Audio-visual resources for mathematics instruction;
• Calculators for mathematics instruction;

Teacher working conditions

• Serious problems

• Minor problems
• Hardly any problems
• The school building needs significant repair;
• Classrooms are overcrowded;
• Teachers have too many teaching hours;
• Teachers do not have adequate workspace;
• Teachers do not have adequate instructional materials and supplies;

School SES
• Low status
• Medium status
• High status
• Population size of the area surrounding the schools;
• The percentage of students from economically advantages or disadvantages homes;
• Average income level of the schools immediate surrounding area.

Procedure: data and study variables

The South Africa 2011 TIMSS was co-ordinated by the Human Sciences Research Council under the auspices of the International Association for the Evaluation of Educational Achievement (IEA). TIMSS utilises a stratified systematic two-stage probabilityproportional-to-size (PPS) sampling methodology. In South Africa a total of 298 schools were sampled and an in-tact grade 9 class was randomly selected and included in the study, which provided a sample size of 11969 students. Details of the sampling methodology can be obtained in the International TIMSS user guide (Joncas & Foy, 2013)as well as (Wu, 2010). The study involved students' response to mathematics and science questions to assess their success in learning mathematics and science in grade 9. TIMSS also administered background questionnaires to the school principal, the teacher as well as the student. Our analysis in this paper is based on students' performance in mathematics. We now provide a description of the variables used in our analysis.

Statistical Analysis

Due to the hierarchical nature of educational data; multilevel modelling techniques will be utilised using a software package called Hierarchical Linear Modelling (HLM). Multilevel modelling works on the same basis as Ordinary Least Squares (OLS) regression techniques and the same assumptions apply. One of the challenges however with using OLS to analyse educational data, is that it does not adequately account for variance that is integral at each of the levels within the hierarchy (Willms & Somer, 2001).

In the current study a 2-level HLM model was created with the student background variables at the first level and school level variables at the second level which were all included in the model using grand mean centering. For the current analyses the student sampling weight (TOTWGT) was utilised at the first level (student level) and it is a composite of six factors namely; the school, class and student weight, as well as non-response adjustment factor for each of the school, class and students weights.

The Multilevel Analysis

Following Raudenbusch and Bryk (2001), our multilevel analysis started with what is often referred to as the null model. This is analogous to a one-way analysis of variance (ANOVA) with students' mathematics achievement as the dependent variable and the school they attend as the independent variable (group variable). The ANOVA analysis allows us to test the hypothesis that the variability in performance between schools is significantly different from zero. Furthermore, the initial multilevel level ANOVA modelling also provide

estimates of total variation in students' mathematics achievement partitioned into the between school variance (τ_{00}) and the within school variance (σ_2) that allowed us to calculate the intraclass

correlation coefficient (ICC) which is the proportion of total variation in students' mathematics achievement levels that can be explained by the variation in school achievement levels. The ICC for this study is calculated as follows:

(where is the ICC)

= 0.62 = 62%

This means that differences in the schools' student explain about 62 percent of the total variation in their mathematics achievement levels. Differences in students' background characteristics within schools explain the rest of this variation (about 38%).

The next stages of the analysis attempted to isolate the specific school and student background factors related to students' success in mathematics. This involved testing the statistical significance of the impact of a number of variables describing the background characteristics on students' mathematics achievement within schools. A similar analysis was carried out to identify a number of school and classroom characteristics that have significant impact on schools' mathematics achievement levels. In our final model, we included only the school/classroom and students' background variables that were statistically significant at alpha level of .05. Below is the statistical equations used in estimating our parameters in the final model.

The Final multilevel level equation (within and between schools)

Within school: $Y_{ij} = \beta_{0j} + + \beta_{1j}(\text{AGE17PLU})_{1ij} + \beta_{2j}(\text{AdultInv})_{2ij} + \beta_{3j}(\text{Bully})_{3ij} + \beta_{4j}(\text{LikeMath})_{4ij} + \beta_{5j}(\text{ValMath})_{5ij} + \beta_{6j}(\text{ConfMath})_{6ij} + r_{ij}$

Between school: $\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{SchSES})_j + \gamma_{02}(\text{Math\_Res}) + \gamma_{03}(\text{Mathspec}) + \gamma_{04}(\text{Teach\_wrkcond}) + \mu_{0j}$

$\beta_{1j} = \gamma_{10} + \mu_{1j}$

$\beta_{2j} = \gamma 2_0 + \mu_{2j}$

$\beta_{3j} = \gamma_{30} + \mu_{3j}$

.

.

$\beta_{6j} = \gamma_{60} + \mu_{6j}$

Where :

Y_{ij} = the mathematics score of pupil *i* in school *j*;

β_{0j}= the intercept for the jth school (the mean mathematics achievement level of school j);

$\beta_{1j}, \beta_{2j}, \beta_{3j}, \beta_{4j}, \beta_{5j}, \beta_{6j}$= the regression coefficients associated with the level 1 variables. ;

γ_{00}= National mean (grand mean);

$\gamma_{01}, \gamma_{02}, \gamma_{03}, \gamma_{04}, \gamma_{05}, \gamma_{06}$ = the regression coefficients associated with the level 2 variables;

μ_{0j}= the deviation of the school mean from the national (overall) mean;
r_{ij}= the deviation of the student score from the school mean;
Level-1 predicators are**:**

- AGE17PLU: This was a dichotomous variable comparing over age students to students who are the appropriate age for the grade.
- AdultInv: The involvement of an adult in the school work of the student.
- Bully: Student responses to being bullied at school.
- LikeMath, ValMath, ConfMath: Students attitude toward mathematics.

Level-2 predictors are**:**

- SchSES : School Socio Economic Status;
- Math_Res: Mathematics Resources shortages;
- Math_Spec: Specialisation in mathematics during qualification;
- Teach_wrkcon: Teacher satisfaction with working conditions.

Results

The results of the multilevel models are presented in Table 2 and the output will explained in two parts; the impact of the significant student background (level-1) factors, followed by the impact of the significant school/teacher background factors.

The impact of student background characteristics on mathematics achievement

Table2 shows that age plays an important role in student performance. In South Africa, children start school at the age of 7 so that without repetition, the expected age for grade 9 students is 16.Our analysis grouped students into age appropriate or less and overaged
(17 years of age and older) and estimated the impact of age on mathematics

achievement. The Table indicates that students who were 16 years or younger obtained on average 21 points more than those students who were 17 years of age and older.

The results also show that students attitude toward mathematics is also extremely important and is associated with their mathematics performance. Students who said they liked mathematics performed better than those students who do not like mathematics with student who liked mathematics obtaining on average 16.57 points more than those who said they do not like mathematics. Students who felt confident in learning mathematics scored on average 18.8 points more than those students who said they were not confident in learning mathematics.

Adult involvement in the school work of students is associated with mathematics performance. The data shows that adults who are too involved in the after hour school work of their children is negatively associated with the average performance of the student. Students whose parents are involved in homework on a daily basis perform on average 8.48 points lower, than those students whose parents are involved on a weekly basis.

Another interesting finding is that students in schools who say they are almost never bullied score on average 7.73 points higher than those students who say they are bullied on a daily basis.

School factors associated with school effects

Students who attend schools where they are taught by teachers who are happy with their working condition score on average 51.84 points higher than students who attend schools where teachers are unhappy with the working conditions in their schools.

Table 2 shows that students in school where teachers reported that resource shortages were not a problem scored on average 37.77 points more than students in schools where teachers said resource shortages were a problem. It is clear from the model that students' who attend schools where teachers have specialised in mathematics score on average 26.24 points more than students who attend schools where the teachers have not specialised in mathematics.

School Socio Economic Status (SES) is a significant factor associated with school performance with students in high SES schools performing better than students in low SES

schools. Students who attend high SES schools obtain on average 23 points more than those students who attend low SES schools.

Table 2. **The HLM models**

Variables	Null model	Model 2-with only student background variable	Final (full) model
Intercept	344.00	343.88	349.76
Student Age		-20.93	-20.93
Adult involvement		-8.48	-8.48
Bullying		7.73	7.73
Student like Mathematics		16.57	16.57
Student value Mathematics		6.70	6.70
Student confidence		18.80	18.80
School SES			23.00
Maths Specialisation			26.24
Resource Shortages			37.77
Working Conditions			51.84
Variance component analysis			
Within school	3196.27	2620.36	2620.23
Between school	5242.61	5283.08	2753.95
Percentage of variance explained	62%	33%	49%

Major finding and discussions

The results from the multilevel model show that the variance explained by Mathematics performance between schools is 0.62 or 62%. This means that the differences in the schools that students attend account for about 62 percent of the variation in their achievement levels in Mathematics. This percentage is slightly higher than 50%reported by Howie & Plomp (2003). Given that, over the past two decades, the South African government has made concerted effort to improve quality education, especially for the poor

and marginalized, one would expect a decrease in this percentage. This means that policy initiatives to improve resources in poor schools might not be yielding significant learning outcomes returns.

Within school analysis-student characteristics associated with quality

Student age has been included in the study because research has shown that there is a relationship between student age and performance (Grissom, 2004). In South Africa the grade appropriate age at Grade 9 is between the ages 14 and 16 and the analysis shows that students aged between 14 and 16 perform better than students aged 17 and older. There appears to be some contradiction in research findings with regard to age, with some studies finding no significant difference in age and student performance (Kunje, Selemani-Meke, & Ogawa, 2009). Other studies have found that a significant linear relationship exists between age and performance and that over-age students perform better than grade-age appropriate students (Grissom, 2004). However, Grissom states that this linear relationship exists only in the younger grades and that as students progress to the higher grades this linear relationship becomes a negative one (Grissom, 2004).Studies have shown that the main cause of overage students is grade repetition(Department of Basic Education, 2011) .

In the current analysis three aspects of attitudes toward mathematics was considered namely; students confidence in learning mathematics, whether students liked learning mathematics and finally whether they valued mathematics. The results show that all the attitudes mentioned has a significant association with mathematics performance. Specifically students who like, value and who are confident in learning mathematics generally perform better than students who have the reverse attitude to mathematics. This finding is concurs with studies done by the Organisation for Economic Co-operation and Development in 2004(Organisation for Economic Co-operation and Development, 2004)as well as (Zan & Martino, 2007).

The results also show an association between parental involvement and student mathematics performance which is contradictory to studies done by Chiu and Ho (2006). This analysis shows that parents who are involved in the students' school work on a daily basis have a negative effect on student Mathematics performance which is supported by

(Hoover Dempsey et al., 2005) found that parents who are overly involved in the students school work tend to have a negative association with student performance. (Domina, 2005) found that the association between parental involvement and student performance becomes a negative and sometimes also an insignificant one once family and school background is controlled for. Other studies have also found that parental is extremely significant in the younger years but becomes insignificant as the student gets older (Crosnoe, 2001).

Bullying at school seems to be a problem and over the years the percentage of students who have been bullied has increased. The TIMSS 2011 data shows that 75% of students have been bullied to some extent (Mullis, Martin, Foy, & Arora, 2012). Bullying has almost doubled in the past 11 years since the TIMSS 2002 cycle. The percentage of students who said they were bullied often in 2011 (27.9%) is almost double the figure in 2002 (16%) (Reddy, 2012). The results of the current study show that students who reported never or almost never being bullied obtain higher scores than those students who say they are bullied very often. This outcome is echoed by (Nakamoto & Schwartz, 2010) who stated that bullying has a negative impact on student achievement which means that students who experience bullying at school do not perform as well as students who are not bullied..

School characteristics and students' success in learning

Teacher working conditions can adequately be described by four school resources which, when adequately provided to the school, would result in improved working conditions for the teacher(Johnson, 2006).These are adequate physical conditions (buildings), an orderly environment (school climate), instructional resources (textbooks and blackboards) and reasonable workloads (Johnson, 2006). The results shows that student who are taught by teachers who are happy with their working conditions perform better on average than students taught by teachers who are not happy with their working conditions. These results are echoed by researchers like (Rosenholtz & Simpson, 1990) as well as (Firestone & Pennell, 1993) .

The results show that students whose teachers have specialised in Mathematics or Mathematics education obtain higher scores than students taught by unspecialised teachers.

This finding is in line with previous research that shows that merely having a post school qualification is not enough to ensure optimal students test scores but that it is vital to ensure than teachers who are responsible for teaching mathematics have also specialised in the area as well (Goldhaber & Brewer, 2000)as well as by (Rowan, Chiang, & Miller, 1997) .

Shortage of instructional resources was a scale calculated and included school resources like mathematics textbooks, stationery, school building, and classrooms. The results show that students who were taught by teachers who experienced little or no shortages performed better than student in schools where resource shortages were experienced. This finding is supported by (Fuller & Clarke, 1994)that suggested the availability of educational resources had the most positive significant relationship to student performance. The situation in developed and developing countries are however very different with factors pertaining to the school organisation and instructional variables (Scheerens, 2000) as being more important that the availability of instructional material.

School socio-economic status was also found to be associated with student mathematics performance in that students who attend high SES schools perform better than their counterparts. This is in-line with findings by (Willms & Somer, 2001) as well as that of (X. Ma & Xu, 2004) and (X. Ma & Klinger, 2000).

Concluding Remarks

The development of an effective education system that provides opportunities for all students to be successful at schools has been an important objective of countries around the world. This objective is largely driven by the contention that a successful education system where most citizens are educated often leads to a prosperous economy, social cohesion and quality of life. Developing an effective education system is a complex process that requires continuous assessment and evaluations of the educational processes and outcomes. At the international level, large scale educational assessments such as the Trends in International Mathematics and Science Study (TIMSS) provides opportunities for educational systems to conduct “comprehensive state-of-the-art assessments” of students’ achievement in relations to their schooling and learning experiences. The analyses of these data often demands complex statistical procedures often referred to as multilevel models that allow us to assess school effect—the extent to which schools make a difference in students’ success in schooling. In South Africa, analyses of school effects using multilevel models are rare.

Our paper, using the 2011 South African TIMSS data, employs multilevel models to identify the most important indicators of successful schools in South Africa. The multilevel analysis indicates that students’ performance is higher in schools that are adequately

resourced; employ teachers who are satisfied with their working condition and are taught mathematics by teachers who have specialised in the field they are teaching. Within schools, students’ attitude toward mathematics is extremely important because those who like mathematics, who value mathematics and are confident in learning mathematics tend to be more successful.

The findings demonstrate the need for the South African government to continue improving the learning environment of less resourced schools and also encourage teachers to make learning of mathematics more fun. About two decades ago, South Africa became democratic country moving away from an apartheid education system where access to quality education was determined by once skin colour to a constitutionally guaranteed quality education for all students irrespective, of their background characteristics. The policy effort largely involves improving resources in schools located in poor communities. Our findings suggest the need to include policy initiatives to help students develop positive attitude and confidence learning mathematics.

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