Household Factors as Predictors of Pupils' Competency in Mathematics in universal Primary Education (UPE) Schools in Luweero District, Uganda

Asmaa Elsayed Emara, Sofia Sole Gaite, Kayindu Vincent

(Kampala International University, Uganda)

***Abstract*:- This study was carried out in Luweero district, Uganda with three objectives namely: to establish how parents' provision of mid-day meals affects Universal Primary Education (UPE) children's competency in Mathematics in Luweero district, Uganda; to examine how parents' visiting of the schools to talk about their children's learning affects their children's competency in Mathematics in Universal Primary Education (UPE) primary schools in Luweero district, Uganda; and to assess how parents' level of education affects their children's competency in Mathematics in Universal Primary Education (UPE) schools in Luweero district, Uganda. A total of 500 pupils from ten primary schools participated in the study. The findings of the study were that the provision of mid-day meals had a positive influence on pupils' competency in mathematics; parents' visiting the school to talk about their children's learning had a relatively positive influence on their children's competency in mathematics; and parents' level of education had minimal influence on their children's competency in mathematics. Based on these findings, it was recommended that parents in Luweero district, Uganda should put in more effort to provide all their children with meals for lunch; there is need for parents to regularly visit schools where their children are studying from to discuss with teachers their children's progress and to forge the way forward; and that all parents, educated or not, should support and urge their children to study very hard so as to excel academically.**

Key words: **Household factors; pupils' competency, Mathematics.**

I. INTRODUCTION

With the introduction of Universal Primary Education (UPE) in Uganda during the reign of President Yoweri Kaguta Museveni of the National Resistance Movement, many pupils have since then been enrolled in primary schools. Their performance in subjects like Mathematics is however a challenge, especially in rural areas. Whereas school-based factors contribute to this, even household factors do.

In this study, household factors were examined to find out their influence on the competency of primary school pupils in Mathematics in Luweero district. Household factors are the issues in homes where learners come from which can affect their studies and academic performance at school. The factors which this study addressed were: Parents' provision of mid-day meals to their children, parents' level of education, as well as parents' visiting of the school to talk about their children's learning. The competency in Mathematics was measured using seven levels. Level 1 was taken as the learner's inability to count at least four out of five numerical numbers from one to nine. Level 2 was taken as the learner's ability to count numerical numbers from one to nine. Level three was taken as the learner's ability to recognize numerical numbers from 10 to 99. Level four was taken as the ability to solve at least two numerical written addition sums of primary two level. Level five was taken as the ability to solve at least two numerical written subtraction sums of primary two level. Level six was taken as the ability to solve at least two numerical written multiplication sums of primary two. Level seven was taken as the ability to solve at least two numerical written division sums of primary two level.

Statement of the Problem

Luweero district has, in many years; ranked poorly in pupils' performance in the National Examinations. The Uganda National Examinations Board has on some occasions cancelled the Primary Leaving Examinations results of candidates in Luweero district after they were found guilty of their involvement in examination malpractices. In January 2013, for example, UNEB with held the examination results of the affected candidates citing external assistance, collusion and impersonation among others. Luwero primary pupils' performance in l998 PLE drastically dropped compared to the 1999 results. Of 7,353 pupils who sat for the examinations in the year 2000, only 485 passed in grade A, while in 1999, 640 of 6762 pupils who sat for the exams passed in grade A. There was a drop in the general performance in 1998 which was attributed to a general loss of concentration by the teachers on one hand, and a sharp increase in the number of pupils sitting for the examinations on the other (https://ugandaradionetwork.net).

At the national scale, Mathematics is performed poorly. for example, in the 2019 PLE results, The Uganda National Examinations Board-UNEB showed that a total of 695,804 candidates from 13,475 centres (schools) registered for PLE in

2019. Of this number, 473,893 68.2% were Universal Primary Education (UPE) beneficiaries, and 221,912 31.8% of the candidates were Non-UPE.The UNEB Secretary General Dan Odongo said at least 7.6% of the pupils managed either a distinction 1 or 2 in English while 14% managed the same in SST. For Mathematics and Science, while the general performance improved, fewer learners managed a distinction at that level.Just like last year, Odongo noted that in both English and Mathematics performance was poor in questions where candidates were required to apply knowledge in problem solving situations or express themselves freely. Candidates were more comfortable with questions that are direct and based on recall (://www.saltmedia.ug/en/local/1865-science-and-mathematics,-the-worst-done-subjects-in-ple-2019.html).This shows that pupils' competency in Mathematics is a problem among many pupils. But, to what extent can homebased factors explain the learners' competency in Mathematics? the current study was carried out in February 2020 before the Government closed schools because of COVID-19, to get answers to that question.

Specifically, three Research Questions were asked, namely:

1. How does parents' provision of mid-day meals affect their children's competency in Mathematics in Universal Primary Education (UPE) schools in Luweero district, Uganda?
2. How does parents' visiting of the schools to talk about their children's learning affect their children's competency in Mathematics in Universal Primary Education (UPE) schools in Luweero district, Uganda?
3. How does parents' level of education affect their children's competency in Mathematics in Universal Primary Education (UPE) schools in Luweero district, Uganda?

II. LITERATURE REVIEW

In teaching, one of the aspects of much concern to all the stakeholders in the education fieldis learners' academic competency, that is, their ability to answer questions correctly from what they were taught earlier. Home-based factors, such as the parents' provision of food to their children, parents' visiting of school and parents' level of education can affect the extent to which their children are able to do mathematical elements such as doing subtraction, multiplication, identifying numbers, additions and so forth.

In connection to this, a number of researches have been carried out, such as the following:

Farzana (2011) assessed the impact of school meals on the participation of learners in rural India schools. He analysed the effect of transition from monthly distribution of free food grains to the daily provision of free cooked meals to school children on enrolments and attendance in a rural area of India. The results suggest that programme transition had a significant impact on improving the daily participation rates of children in lower grades. The average monthly attendance rate of girls in grade one was more than 12 percentage points higher while there was a positive but insignificant effect on grade one boys' attendance rate. The impact on enrolment levels was insignificant.

Ayatollah and Venkatesan (2017) carried out a study on the relationship between Mathematics anxiety, Mathematics performance and Academic hardiness in high school students. The sample comprised 284 (144 males and 140 females) 10^{th} grade high school students from Karnataka state. Pearson correlation analysis and two independent samples T-test are used to analyze the data. The results revealed that mathematics anxiety has significant negative correlation with mathematics performance but no significant correlation was detected with academic hardiness. It was also found that the gender differences in mathematics anxiety were significant, whereas no significant differences were detected between boys and girls in mathematics performance and academic hardiness. This study established the fact that the performance of students in mathematics can be perceived by mathematics anxiety and females scored slightly higher on this variable but this relation has not observed with academic hardiness.

As Abeya Degefe (2018) observes, the family is the basic unit of society. The children are usually strengthened and shaped by the family and the surrounding homes. These are the first school for children. The mother is the most important individual in the life of the children. Mother becomes literally the child's first teacher to control and programme the child's learning experiences. In doing so, she occupies two vital roles: (1) she serves as controller of stimulus events: that is, she is the one with the most influence over the home environment and the one who determines which events in the home impinge up on the children. (2) She is the controller of the reward system: that is, she responds to the behavior of the child either positively, negatively or neutrally (Sirin, 2005). Among the out-of school variables which influence academic achievement of children, much attention seems to be given to parental education. Related to this, a number of studies indicate that there is direct relationship between parental education and academic achievement. For instances, Baker and Steveuson's study (1986) found that well educated mothers have higher knowledge of their children's schooling, more contact and communication with the school, aware of their children's achievement, monitor their children's progress and lead them to pursue higher education. Barnard (2004) studied the effect of parental involvement both in school and at home on the success of their children. Barnard found that parental involvement in elementary school was significantly associated with increased on-time high school completion, and the higher grade-completed by a student. Pupils with educated parents are supported and seem to be better in their academic performance, while pupils lacking educated parents lack support and tend to perform poorly.

One of the prominent factors that affect academic performance of students is inability of the learner to study well, concentration during study time, making decision where to study from (which schools to attend) and how to revise. Effective study is highly influenced by their parental involvement and general condition where to study, and effective environment at home. In relation to this, Brooks - Gunn, & Duncan (2000) stated that, the more a student is exposed to good learning environment in the home, the better his/her academic achievement. Educated parents help their children to study hard. They help their children in arranging time for studies and adjust place for study. They also answer questions that are not clear for children during study. Supportive home environment, including the supervision and structure that parents give children outside of school to support their education, such as limiting television viewing time and providing structured time for home work and learning, contribute to children's academic progress. Many times, this is better done by educated parents as compared to the parents who are less educated (cited in Abeya Degefe, 2018).

Toldson (2008) examined the social, emotional, and cognitive factors contributing to the academic competency of African American males (n=6000). Four overarching components empirically linked to academic performance were identified: 1) personal and emotional factors, such as emotional well-being and self-esteem; 2) family factors, including household composition, parents' education and relationship with their children; 3) social and emotional factors, including economic standing and community involvement; and 4) school factors, relating to their perceptions of school and relationships with teachers.

III. METHODOLOGY

Given the relatively large number of the respondents involved in the study, the study employed a descriptive survey design, using a quantitative approach. A quantitative approach was used since the pupils were administered with a mathematical examination. The scores of the pupils were analysed to establish their competency levels in Mathematics in the public primary schools where thematic curriculum is offered.This study targeted all pupils from primary three to primary seven in the UPE schools in Luweero district. The study was carried out in ten primary schools in the district. The pupils of P.3-P.7 were targeted with a hope that since they had studied what was in the research instrument which was based on the syllabus of P.1, P.2 and P.3, they could give right answers to all the items.The assessment in the learners' competency in Mathematics targeted all children who regularly reside in the homes (the day scholars). A sample of 500 pupils was used in the study. They were selected from ten schools by selecting ten pupils from each class, from primary three to primary seven**.** To test the learners' competency in Mathematics, the researcher adopted the instrument which was used by UWEZO-Uganda in the year 2017 to assess the pupils' level of competency in Arithmetic in the public primary schools in Uganda. After marking the scripts, the percentage distributions and arithmetic means were calculated so as to get answers to the research questions which guided the study.

Limitations of the Study

A few pupils who seemed to be having a negative attitude towards Mathematics seem to have done the examination for the sake of it, probably they feared that their teachers would punish them if they refused to participate. This was realized in the simplest items the researcher would not expect any primary seven pupil to fail, but some failed them.

IV. FINDINGS

Introduction

The researcher first calculated the overall competency levels of the pupils from P.1 to P.7. The findings are shown in table 1.

Table 1: Overall competency levels of primary school pupils in Mathematics in Luweero district, Uganda

Percentage distribution for mathematics competency by class, P.3- P.7								
Class	**Nothing**	**Identify 0-9**	**Identify 10-99**	**Addition**	**Subtraction**	**Multiplication**	**Division**	**Total**
P.3	5.5	16.7	14.9	15.0	10.9	6.4	30.7	100
P.4	2.1	5.4	5.2	6.3	19.6	10.8	50.7	100
P.5	0.7	2.6	2.8	4.1	4.2	6.1	79.7	100
P.6	0.5	0.0	4.4	2.0	5.1	5.5	82.5	100
P.7	0.0	0.0	0.0	0.7	0.0	6.6	92.8	100
Total	**12.4**	**12.4**	**11.8**	**8.8**	**7.6**	**4.7**	**31.7**	**100**

Table one shows that the overall competency level of pupils in Mathematics in the UPE schools was low. For example, 31.7% of the pupils are able to solve division sums. 12.4% failed the exam. In other words, they knew almost nothing in mathematics. Only 23.1% of the pupils could identify 0-9 numerals, though these were mainly pupils in P.1, P.2 and P.3. The table also reveals that only 7.6% of the pupils could do subtractions, though these were mainly pupils in P.1, P.2 and P.3.

The findings on each research question are presented below.

Research Question 1. How does parents' provision of mid-day meals affect their children's competency in Mathematics in universal primary Education (UPE) schools in Luweero District, Uganda?

The findings on this research question are presented in figure 1.

Figure 1 Percentage distribution of Pupils' competency in Mathematics based on parents' provision of mid-day meals.

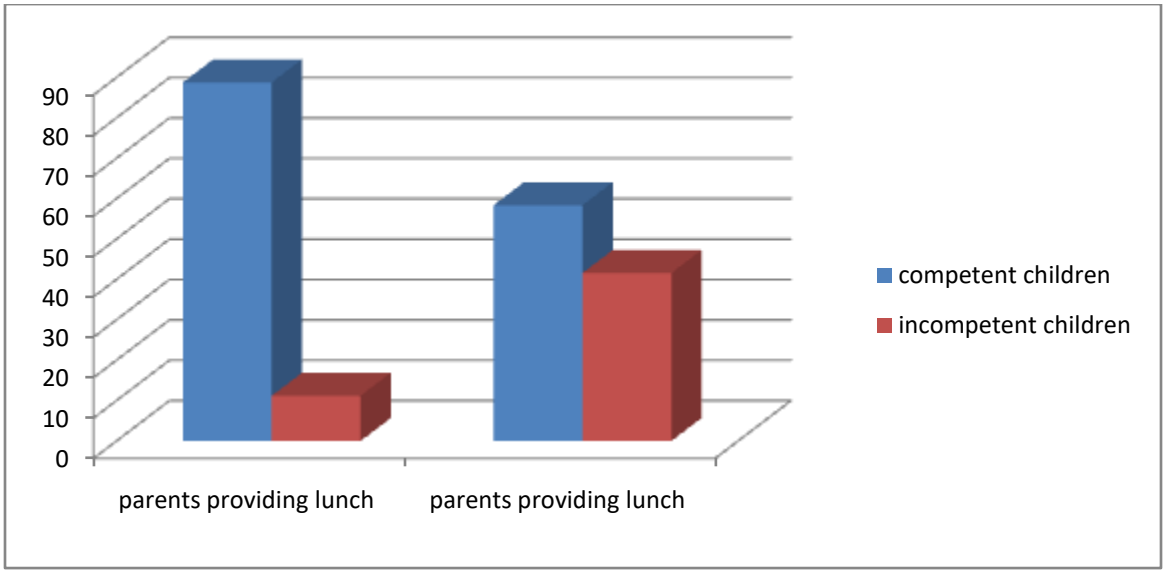
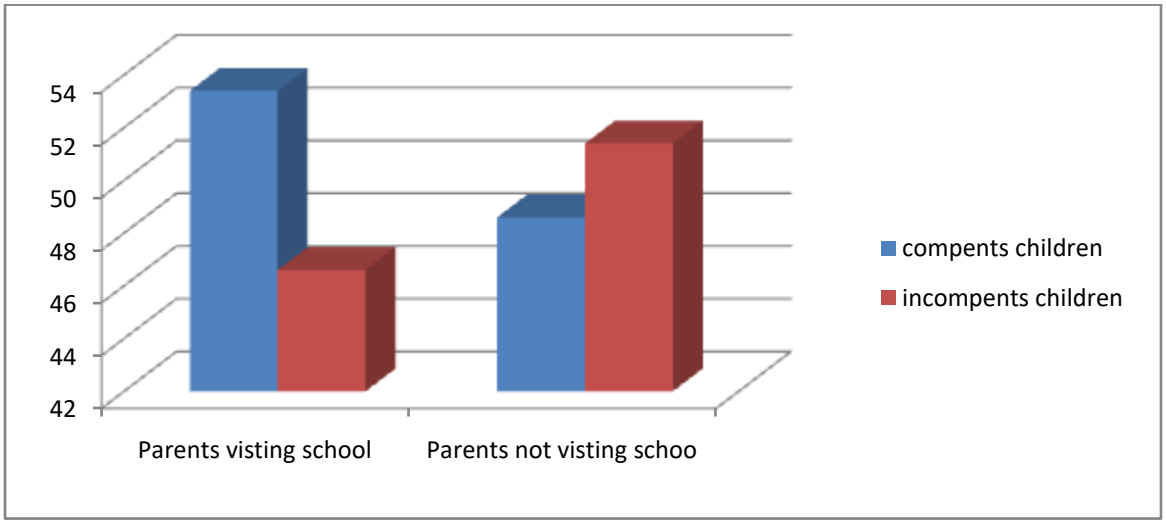


Figure 1 shows that the provision of mid-day meals had a positive influence on pupils' competency in mathematics. 88.7% of all p.3-p.7 pupils, whose parents provided lunch could solve mathematical items, compared to 58.4% pupils whose parents did not provide some form of mid-day meal. The implication here is that providing lunch to the learners is a strong determinant of pupils' concentration on academics which in turn leads to good performance.

Research Question 2: How does parents' visiting of the schools to talk about their children's learning affect their children's competency in Mathematics in universal primary Education (UPE) schools in Luweero District, Uganda?

The findings on this research question are presented in figure 2.

Figure 2 Percentage distribution of Pupils' competency in Mathematics based on parents' visiting of school to talk about their children's learning



The findings on this research question are that parents' visiting the school to talk about their children's learning had a relatively positive influence on their children's competency in mathematics. It was relative in the sense that the percentages of the pupils falling in the categories in question ranged between 48 and 53. For instance, 53.4% of the pupils whose parents visited the school to talk about the child's learning were competent in mathematics, compared to 48.6% of the

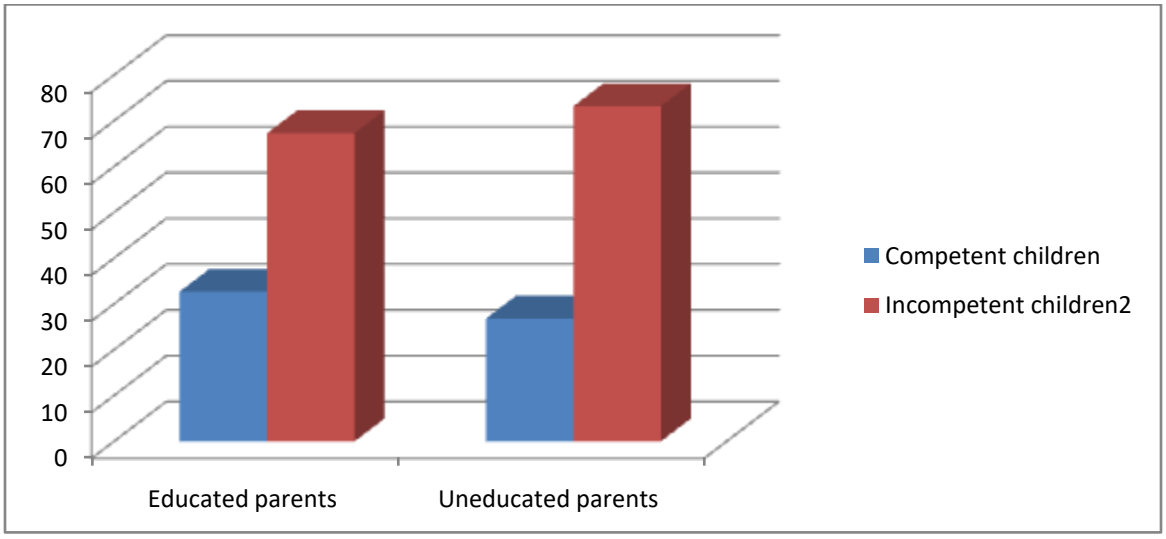
pupils whose parents did not visit the schools to talk about their children's learning.

These findings imply that parents' visiting of schools to socialize with their children's teachers helps to improve the performance of the learners. However, given the very small difference between the competency of the learners whose parents visited the school to talk about the child's learning (53.4%), compared to 48.6% of the competent pupils whose parents did not visit the schools to talk about their children's learning, the small difference of 4.8% reveals that parents' visiting of schools does not contribute much to children's academic performance.

How does parents' level of education affect their children's competency in Mathematics in universal primary Education (UPE) schools in Luweero District, Uganda?

The findings on this research question are presented in figure 3

.Figure 3: Percentage distribution of Pupils' competency in Mathematics based on parents' level of education



The findings on this research question indicate that parents' level of education had minimal influence on their children's competency in mathematics. For instance, 32.7% of the pupils whose parents were educated were competent in mathematics compared to 26.8% of the pupils whose parents were not educated. The meaning here is that, in the context of Luweero district, Uganda where the study was carried out, whether parents are highly educated or not, their children usually perform almost in the same way.

V. DISCUSSION, CONCLUSIONS AND RECCOMMENDATIONS

Parents' provision of some form of mid-day meal and their children's competency in Mathematics in universal primary Education (UPE) schools in Luweero District, Uganda

It was found out that the provision of some form of mid-day meal had a positive influence on pupils' competency in mathematics. This means that if parents provide meals to their children, they eat, get satisfied, which helps them to concentrate on academics and other activities in the school. An hungry child can hardly concentrate. The finding of this study concurs with the finding of the study which was carried out in Uganda by UWEZO in different districts of Uganda, where it was found out that in predominantly rural areas where many parents do not mind to give lunch to their children, the learners tend to perform poorly not only in the schools' ongoing activities, but also in the national examinations, compared to their counterparts in urban first world schools whose parents usually provide lunch or money to buy edibles and drinks while at school in addition to the lunch usually provided by the schools.

The findings of this study are not far different from the study conducted by Opolot-Okurut (2008).The study indicated that teacher practices are dichotomous between the HP and LP schools: (1) the teaching was teacher-centred or student-centred, collaborative or isolated, and conducted through group work or through whole class teaching; (2) the teachers either planned or did not plan their lessons; and they either had sufficient teaching and learning resources or had inadequate resources; (3) the classes were organised as homogeneous or heterogeneous groups and the class sizes were either small (less than 40 learners) or large (over 80 learners); (4) the learners made contributions during the lesson or merely copied notes that the teacher wrote on the chalkboard, dictated or had photocopied for the learners, and the learners either liked or disliked the subject; and (5) the assessment tasks for the learners were mainly drawn from either several sources or from a single class text.

Parents' visiting of the schools to talk about their children's learning and their children's competency in Mathematics in universal primary Education (UPE) schools in Luweero District, Uganda

The findings on this research question are that parents' visiting the school to talk about their children's learning had a relatively positive influence on their children's competency in mathematics. This could be because of the fact that there is a tendency among some teachers to fear or respect some parents. When a parent visits school and talks to the teachers who teach their children, the teachers usually discuss with the parents their children's strengths and weaknesses. In the end, a student can be guided accordingly and hence a possibility of improving academically.

The findings of this study are to an extent in line with Opolot-Okurut (2008) who claimed that the general pattern of the teachers' practices in the HP and LP schools is traditional, involving whole class teaching, teacher dominated lessons that involve telling, questioning and explaining. The students listen to the teacher, do the deskwork assigned to them and copy notes or solutions into their exercise books. Both the teachers talked more than the students did, unlike in the cooperative teaching classrooms (Leung, 1995). It is, therefore, apparent that the similarities among the teacher practices in the two types of schools lie in the fact that they do not follow lesson plans, hardly assign work to the students from the textbooks because they are either few or not available; and follow the same intended curriculum guide documents. The differences lie in the classroom organization due to differences in class size, extent of student engagement and content coverage. The teacher in the HP school organized internal and external discussion groups for the students. In these groups students solve the hard problems together and discuss the solutions. The teachers in the HP and LP schools use different textbooks as class texts.

Parents' level of education and their children's competency in Mathematics in universal primary Education (UPE) schools in Luweero District, Uganda

The findings on this indicate that parents' level of education had minimal influence on their children's competency in mathematics. This finding suggests that in Somalia, both thee educated and the non-educated are either very serious with their children's performance, or both of them take a laissez-faire approach. This could be because of the persistent wars Somalia has much of the time been involved in, or the culture of the people.

Some researchers have assessed the link between culture and performance. For example, Denison (1990) found out that there is a link between certain organizational culture characteristics and performance. In particular, they note that culture will remain linked with superior performance only if the culture is able to adapt to changes in environmental conditions. However, it has been suggested that the relationship between culture and performance is tenuous (Hop*et al*., 1992). Indeed, the growing popularity of the resource-based view of competitive advantage suggests that the degree to which a culture can be theorized to determine a *sustainable* advantage is dependent upon the value, rarity, immutability, and sustainability of the culture concerned (Barney, 1986, 1991).

Conclusions

Based on the findings of the study, the following conclusions were made.

Based on the findings of the study, the following conclusions were made:

1. The provision of some form of mid-day meal had a positive influence on pupils' competency in mathematics.
2. Parents' visiting the school to talk about their children's learning had a relatively positive influence on their children's competency in mathematics.
3. Parents' level of education had minimal influence on their children's competency in mathematics.

Recommendations

The following recommendations were made based on the findings of the study.

1. Parents in Luweero district of Uganda should put in more effort to provide all their children with meals for lunch. This is because, though it was found out that many parents provide meals to their children, not all of them do so.
2. There is need for parents to regularly visit schools where their children are studying from to discuss with teachers their children's progress and to forge the way forward.
3. Although in this study it was found out that parents' level of education had minimal influence on their children's competency, all parents, educated or not should urge their children to study very hard so as to excel academically.

REFERENCES

[1]. Abeya Degefe (2018). The Relationship Between Parental Education and Children's Academic Performance: The Case of Genda Tesfa Primary School, Dire Dawa. *Research on Humanities and Social Sciences.* Vol.8, No.5.

[2]. Ayatollah and Venkatesan (2017). Mathematics anxiety, Mathematics performance and academic hardness in high school students. *International Journal of Educational Sciences,* Vol. 1, pages 33-37.

[3]. Opolot-Okurut (2008). Teachers' Practices in teaching mathematics in high and low performing secondary schools in Uganda. In Owolabi, S. O & Sempebwa, J. (ed). *Research digest.* Kampala International University, 1,2,108-113.

[4]. Starn, C. (2008). Benefits of an Integrated Curriculum. *University of La Verne*. Retrieved Technologies. Issue 4, Volume 2, 226 – 237.

[5]. UWEZO (2011). Are our children learning? Annual learning assessment report. Kampala, Uganda.

[6]. Farzana, A. (2011). The impact of school meals on school participation: Evidence from rural India. *Journal of Development Studies*, Vol.47, issue 11, pg 1636-1656.