



# ATTITUDES OF LEARNERS WITH LOW VISION TOWARDS LEARNING MATHEMATICS IN INTEGRATED PUBLIC PRIMARY SCHOOLS IN NAIROBI COUNTY, KENYA

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**Abstract:** The purpose of this study was to investigate attitudes of learners with Low Vision towards learning Mathematics in integrated public primary schools in Nairobi County. The study adopted a descriptive research design and survey methods. The researcher targeted learners with low vision without other disabilities in classes 4 to 8 as the respondents in order to gather information for the study. Questionnaires were used to collect information from the twenty learners with Low Vision. Test-retest method was used to ascertain the reliability of the research instrument. The quantitative data was analyzed using means, standard deviations, frequencies and percentages. The finding of study was that learners with low vision had a negative attitude towards Mathematics which did not differ across gender. On the basis of these findings, the study recommended that the Kenya government through the Ministry of Education, Non-Governmental Organizations and parents to give priority towards the provision of adequate instructional materials for teaching and teachers should be in-serviced in the use of individualized education programme. A fund be set aside for modifying the environment by the government and be increased in all integrated public primary schools.

**Keywords:** Attitudes, Integrated, Learners with Low Vision and Mathematics

## I Introduction

Education is a vital and a pervasive force in all aspects of life of an individual and society (UNESCO, 1990). As enshrined in article 26 of the Universal Declaration of Human Rights (1948) and as quoted by Okot, Eron, and Kutosi (2000), everyone has the right to education which shall be free and compulsory without discrimination of any kind. This forms an important basis of education for all children in the world regardless of disability. Mathematics is a compulsory subject in both primary and secondary schools in Kenya. However, its poor performance in Kenya national examinations year in year out, remains a serious concern for teachers of Mathematics, parents, curriculum developers and the

general public (Njoroge, 2011). Persistent failure in Mathematics by pupils with disabilities at the primary school level accounts for the low choice of the subject at the secondary school level. This also leads to low access of science and technology courses at the University by this group of pupils (Wawire, Elarabi and Mwanzi, 2009). Kenya like all developing countries, look to Science and Technology for development (Makinde, 2011). If persons with visual impairments who constitute about 1% of Kenya's population (Government of Kenya, 2010) are thus unrepresented in Science and Technology, then Kenya will be lagging behind in the race of development. Integration education system was started so as to allow learners with disabilities to learn together with learners

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without disabilities (Hayes, 1989). According to the Kenya Society for the Blind (2009), the Kenya Integrated Education Programme is an on going project. It began in 1989 in partnership with Kenya Society for the Blind, Sight Savers International and Ministry of Education. Kenya Integratef Education Programme is currently operating in 82 districts covering 19 programmes that target children with visual impairments in mainstream schools where they learn alongside the sighted children (Kenya Society for the Blind,2009).

In 1994, the Low Vision project conducted a survey in six residential special primary schools for the Visual Impairment and in two integrated programmes. The survey established that only about 67% of these Visual Impairment had low vision, 30% were totally blind and 3% did not qualify to be in these schools since they had normal vision (Kimani, 2002). According to 2009 Kenyan Census Statistics, there are 331,594 visually impaired persons; 153,783 males and 177,811 females in Kenya. This represents about one per cent (1%) of the total population and about four percent (4%) of persons with disabilities whose factors related to their performance in various subjects in schools including Mathematics which should be investigated (Government of Kenya, 2010). The child with Low Vision has experiences that are different from the child who is totally blind. Teachers of Mathematics are in unique position to observe and detect unusual characteristics in a learner with Learners Vision. This is because the classroom setting is the one where children concentrate in a variety of tasks requiring both near and distance visual skills (Rukwaro and Kimani, 2007).

The relationship between attitudes and performance is reciprocal (Aiken, 1970). Attitudes affect performance and performance affects attitudes. He refers to this relationship as a dynamic interaction between feeling and behaviour as observed in performance. Literature underlines that primary teachers often have negative attitudes towards Mathematics (Pezzia and Martino, 2011). Kenya' s Ministry of Education Inspectorate

Report (1988) on improving Sciences teaching in schools and colleges identified negative attitudes towards Mathematics as one of the causes of poor performance in Sciences and Mathematics. Teachers play an important role in helping to adjust learners' handicap and in assisting the other children to accept it either through personal example or modifying attitude more directly (Ndirangu, 1996). Moreover, mastering Mathematics can be daunting for many children, but researchers have found that children with visual impairments face disproportionate challenges learning Mathematics and by the time they reach the college level, they are significantly under-represented in science and technology disciplines (Science Daily, April 16, 2010).

Although there is no standard definition of the term attitude, in general, it refers to a learned predisposition or tendency on the part of an individual to respond positively or negatively to some object, situation, concept or another person (Aiken, 1970). According to Njoroge (1991), for integration programmes to function effectively for the benefit of students with VI in the regular schools in Kenya, the regular education teachers will play a dominant role in assisting both academic and social success of these students within the mainstream.

#### **Literature Review**

Adera (2004) carried out a study to investigate attitudes of form four students towards Mathematics as a subject in regular public secondary schools and their academic performance in selected schools in Nairobi Province. The study found out that the attitudes of students in regular public secondary schools affected performance as a subject. He also found out that majority of form four students were aware of what they needed to do in order to pass Mathematics, but they still did not perform well. His key recommendation was that students needed to be exposed to peers (especially those from good performing schools) through symposiums and teachers to be exposed to seminars and in-service training. Njoroge (2011) found out those learners that learners in regular classes in class six in Nairobi County had negative attitudes towards



Mathematics. Throughout the history of the society, disability had been viewed as a contentious issue where the role of cultural values and norms in the development of attitudes had been crucial (Hodkinson & Vickerman, 2009).

Bottom (1983) conducted a study in the United State of America based on Physics. He stated that attitudes influence cognitive learning. His study compared physics students who liked Physics with those who disliked it. The result of the study indicated that those who disliked Physics tended to perform poorly as compared to students who disliked the subject. The researcher stated that when students' attitudes are negative towards a particular subject, teachers and everybody concerned with teaching of the subject should examine and carefully appraise the situation.

According to Chorolambous, Panaoura and philippou (2008), abstract scholars and teacher educators alike agree that, teachers' beliefs and attitudes towards Mathematics are the key informants of teachers' instructional approaches. They further noted that, in addition to enhancing pre-service teachers' knowledge, teacher education programmes should also create opportunities for prospective teachers to develop productive beliefs and attitudes toward teaching and learning of Mathematics.

Despite Mathematics being an important subject in our life, many children who are Visual Impairments leave class eight and even some drop out before completing primary cycle without any Mathematics skills required for life interactions. These Mathematics skills include; problem-solving, computation, communication, manipulative and thinking skills to name but a few. To add on to this, many of these pupils who finish their primary school level have no one to follow them up. Thus they end up in the streets begging in order to eke out their living. In light of the foregoing background, this study sought to address factors that influence performance in Mathematics among learners with Low Vision at Kilimani and at Our Lady of Mercy Shauri Moyo

integrated public primary schools in Nairobi County for the purpose of increasing their educational and vocational opportunities.

### **Purpose Of The Study**

The purpose of the study was to determine attitudes of learners with Low Vision towards learning Mathematics in integrated public primary schools in Nairobi County, Kenya.

### **Research Methodology**

The researcher adopted a descriptive survey design to collect data. A descriptive survey design was deemed appropriate for the study because it enabled the researcher to collect information with ease regarding the attitudes of Mathematics learners with Low Vision towards learning Mathematics in integrated public primary schools from Nairobi County using questionnaires. A descriptive survey is a method of collecting information about people's attitudes, opinions, habits or any of the variety of education or social issues (Orodho, 2010).

The study was conducted at Kilimani and at Our Lady of Mercy; Shauri Moyo integrated primary school programmes. Nairobi County has three (3) integrated public primary schools for children who are visually impaired (Kenya Society for the Blind, 2009). The target populations for the study were all learners with Low Vision without other disabilities in classes four to eight in the two integrated public primary schools in Nairobi County.

Kombo and Tromp (2006) note that, the power of purposive sampling lies in selecting information rich cases for in-depth analysis related to the central issues being studied. Hence, the two integrated public primary schools were selected using purposive sampling due to the fact that the statistics from the City Education Officer in Nairobi showed that they had registered the highest number of learners with Low Vision. From the sampled schools, all the twenty (20) learners with Low Vision without other disabilities from classes four to eight were selected as the dataset was small.

The researcher read through completed questionnaires



noting any response that was not applicable. Quantitative research was analyzed using the statistical analysis software (Statistical Package for Social Sciences, SPSS Version 11.0 for windows). The data was analyzed using descriptive statistics; mean, standard deviations, tables, frequencies and percentages. To determine whether learners' attitude towards Mathematics differed across gender and whether parents' level of education had an impact towards pupils' attitude in Mathematics the researcher used Chi-square tests.

## RESULTS AND DISCUSSION

### Demographic characteristics of learners

The study comprised 20 learners with Low Vision without additional disabilities from two selected integrated public primary schools in Nairobi County. Of the 20 learners without additional disabilities who participated in the study, 13 (65.0%) were males while 7 (35.0%) were females. Table 1.1 illustrates that 6 (30%) learners were aged between 8 – 11 years, 13 (65%) were aged between 12 – 15 years while 1 (5.0%) was above 15 years.

**Table 1.1: Age of learners with low vision by years**

Age	Frequency	Percent
8 - 9 years	2	10.0
10 - 11 years	4	20.0
12 - 13 years	5	25.0
14 - 15 years	8	40.0
16 - 17 years	1	5.0
<b>Total</b>	<b>20</b>	<b>100.0</b>

Mean= 12.65

The findings indicated that the mean age of learners with Low Vision was 12.65 with the youngest at 8 years and the oldest at 17 years. The age range of 14-15 was the mode or most frequent, representing 8 learners with Low Vision. It may be assumed that learners with Low Vision

had begun school late due to late diagnosis of the disability. It may be also assumed that several learners had repeated classes because Kenya Certificate of primary Education candidates should be within a mean age of 13 years. However, Bala and Bhaskara (2004) indicated that, learners with Low Vision are noted to be retarded by at least one to two years and are found to be under-achievers, vision impairment being the main factor for slower acquisition of information by observation. Table 1.2 shows classes in which respondents were.

**Table 1.2: Classes for respondents**

	Frequency	Percent
Std 4	7	35.0
Std 5	6	30.0
Std 6	4	20.0
Std 8	3	15.0
<b>Total</b>	<b>20</b>	<b>100.0</b>

Table 1.2 shows that 7 (35.0%) pupils were in class 4, 6 (30.0%) were in class 5, 4 (20.0%) were in class 6 while 3 (15.0%) were in class 8. The findings indicated that class 4 had the highest number and class 8 had the lowest number of learners with Low Vision, thus the number decreases as the level of education increases. The opinion of the researcher is that, learners with Low Vision dropped out before completing primary school cycle without acquiring any Mathematical skills required for life interactions because of teachers forcing them to repeat classes. Besides, they may have dropped out because of lack of proper guidance on importance of education in their life, thus ending up in the streets borrowing to eke out their living. Table 1.3 shows learners responses on their parents' level of education

**Table 1.3: Level of education**

	Father		Mother		Guardian	
	F	%	F	%	F	%
Primary level	2	11.8	2	10.5	0	0.0
Secondary level	12	70.6	13	68.4	1	100.0



University/coll ege level	3	17.6	4	21.1	0	0.0
<b>Total</b>	<b>17</b>	<b>100.0</b>	<b>19</b>	<b>100.0</b>	<b>1</b>	<b>100.0</b>

**Attitudes of learners with low vision without additional disabilities**

Attitude refers to a learned predisposition or tendency on the part of an individual to respond positively or negatively to some object, situations, concept or another person (Aiken, 1970). To address this objective, learners with Low Vision without additional disabilities were presented with 7 items based on their attitude towards Mathematics. They were required to state their agreement levels on a Five-point likert scale ranging from strongly agree to strongly disagree. Table

Table 1.3 shows that 70.6% of the pupils indicated that their fathers had secondary school level of education while 17.6% indicated they were university/college graduates. However, 68.4% of them reported their mothers had secondary education 21.1% indicated they had university/college qualifications. This implies that most of the parents’ had attained Secondary school level of education.

1.4 shows responses obtained.

**Table 1.4: Learners preference on Mathematics subject**

Statement	SA		A		UN		D		SD		M	Std Dev.
	F	%	F	%	F	%	F	%	F	%		
Pupils who do well in Mathematics are respected	9	45.0	2	10.0	7	35.0	2	10.0	0	0.0	3.90	1.119
Mathematics is boring	6	30.0	9	45.0	0	0.0	5	25.0	0	0.0	3.80	1.152
It is interesting to do number problems	1	5.0	9	45.0	3	15.0	3	15.0	4	20.0	3.00	1.298
Mathematics helps me learn and think better	0	0.0	2	10.0	14	70.0	0	0.0	4	20.0	2.70	0.923
It is fun to work out Mathematics	1	5.0	3	15.0	0	0.0	15	75.0	1	5.0	2.40	0.995
Mathematics is my favourite subject in school	0	0.0	4	20.0	2	10.0	4	20.0	10	50.0	2.00	1.214
It is interesting to do word sums	0	0.0	1	5.0	1	5.0	10	50.0	8	40.0	1.75	0.786

**Key:** Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D), Strongly Disagree (SD)

Table 1.4 shows that the mean scores obtained by learners on preference of Mathematics ranged between 3.90 and 1.75. The mid-point of the scale was 3 in which scores above 3.5 denoted that learners agreed with the statement,

above 2.5 but less than 3.5 denoted undecided while mean scores below 2.5 denoted learners disagreed with the statement. The statements that the learners with Low Vision agreed with were: Pupils who do well in



Mathematics are respected and Mathematics is boring. This implies that, although learners had a positive attitude towards Mathematics, they viewed the subject as boring. The statements that the learners with Low Vision disagreed with were: It is interesting to do word sums, Mathematics is my favourite subject in school and it is fun to work out Mathematics. This was an indication of negative attitudes towards Mathematics. On the statements, ‘ Mathematics helps me learn and think better’ and it is interesting to do number problems, the learners with Low Vision (70%), were undecided. This is an indication that respondents may be lacking proper guidance regarding importance of Mathematics.

Based on the findings above, it emerged that learners with Low Vision in the selected integrated public primary schools in Nairobi County had negative attitudes towards learning Mathematics. These results agreed with that of Njoroge (2011) who found out those non-disabled learners in class six (6) in Nairobi County had negative attitudes towards the subject. Thus, negative attitudes of these learners may have led them to perform poorly in Mathematics. Further, Adera (2004) stated that, attitudes towards Mathematics affect performance as a subject. From these studies, it can be viewed that, regular learners and learners with Low Vision in integrated primary schools in Nairobi County had negative attitudes towards the subject. The knowledge of Mathematics is needed at every step or stage of life and it is possible to do without the knowledge of our mother tongue, but life becomes a hell without knowledge of calculation (Sudhir and Ratnalikar, 2003).

To verify the above findings, Chi-square test was conducted based on learners preferences on Mathematics across gender. The results of the analysis are presented in Table 1.5.

**Table 1.5: Pupils’ attitude towards Mathematics across gender**

Gender	Attitude	Total	Chi-square statistic

	Negative	Neutral	Positive		$\chi^2=2.136$
Male	7	5	1	13	df=2
Female	6	1	0	7	
<b>Total</b>	<b>13</b>	<b>6</b>	<b>1</b>	<b>20</b>	Sig.=0.344

Not significant at  $p<0.05$

Based on the Chi-square test, the result revealed that both male pupils and female pupils did not differ significantly, at  $p<0.05$  on their attitudes towards Mathematics. In particular, 7 males and 6 females had negative attitudes towards Mathematics whereas 5 males were averaged. This implies that pupils had negative attitudes towards Mathematics. Primary Mathematics syllabus states that all learners should develop positive attitudes towards Mathematics and make use of their leisure time (KIE, 2002).

To determine whether parents’ level of education had an influence towards pupils’ attitudes in Mathematics, the researcher conducted chi-square test on pupils’ attitude towards Mathematics across fathers’ and mothers’ level of education. Table 1.6 and 1.7 shows the results obtained.

**Table 1.6: Pupils’ attitude on Mathematics across fathers’ level of education**

Fathers’ level of education	Attitude			Total	Chi-square statistic
	Negative	Neutral	Positive		
Primary level	1	1	0	2	$\chi^2=3.503$
Secondary level	9	2	1	12	df=4
University level	1	2	0	3	
<b>Total</b>	<b>11</b>	<b>5</b>	<b>1</b>	<b>17</b>	Sig.=0.477

Not significant at  $p<0.05$



As shown in Table 1.6, Chi-square test results indicated that pupils attitudes towards Mathematics and fathers' level of education did not differ significantly at  $p < 0.05$ . The results revealed that among 11 pupils with negative attitudes, 9 reported their fathers had attained secondary education with only 1 indicating university education level. This shows that parents' level of education did not influence learners' attitudes in Mathematics.

**Table 1.7: Pupils' attitude in Mathematics across mothers' level of education**

Mothers Level of education	Attitude			Total	Chi-square statistic
	Negative	Neutral	Positive		
Primary level	2	0	0	2	$\chi^2=2.383$
Secondary level	9	3	1	13	df=4
University level	2	2	0	4	Sig.=0.666
<b>Total</b>	<b>13</b>	<b>5</b>	<b>1</b>	<b>19</b>	

Not significant at  $p < 0.05$

Table 1.7 illustrates that pupils attitudes towards Mathematics and mothers' level of education did not differ significantly at  $p < 0.05$ . Specifically, the result shows that 9 pupils with negative attitudes indicated that their mothers had attained secondary education as their highest qualifications while 2 reported primary education level. However, 1 pupil with positive attitude reported his/her mother had attained secondary education.

In addition to the results above, Chi-square test was conducted on pupils' attitudes in Mathematics across guardians' level of education. The result obtained revealed that only one pupil was taken care of by a guardian and hence no statistics are computed because guardian level of education and attitude are constants. The results findings from Table 1.6 and Table 1.7 above therefore imply that parents' level of education influenced pupils' attitudes towards Mathematics.

### CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study as summarized above, it can be concluded that pupils had negative attitude towards he learning Mathematics. The study established that pupils' attitude did not differ across gender and also that parents' level of education had an influence towards pupils' attitude in academic performance. Education is viewed as the shared responsibility of the home and the school. Parents' level of education had a profound effect towards pupils' acquisition of attitudes. This is because educated parents understand what a child likes, dislikes, interests and skills needed and therefore could be able to change the attitude of the children either positively or negatively.

Based on the findings of this study, the following recommendations are made:-

- The Kenya government through the MOE, NGOs and parents to give priority towards the provision of adequate instructional materials for teaching and teachers should be in-serviced in the use of individualized education programme.
- A fund be set aside for modifying the environment by the government and be increased in all integrated public primary schools. This will ensure that the learner with Low Vision has positive attitude towards Mathematics subject.
- Due to limited scope of this study, the researcher was not able to carry out extensive research. However, it is hoped that the study will pose a challenge that would lead to further research in the area of Science subjects in integrated public primary schools.

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