

1 Performance of Learners with Visual Impairment in Summative 2 Evaluation in Special Schools in Kenya

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7 **Abstract**

8 Vision is the most crucial sense among the five senses. Almost 80 percent of all learning is
9 achieved through the visual channel. Good vision is therefore paramount for learners to reach
10 their academic potential. Lack of it can negatively affect how a learner performs in
11 examinations. Available studies have looked at the performance of learners with visual
12 impairment in specific subjects. The aim of the study was therefore to explore the general
13 performance of learners with visual impairment in summative evaluation in special schools in
14 Kenya. A survey design with qualitative research method was adopted. Examination results
15 from four special schools for learners with visual impairment were analyzed and in addition, a
16 questionnaire was used to solicit more information from teachers who taught the classes under
17 study. Descriptive statistics were used to analyze data and findings were presented in tables
18 and percentages. Findings indicated that; learners with visual impairment generally
19 performed poorly in examinations. Mathematics and sciences were the worst done at
20 secondary school level where as Kiswahili and Social studies were the two worst performed at
21 primary school level.

22

23 **Index terms**— visual impairment, summative evaluation, braille, KICD, KCPE, KCSE, KNEC, NACOSTI.

24 **1 Introduction**

25 Education is accepted all over the world as the core of national development and a major factor in the utilization
26 of human resources to the fullest. Education is important in that it does not only help people to improve their
27 lives but also makes them self-independent, in addition to acting as a platform to prove the equity by defeating
28 all barriers, including those imposed by disability. Education is the best investment for the people because well
29 educated people have more opportunities to get a job which gives them satisfaction. Egunyomi (2006) observed
30 that Education is universally recognized as the main key to sustainable development and helps in improving
31 human welfare. Through education, individuals, including those with disability, gain strength of mind and
32 opportunity to be independent, so education is not a preserve of individuals without disabilities alone. Thus,
33 education would enable a person with disability to transform from life of complete isolation and social neglect to
34 emerge as self-supporting, economically independent and useful member of the society.

35 All learning takes place through the five sensory channels. Among the sense organs, the eye is considered a very
36 important sensory organ which accounts for a large fraction of total information available. Vision and learning
37 are very closely related. Experts agree that about 80% of what children learn in school is information presented
38 through vision. Therefore, good vision is paramount for learners to reach their full academic potential. Loss of
39 vision is likely to impact negatively on a student's educational achievement. Owing to this, intervention becomes
40 very handy to ensure that learners with loss of vision are not disadvantaged in their education. Early intervention
41 is the first step towards making it possible for children with visual impairment to have equal opportunities with
42 their sighted peers. Failure to give early intervention services to these children may lead to their developmental

2 FIGURE 1: ENGLISH BRAILLE ALPHABETS

43 vulnerabilities in motor, cognitive, language, social and also attention domains including the risk of developmental
44 setback.

45 One of the intervention strategies is availing the relevant communication medium to these students which in
46 this case is Braille. Braille is a tactile system of reading and writing used by persons with visual impairment.
47 Braille entails use of raised dots as shown in figure ???. The dots are used to form different combinations which
48 represent words and other signs which are read through touch by persons with visual impairment or through
49 sight by those with vision.

50 2 Figure 1: English Braille Alphabets

51 It is through Braille that learners with visual impairment interact with their academic work including sitting for
52 their examinations. Most children with visual impairment require extra support in order for them to succeed
53 in school. This is in an attempt to establish a level ground with their peers who have vision. Despite the
54 overwhelming evidence about the importance of early intervention for learners with visual impairment, such
55 services are not available in African countries; instead, children with visual impairment are admitted to school
56 with no additional support or service. This is likely to cause some limitations in their learning and yet they are
57 later subjected to the same examinations with their sighted counterparts.

58 In Botswana, a study by Habulezi and Kefilwe (2017) found that students with visual impairment in senior
59 secondary schools performed dismally in science subjects. Out of the 8 students with visual impairment who sat
60 the examination in the year 2014, in the school under study, only 2 (25%) passed. The remaining 6 (75%) failed.
61 In the following year, 2015, 11 students with visual impairment sat the examination and out of the 11, only 1
62 (9%) passed. The remaining (91%) failed. In the year 2016, out of the 9 students with visual impairment who
63 sat the examination, none passed in science subjects. All the 9 (100%) failed.

64 In the Kenyan context, a study by Bisi (2013) indicated that performance of students with visual impairment in
65 Kiswahili in the three colleges that offer Primary Teacher Education and admit students with visual impairment
66 (Asumbi, Machakos and Mosoriot Teachers colleges) was very low. Out of the 17 students with visual impairment
67 who sat the PTE Examination in the three colleges in 2009, 7 (41%) failed, in 2010, 13 (44%) out of the 26 students
68 failed and in 2011, 13 (44%) students out of the 29 who sat Kiswahili that year failed ??KNEC, 2012). No study
69 is available to show the performance of these students in the other subjects offered in the Primary Teacher
70 Education or their general performance at primary and secondary school levels of education and yet their mode
71 of learning and sitting examinations is quite different from that of their sighted peers.

72 Summative evaluations in education in this case are assessments that are used to evaluate students' learning
73 at the conclusion of a defined instructional period. Students' learning is compared against some benchmark
74 or standard with an aim of assessing what they have learned. The evaluation focuses on the outcome of a
75 programme. These evaluations are generally evaluative rather than diagnostic (Abbott, 2014). Saima and Qadir
76 (2011) further observed that examinations are useful as they measure a student's progress towards predetermined
77 objectives. Learners are subjected to evaluation through examinations at various stages of their learning.

78 In Kenya, learners are subjected to summative evaluation after eight years of primary education and four
79 years secondary education and also at tertiary level. The Kenya National Examination Council (KNEC) is
80 the main examining body in Kenya. KNEC controls examinations, ensuring their validity and reliability, and
81 also ensuring conformity to Kenya's goals and changes in Government policy relating to the curriculum and
82 examinations (KNEC, 2013). The two main examinations controlled by KNEC are the Kenya Certificate of
83 Primary Education (KCPE) and the Kenya Certificate of Secondary Education (KCSE).

84 The Kenya National Examination Council is mandated to prepare the examination papers for candidates who
85 are blind in Braille. In order for learners with special needs in education to benefit from the education system
86 in Kenya, KNEC has found various ways and means in which assessment for these learners can be made more
87 adaptable to their needs through differentiation, adaptation and modification of its examination and examination
88 management. The examinations are norm referenced. The Kenya National Examination Council develops or
89 adapts examinations using the adapted curriculum by the Kenya Institute of Curriculum Development (KICD).
90 Where such curriculum does not exist, the learners are left to fit within the regular curriculum. Candidates with
91 visual impairments take the regular examinations but in Braille for those who are blind and large print for those
92 with low vision. Differentiation is made in adaptations which are made in certain questions that require sight
93 e.g., in Mathematics, Biology, Geography and Home science. Certification requirements are also waived for
94 candidates who are blind by exempting them from taking a second science subject which is a requirement for
95 other candidates. On time allocation, an extra thirty minutes is given in all subjects.

96 In Kenya Certificate of Secondary Education Examination, map reading and diagrams used in Geography
97 use symbols with texture which is felt by touch to enable the learners with visual impairment arrive at correct
98 interpretation ??KNEC, 2013). The council has a grading system that it uses in measuring the performance in
99 KCPE and KCSE examinations by candidates. In KCSE, the grading is as follows (grades are from A -E in a
100 strength scale of 12 down to 1 point respectively). A (80% and above), A-(75 -79), B+(70-74), B (65-69), B-
101 (60)(61)(62)(63)(64), C+ (55)(56)(57)(58)(59), C (50-54), C- (45)(46) ??47)(48)(49), D+ (40)(41)(42)(43)(44),
102 D (35)(36)(37)(38)(39), D- (30)(31)(32)(33)(34) and E (0-29). The grading applies both for the subjects'
103 performance and the learners' mean grade (KNEC, 2013). Examinations offered by KNEC are terminal,
104 summative and their main purpose is for selection, placement and certification.

105 3 II. Performance of Learners with Visual

106 Impairment in Mathematics and Science Subjects

107 Fraser and Maguvhe (2008) observed that conceptual development and abstract thinking for learners with
108 visual impairment may be delayed due to the absence of graphical stimulus or imageries. Therefore, since greater
109 parts of science representations are visual, learners with visual impairment frequently face educational challenges.
110 This is likely to be due to the fact that some teachers lack appropriate teaching and learning strategies for learners
111 with visual impairment. Kapperman and Sticken (2004) observed that many people with visual impairment
112 encounter challenges in performing mathematical operations in real-life situations mostly due to the visual nature
113 of mathematics. In addition, delay in development of concepts which are needed in understanding mathematics
114 and also lack of the required knowledge by teachers to be able to teach learners with visual impairment contributed
115 to poor performance in mathematics. According to Clamp (2003), learners with visual impairment are usually
116 slower in acquiring knowledge in mathematics than their sighted colleagues. This could be due to lack of visual
117 stimulation in natural mathematics and also the limiting effects of visual impairment on cognitive function, in
118 addition to the underdevelopment of specific mathematical concepts.

119 In support of this, Kalra, Lauwers, Dewey, Stepleton & Dias, (2009) and Maguvhe (2005) observed that science
120 and mathematics education was less accessible to learners with visual impairment as compared to those with
121 vision. They attributed this to the fact that many concepts in science and mathematics were presented graphically
122 and there were also a number of concepts which could not be explored through touch thus disadvantaging the
123 learners who used touch. Habulezi, Kefilwe, Batsalelwang and Malatsi, (2017) carried out a study on factors
124 influencing the poor academic performance of learners with visual impairment in Science subjects in a senior
125 secondary school in Botswana. The study embraced qualitative research design and used purposeful sampling.
126 They sampled 14 learners and 5 teachers for the study and used interviews, observation and document analysis
127 for data collection. They explored results of students with visual impairment in science from the year 2010
128 through 2016. They found that the performance of learners with visual impairment in science subjects was far
129 below average. Not a single year recorded 50% pass. The best performance was recorded in 2010 and 2013 where
130 percentage pass was at 33%. The other years ranged from 25% down to 0% pass recorded in the year 2016 where
131 all the 9 students who sat the examination failed in science as presented in table 1. These teachers give their
132 students the impression that science subjects are inaccessible due to their absence of vision Maguvhe (2013),
133 while the actual problem is that teachers themselves lacked adequate direct experience in teaching learners with
134 visual impairment (Sahin & Yorek, 2009). Some teachers doubt whether their learners have the capacity to do
135 well in science. However, Kumar, Ramasamy, and Stefanich (2001) asserted that learners with visual impairment
136 have the same cognitive ability just like their sighted counterparts. In order for them to perform on the same
137 level, learners with visual impairment only need appropriate accommodations. In addition, there is availability
138 of necessary technologies that can be utilized to support learners with visual impairment in their science and
139 mathematics education (Sahin & Yorek, 2009). On pedagogical practices, Mwakyeja (2013) also noted that when
140 teachers fail to use teaching methods properly and lack the skills and abilities to work with learners with visual
141 impairment, the learners are disadvantaged as they face numerous challenges in acquisition of education. It was
142 further observed that teachers of learners with visual impairment were not well trained in the use of Braille
143 materials and also in the preparation of tactile diagrams and maps. There also seemed to be a large gap between
144 teachers' perspectives on what learners with visual impairment could do and the availability of resources to
145 support them achieve their full potential.

146 Still on the teaching of science and mathematics, Maguvhe (2013) carried out a study aimed at exploring
147 the role of the teacher in promoting the participation of learners with visual impairment in mathematics and
148 science subjects in South Africa. He embraced a case -focused -study of an individual respondent who had unique
149 characteristics of interest to the researcher. The individual was a technician with visual impairment who drew
150 from his own experiences. A semi structured face -to -face interview was used for data collection. The participant
151 felt that teachers were the primary resource in teaching mathematics and science subjects and therefore they
152 should be well equipped with knowledge, skills, attitudes and values to make them inspire and stimulate learners'
153 interest in sciences. Sahin and Yorek (2009) felt that learners with visual impairment regarded science as a
154 challenging subject due to its abstract concepts and yet the subject depended mostly on visual instruction. The
155 researchers over emphasized the fact that learners with visual impairment needed to rely on their other senses such
156 as touch and auditory in their learning process. ??aguvhe (2013) further noted that teachers lacked motivation
157 and mentorship in mathematics and science in addition to deficiency in methodologies and abilities to use tools
158 in order to empower their learners. Generally, teachers lacked the necessary skills in special education to support
159 learners in realizing their potential in mathematics and science.

160 Under normal circumstance, science and mathematics education is easily accessed by learners with sight while
161 those with visual impairment experience a myriad of challenges in accessing the subjects owing to the fact that
162 most of the concepts are presented in graphics. In addition, there are many concepts which are difficult to explore
163 by touch and are therefore presented through visual observation (Kalra et al., 2009). Sahim and Yorek (2009)
164 observed that in situations where resources have been modified for learners with visual impairment, and the
165 relevant information put across in formats that these learners are able to access, then they perform competitively
166 with their sighted peers. They therefore concluded that learners with visual impairment performed minimally in
167 science due to lack of appropriate access to technologies as opposed to their psychological incapacity. However,

4 III. PERFORMANCE OF LEARNERS WITH VISUAL IMPAIRMENT IN LANGUAGES

168 Maguvhe (2013) was of a different opinion where he asserted that teachers lacked the proper training to enable
169 them teach learners with visual impairment. This finding is supported by Sahin and Yorek (2009) who asserted
170 that many teachers lack experience in teaching learners with visual impairment in addition to scarcity of resources.
171 Further, Catholic Education Office Canberra (2011) observed that most teachers lack confidence in understanding
172 assessment procedures of learners with visual impairment.

173 Malik, Ngban and Ibu (2009) described mathematics as a subject that affects all facets of human life in many
174 ways. However, that notwithstanding, students' performance in mathematics has not ameliorated significantly
175 despite its importance, not even with the introduction and use of technology. In developing countries, the situation
176 might be quite different. For instance, in Nigeria, mathematics has not shown any significant improvement even
177 after the government confirming its importance and making it a core and compulsory subject both at junior
178 and senior secondary levels (Federal Republic of Nigeria, 2004). In developed countries, unlike the developing,
179 schooling resources which may include reduced class sizes, higher teacher salaries, modern equipment and other
180 structures are associated with better student outcomes. On several accounts, mathematics teachers have been
181 judged as the central determinant in the way students perform in mathematics. According to Idowu (2015)
182 teachers are very crucial to the good performance of their students since they are expected to possess the required
183 knowledge important for teaching. In addition, teachers ought to have the ability to impart the knowledge in
184 a way that it results to learning. Soer (2009) added that teachers of mathematics should be in position of
185 communicating the required knowledge in unambiguous, informative and accurate manner to their students.
186 Unfortunately, this is not being done by the teachers for mathematics according to Okafor and Anaduaka (2013)
187 who argued that most teachers are not ready to do anything extra in their teaching.

188 Olalekan (2016) conducted a study in Nigeria on performance of high school students in mathematics. The
189 study embraced use of descriptive survey with a designed questionnaire for data collection. A sample of 287
190 students was randomly selected from two rural secondary schools and subjected to the questionnaire. The
191 findings indicated that overpopulated schools with large classes, unqualified teachers and undesirable spending
192 by the government were the main factors contributing to the poor performance. Partly supporting these findings
193 was Avong (2013) whose study concluded that lack of qualified mathematics teachers was the single most cause
194 of poor performance in mathematics.

195 In their study Osunde and Izerbigie (2006) cited teachers' attitude as another aspect contributing to students'
196 poor performance in mathematics. Overcrowded schools with large classes of studentteacher ratio of up to 100:1
197 is likely to compromise the teaching and learning of mathematics (Umameh, 2011). Sahin and Yorek (2009) in
198 their Turkey study further asserted that it was difficult for teachers who are not specialists to impart the subject
199 matter effectively to learners with visual impairment; it was difficult to achieve maximum participation. Fraser
200 and Maguvhe (2008) argued that learners with visual impairment found it difficult to pursue mathematics and
201 science due to the unavailability of resources in addition to teachers who had problems in imparting the subject
202 matter to their students. So, it is paramount for teachers to have enough knowledge on how their students learn
203 mathematics and the best ways of teaching it (Ruth, Linda, Alethea, Nikole, and Stelios, ??2009).

204 A study by Miheso (2012) in Nairobi County, Kenya examined factors affecting mathematics performance
205 among secondary school students. The study involved a sample of 570 form two students from ten randomly
206 selected secondary schools. Through use of questionnaires, checklists, achievement tests and interviews, the study
207 found that variation in performance in mathematics was significantly influenced by the type of teaching method
208 embraced. There seemed to exist a direct relationship between the learning environment and poor performance.
209 Text book-student ratio was also another factor that affected performance. However, there was no significant
210 difference in performance when the ratio of text books to learners was 1:2 and below. A ratio of 1:3 and
211 beyond seemed to have a negative impact on performance (Miheso, 2012). Another study by Mwangi (2014) on
212 pedagogical challenges which faced teachers of learners with visual impairment a t Thika Primary School for the
213 blind established that learners with visual impairment performed minimally in mathematics in Kenya. The study
214 used descriptive survey design to collect data from both the teachers and the learners. In this study, teachers
215 agreed that mathematics topics were the most difficult to teach to learners with visual impairment. Topics
216 such as measurement, geometry, multiplication and division were identified as the most challenging. On time,
217 about 74% of the teachers felt that the time allocated for both teaching and assessment of learners with visual
218 impairment was not adequate. The study further established that learners with visual impairment were slow in
219 acquiring computational skills and some had challenges in using resources such as the abacus in mathematical
220 computations (Mwangi, 2014).

221 4 III. Performance of Learners with Visual Impairment in 222 Languages

223 The sense of vision is very important in providing information on non-verbal communication in addition to
224 providing meaning to language. The role played by language in learning is very crucial. Being handicapped in the
225 language of instruction for any learner would most probably mean no learning takes place since there won't be any
226 communication between the teacher and the learner ??Malekela, 2003). To help learners with visual impairment
227 to improve on their use of language, it is important that they are provided with many hands -on experiences
228 with real objects together with auditory labels paired with descriptions and a rich literacy environment (Carmen,

229 2019). Kapoli (2001) asserted that learning materials help the learner to make exploration of the language used
230 in day-to-day life which is related to their interests and needs. Still on the issue of teaching/learning materials,
231 Nyamubi (2003) postulated that materials make learning more gratifying to the learner by stimulating their
232 imagination and making learning more real. Tangible foundation for abstract thought is extended by learning
233 materials giving more meaning to word responses.

234 The early years are typically the time when language develops greatly since this is the time when children
235 begin connecting verbal labels and identifying objects. Unfortunately, for children with visual impairment, this
236 opportunity of casually observing and making connections with gestures and materials in their environment
237 is not there. This can only be achieved if the learner with visual impairment is intentionally taught through
238 direct experiences accompanied with language. If this is not done, language development in learners with visual
239 impairment will be undoubtedly delayed. Carmen (2019) cited a number of language problems likely to be
240 found among learners with visual impairment. These are, verbalism; this is where a learner talks about people,
241 objects and events without understanding the concepts at all. This is mostly due to the fact that they have
242 heard people talking about the topics but had no experiences related to the topics themselves. Unless learners
243 with visual impairment are provided with various hands -on experiences then they will definitely experience
244 difficulties understanding the concepts and will have no foundation to build upon. Ramakrishnan (2013) asserted
245 that excessive dependence on verbal learning impacts negatively on both academic learning and also personality
246 development. Ramakrishnan further noted that the absence of vision not only influences but also delays the
247 process of language acquisition. Without vision, the child with visual impairment relies more on auditory and
248 tactful exploration unlike a child with vision who integrates all the senses including vision. Another problem is
249 echolalia; this is where a learner with visual impairment learns to talk by copying words, phrases or sentences
250 from others without attaching any meaning to them (Carmen, 2019). If such problems are not addressed in the
251 early years, it is likely that their effects will be felt later in life and this might determine how such a learner
252 performs in language examinations.

253 The language of instruction in the upper primary and in other post primary institutions of learning in Kenya
254 is English. It is the expectation of everybody that by the time students are through with secondary education,
255 they will have acquired and also developed both spoken and written skills of the language to enable them cope
256 with its demands at higher educational levels and also in the world of work. However, despite the important
257 role that is played by English language, empirical studies have indicated that learners have not been performing
258 well in English language examinations. One such study was carried out by Mosha (2014) in Zanzibar. The
259 study aimed at investigating the factors affecting students' performance in English language subject in secondary
260 schools in Zanzibar. It adopted both qualitative and quantitative approaches and used questionnaires, interviews,
261 classroom observation and documentary review for data collection. The population for the study was made
262 up of both students and their English teachers. The results indicated that students were inspired to learn
263 English language because they recognized its importance in local and international communication and also for
264 employment prospects.

265 However, even with such motivation, students continued performing poorly in the language as indicated in
266 the findings. For instance, in the year 2001, 197 students out of a total of 296 (67%) failed in the subject. In
267 the following year, 2002, the situation was not very different because out of 292 students who sat the English
268 examination, 181 (62%) failed. In the year 2003, 68% of the students failed, and in 2004, the situation got worse
269 with up to 72% failure. The worst was the year 2005 where 78% of the students failed. The trend indicates that
270 the situation was worsening as students continued performing poorer (Mosha, 2014). The findings pointed to
271 a number of factors that continued affecting the performance of the high school students in English language.
272 First, there was a deficit of English teachers and the teaching and learning resources were scarce (Mosha, 2014).
273 The study further found that students were taught by teachers who were not qualified, some other teachers were
274 trained but still they were not competent. In some instance, such teachers resulted to skipping some difficult
275 topics in the syllabus.

276 Other contributing factors to the poor performance of English according to Mosha (2014) included large class
277 sizes and unfavourable teaching and learning environments. Mosha's findings partly corroborated with those of
278 Msanjila (2005) whose study in Tanzanian secondary schools found that learners' poor performance in English
279 examinations was because of the inappropriate methods used by the teachers, inadequate text books and the fact
280 that some teachers were unqualified. Therefore, this would mean that qualities of teachers are among the factors
281 that lead to student' poor performance (Harmer, 2003; ??osha, 2004). In their study ??akeye and Ogusinji
282 (2009) posited that proficiency in English language impacted very significantly on the students' overall academic
283 performance. Moreover, there was a positive notable relationship between proficiency in English language and
284 the general academic achievement. Despite its great impact on the students' general performance, research has
285 indicated that most students perform poorly in it ??Nyamubi, 2003;Yohana, 2012).

286 Students' success in school to a large extent relies on their proficiency in the language of instruction (Fakeye
287 & Ogunsiji, 2009). Harb and El-Shaarawi (2006) postulated that competence in English is a pre-requisite factor
288 that has some positive effect on the student's performance. Moreover, a study by Nara, Eunjin, and Reubenson
289 (2015) found that use of language as a medium of instruction limited the students' academic performance. These
290 researchers used an ex-post facto, non-experimental approach to examine the impact of proficiency in English
291 language on academic performance of international students in a university in the United States of America.

5 RESEARCH METHODOLOGY

292 The population of the study was university students in their junior and senior year of college. The study found
293 that students who were excellently proficient in English had the highest mean GPA of 3.57. Further, the group
294 of students who had indicated that English was their second language scored the lowest mean GPA of 2.68.
295 The conclusion of the study was that self-perceived English proficiency correlated with the students' academic
296 performance. Thus, it was crucial to offer support services to the international students most of which was to be
297 in form of English language courses (Andrande, 2006).

298 A similar study was carried out by Olanipekun, Garuba, Mohammed and Ohiemi (2014) in Nigeria. The
299 aim of their study was to investigate the influence of English language on students' performance in vocational
300 education, majoring on Agriculture, Science and Economics and it adopted a descriptive survey method. The
301 population was derived from graduating students. The results of the study indicated that competency in English
302 considerably determines the students' academic performance. This showed that good mastery of English language
303 is paramount in students' performance in intelligence tests (Olanipekun et al., 2014). Lack of proficiency in
304 English could be among the factors likely to lower the students' performance. Students who experienced difficulties
305 in communication skills in English were likely to underperform not only in English language, but also in other
306 areas of study. In Olanipekun et al. (??014) study, it was evident that students' academic performance in
307 vocational education was influenced by English language. Therefore, the importance of English language as the
308 medium of instruction can never be over emphasized.

309 Among the languages examined in the Kenyan Education system are Kiswahili and English, in the lower grades
310 and foreign languages like German and French in high school. Kiswahili and English are compulsory in both
311 Kenya Certificate of Primary Education (KCPE) and the Kenya Certificate of Secondary Education (KCSE)
312 examinations. Kiswahili is looked at as a key subject in career development (Bisi, 2013). It affects the career
313 choices of students, for example for one to join primary teachers' training colleges one has to score a minimum of
314 grade C in either Kiswahili or English. ??kombo (2002) asserted that governments' policies on schooling, national
315 language and mass media of communication all in a way affect the people's career prospects and also their cultural
316 life. That is to say, whatever is done in the classroom has some consequences in life after school. According
317 to Maina (2003) children are introduced to Kiswahili early enough and they learn it with ease. Once they are
318 exposed to the language early, they learn it with no problem and they become bilingual. However, in Kipipiri
319 division of Nyandarua county Maina (2003) found that learners consistently performed poorly in Kiswahili. The
320 researcher looked at the performance of secondary school students in Kiswahili in their KCSE examination for
321 five consistent years starting in 1998 through 2002. The study used descriptive survey and targeted form four
322 students and their Kiswahili teachers.

323 The study revealed that performance in Kiswahili during the five years under study was quite low. Most
324 schools under study recorded a mean score of C's over the years under study. In 1998 and 2001, the mean grade
325 was C-, in 1999 and 2000 the mean grade was D+ and the best performed year was 2002 where the mean grade
326 was a steady C (Maina, 2003). The findings indicated that learners lacked resources and in some cases the
327 resources available were inadequate. Areas highlighted as the most challenging to learners thus contributing to
328 poor performance were, poetry, Kiswahili grammar, composition, vocabulary and literature in Kiswahili. The
329 finding supported ??inyanjui (2006) who stated that poetry in Kiswahili was found to be the most difficult part of
330 literature to understand and quite a number of students do not like studying it. Some students felt that 'mashairi'
331 (Poetry) was a foreign aspect of literature and had no direct relationship to their day-to-day lives. Cole and
332 Chan (2000) further argued that most teachers held negative attitude towards Kiswahili and unfortunately this
333 attitude is passed on to their learners.

334 According to Curran and Rosen (2006) attitude affects achievement. This would then mean that once students
335 have negative attitude towards Kiswahili, their preparation in it would be poor, thus, yielding poor results.
336 This being the case then, teachers are supposed to be good mediators and portray a positive attitude towards
337 the subject so that students can have similar attitude and achieve their full potential. Learners with visual
338 impairment would need more support of modified school practices and services to assist them develop their full
339 potential and perform as well as their sighted counterparts. As AFB (2007) asserts, instruction for learners with
340 visual impairment should be provided by teachers who are well qualified and prepared to impart knowledge and
341 skills in the best way possible. If this is not done, then it is highly likely that performance of learners with
342 visual impairment in Kiswahili will continue being poor. Unfortunately, no study has been done to establish
343 performance of learners with visual impairment in humanities like history and geography.

344 IV.

345 5 Research Methodology

346 The study adopted a qualitative study design to explore performance of learners with visual impairment in
347 summative evaluation. Four special schools for learners with visual impairment in Kenya were used for the study.
348 Results for the Kenya certificate of secondary education and Kenya certificate of primary education for the year
349 2017 were analysed. Further, results for the year 2013 through 2016 were also explored. To supplement data
350 collected through document analysis, a questionnaire was used to collect more data from the teachers. The
351 questionnaire sought to find out whether there were topics that teachers felt were challenging to teach learners
352 with visual impairment. It also focussed on soliciting information on challenges emanating from the whole
353 examination process.

354 Consent to carry out the study was obtained from the National Commission for Science, Technology and
355 Innovation (NACOSTI) through graduate school, Kenyatta University. The four schools under study were visited
356 and after getting permission from the head teachers, the questionnaires were administered to the teachers who
357 taught class eight and form four. Results for the years under study were also acquired.

358 V.

359 **6 Data Analysis**

360 The collected data was edited, coded, categorized and classified according to its origin. The classified data
361 was then put in tabular form. The examination results were analysed and presented through frequencies and
362 percentage distributions. The tabulation helped to give a comprehensive picture of what the data looked like.
363 Explanations were also given in relation to reviewed literature.

364 **7 VI.**

365 **8 Findings and Discussions a) Student's performance in 2017 366 KCPE in the schools**

367 In their KCPE performance, the learners' mean marks obtained in English, Kiswahili, Mathematics, Science
368 and Social Studies were established in the two schools (St. Francis and Kibos Primary schools for learners with
369 visual impairment). Performance in Thika High school and St. Lucy's secondary schools for learners with visual
370 impairment in KCSE was equally evaluated. Analysis of the learners' mean performance in KCPE per subject in
371 the two primary schools indicated that the learners performed minimally in all the subjects. It can be observed
372 that not a single subject attained the average mean score of 50 and above. The highest mean score achieved in
373 subjects was 35.67 in English in school 2 and 35.33 in Mathematics in school 1, a deviation of 14.33 and 14.67.
374 The two lowest mean scores were 31.00 and 29.58 from the two schools respectively. Total mean scores posted
375 for the five subjects from the two schools were 167.5 from school 1 and 158.17 from school 2. This indicates that
376 the performance in the two schools was indeed low. Results for the years preceding 2017, that is 2013 through
377 2016 indicated some improvement in the performance as observed in Figure 2. However, the improvement was
378 not very significant though because it was only school 1 which managed an above average mean score in the year
379 2016. Both schools posted below average scores for the other three years 2013, 2014 and 2015. AGR 0 0 0 0 0 0
380 1 2 2 3 3 0 0 FRENCH 0 0 0 0 0 0 0 0 1 0 0 0 0 MUSIC 0 0 0 0 1 1 1 0 0 3 1 0 0 B/ST 0 0 0 0 1 0 0 1 0 3 1 1
381 0 Table 4: Learners' performance in 2017 KCSE in High school 2 Subject A A- B+ B B-C+ C C-D+ D D- E F
382 ENG 0 0 0 0 0 0 1 1 0 2 2 3 0 KIS 0 0 0 0 0 0 0 1 2 2 3 1 0 MATHS 0 0 0 0 0 0 0 0 0 0 0 9 0 BIO 0 0 0 0 0 0 0 0 0
383 0 0 5 4 0 HIST 0 0 0 0 0 1 1 4 0 1 1 1 0 C.R. E 0 0 0 0 0 1 1 2 0 3 1 1 0 GEO ----- H/SCI 0 0 2 0
384 0 1 0 1 1 3 1 0 0 AGR 0 0 0 0 0 0 0 0 0 0 1 2 0 FRENCH ----- MUSIC 0 0 0 0 0 0 0 0 0 1 1 0
385 B/ST 0 0 0 0 0 0 0 0 0 0 4 0 0 Source: KNEC (2018)

386 The tables indicate that the performance across subjects was rather low. Home science had the highest grade
387 of C+. Performance in English, Kiswahili, CRE, History, Agriculture and Business Studies was the same where
388 the mode posted by all the six subjects was a D while Biology had a D-. Mathematics had the lowest mode
389 which was Grade E. The tables also indicate that the best grades posted by individual students were in history
390 and CRE. Majority of the students in high school I managed to score Grade C and above in history where two
391 students scored grade A and a further 2 scored grade A-. Two students managed a B+ and another 4 students
392 got grade B. 4 students scored a B-, 2 got a C+ and 6 got grade C. Interestingly, the situation was completely
393 different in high school 2 where the best score in the same subject was a C+ posted by one student only and
394 another 1 student posting grade C, all the other students in this school scored grade C-and below in history. In
395 C.R.E two students in school 1 managed to score grade A-. Another 4 scored a B+, six scored B and the same
396 number got a B-. One had a C+ and another 3 posted a C. Just like in history, the situation was different in
397 high school 2 where the best score was a C+ posted by a single student and another one scored grade C. All the
398 other seven in this school scored C-and below. In English, 8 students managed to score grade C and above in
399 school 1 while in school 2 only one student scored grade C. All the others had grade C-and below.

400 Kiswahili was not very different since 13 students scored grade C and above in school 1 and just like in English,
401 school 2 had a single student scoring grade C while all the others scored grade C-and below. French was done
402 by a single student in school 1 who scored a D+.

403 Mathematics was the worst performed subject where in school 1 a single student managed to score grade B
404 and all the others scored grade D-and below, with the majority scoring grade E. Interestingly all the students in
405 school 2 scored grade E in mathematics.

406 **9 c) KCSE points obtained in the two schools in respective 407 subjects**

408 In KCSE grading A -E (points A =12, A-=11, B+ =10, B =9, B-=8, C+ =7, C =6, C-=5, D+ =4, D =3, D-=2
409 and E = 1), the points obtained in each of the subjects were added up to establish which of the subjects learners
410 with visual impairment scored the highest points in the two high schools in that year. In the first school, the best

9 C) KCSE POINTS OBTAINED IN THE TWO SCHOOLS IN RESPECTIVE SUBJECTS

411 performance was therefore recorded in C.R.E where the school had a total of 263 points. Similarly, in the second
412 school; the best performance was in C.R.E where the learners scored a total of 149 points. Using descriptive
413 statistics, mean performance, the learners performed well in C.R.E (mean points 149). Considering the number
414 of learners who attempted the various subjects, in school 1, the best subject, C.R.E scored a mean point of 5.98
415 while in school 2 the best performance was in Home science which had a mean of 5.22 points. In both the schools
416 1 and 2, the lowest points were recorded in Mathematics (1.50 and 1.00 respectively, and an average of 1.25).

417 The average performance of the two schools was therefore established as shown in table 6. The table indicates
418 that the mean for the two schools for the particular year was 3.528. Home science was the best performed (mean
419 point 5.51) followed by geography (mean point 5.30). On the other hand, mathematics was the worst performed
420 subject with mean point of 1.25, followed by biology (mean point 1.7). The performance in all the schools was
421 generally below average.

422 The teachers were asked to explain whether there were some topics that proved difficult to teach those learners
423 with visual impairment. Most of them agreed that they faced a number of challenges in teaching a number of
424 concepts particularly in math and sciences.

425 Poor performance by learners with visual impairments in mathematics has been confirmed by a number
426 of researchers. The worst scenario in the current study was the results posted by school 2 in 2017 KNEC
427 examination where all the learners scored grade E. Grade E in the KNEC examination is considered the lowest
428 grade a learner can score in a subject or in their overall performance. This finding supports Schleppenbach (1997)
429 who reported that mathematics was a field considered inaccessible to learners with visual impairment because of
430 the presentation of its concepts and information. Schleppenbach (1997) further noted that only a few educators
431 are prepared adequately to teach mathematics to learners with visual impairment, thus the poor performance.

432 The fact that mathematics is usually taught using the 'chalk and talk' method which basically focuses on
433 what the teacher is saying and the examples worked out on the board, makes it quite a challenge to learners
434 who are not able to see and follow the demonstrations, and the subsequent development of the concepts on
435 the board. This finding on poor performance in mathematics by learners with visual impairment also supports
436 Cliffe (2009) who reported that taking in a lot of information, and trying to conceptualize huge amounts of
437 spoken mathematics without reference to what is being developed on the board or written notes could place high
438 demands on memory. Such a situation could be made worse by the ambiguity of spoken words particularly when
439 teachers of mathematics use gestures and phrases like 'this equation' or 'this plus this' which the learner with
440 visual impairment cannot see ??Rowlett & Rowlett, 2012;Cliffe, 2009).

441 The issue of time could also be a contributing factor to poor performance in mathematics. Time was reported
442 as an issue by majority of the teachers in the current study who observed that mathematics papers should be given
443 more time since the current time was not adequate, even with the additional thirty minutes. They attributed
444 this to the many activities and long processes that candidates with visual impairment involved themselves in
445 before arriving at the answers. This included reading the questions, arranging the calculation tools (cubes and
446 cubararithms) and getting back to the Braille writer to arrange the process on paper. This finding supports Gross
447 (1995) who noted that computation by learners with visual impairment usually took a lot of time as compared
448 to the way learners who use sight work out the same mathematical questions.

449 Lack of proper accommodations could also be another reason why learners with visual impairment in the
450 current study posted a minimal performance in mathematics. It was reported that diagrams adapted by KNEC
451 were quite difficult to interpret. The teachers also noted that mathematics papers were full of diagrams and
452 learners with visual impairment took a lot of time trying to read and interpret the diagrams tactually. However,
453 the finding on minimal performance in mathematics contrasted with Lynn (2012) who found a consistent high
454 percent of learners visual impairment getting high scores in mathematics across grade levels and years in her
455 study. This good mathematics performance by learners with visual impairment as confirmed by Lynn (2012)
456 countered a theory and misconception by Ferrel, Buertel, Sebald and Pearson (2006) and Kapperman and Sticken
457 (2004) that performance in mathematics by learners with visual impairment had always been poor as a result of
458 the visual-spatial and abstract nature of mathematics concepts and teachers who were not well prepared to teach
459 advanced concepts.

460 However, an interesting point to note was the difference in the performance of mathematics in the two primary
461 schools as compared to the performance of the secondary schools. In primary school 1, mathematics had a mean
462 of 35.33 and it was the best done among the five subjects. In primary school 2, mathematics was the second
463 best done with a mean of 32.5. This was a complete opposite of the findings from the secondary schools where
464 mathematics was the worst done. Findings on better results in mathematics at primary school level supported
465 a number of researchers (Chapman & Stone, 1988; ??orrigan, 1977) The explanation these researchers gave was
466 that mathematics during the primary years was practical and related to everyday activities but as concepts
467 become established the nature of work in numeracy becomes more representational, possibly because learners
468 rely on their memories and have little or no reinforcement from visual promptings, thus learners with visual
469 impairment excel in mental arithmetic. Another explanation that could support better results for mathematics
470 at the lower classes was indicated by Aldrich and Sheppard (2001) who found that many young learners were
471 keen on tactile graphics as they found them quite interesting and derived lots of fun from them, on the other
472 hand, older learners found them more difficult maybe due to the content under study, sometimes calculations
473 can be too long or too complicated to be handled mentally.

474 The second worst done subject in the two secondary schools was biology. This could be attributed to
475 similar factors that affect performance in mathematics. Such are time factor and also the way the examinations
476 were adapted for learners with visual impairment. Sahin and Yorek (2009) observed that learners with visual
477 impairment merely needed proper accommodations to enable them to perform as well as their sighted peers
478 in science. More researchers, (Gardner, Stewart, Francioni & Smith, 2002) agreed that Science, Technology,
479 Engineering and Mathematics (STEM) subjects are known for the huge number of visual resources used which
480 included diagrams, graphs and charts. It is a long-held belief that, technical subjects can be quite challenging
481 to learners with visual impairment. Concepts in STEM subjects could be difficult for grasping by learners with
482 visual impairment because they rely quite heavily on visual representation as in diagrams, graphs and charts
483 (Agarwal, Jeeawoody & Yamane, 2014).

484 Another factor which might have contributed to low performance in biology could be challenges in teaching
485 some of the topics as indicated by the teachers. Jones, Minogue, Oppedal, Cook, Michelle, Broadwell and Bethany
486 (2006) advanced a similar idea that in Science Education, learners with visual impairment reported challenges
487 in learning about topics that they are not able to experience directly. McCarthy (2005) concurs with these
488 researchers that there was evidence that learners with disabilities were often not given the same opportunities
489 to experience science like their non-disabled counterparts, furthermore McCarthy (2005) reported that teachers
490 in special needs education often lacked knowledge about the science curriculum, content involved in science,
491 together with the science pedagogy.

492 Performance in KCSE for the years 2013 -2016 were also explored and the results presented in Figure 3.
493 The average score for the four years was 4.404 with 1 scoring 4.554 whereas school 2's mean score was 4.255, a
494 deviation of 0.299. Therefore, the difference in performance between the two schools was not very significant and
495 the general performance was rather low just as it was found out in the analyzed 2017 results. It is possible that
496 the numerous factors raised by the three categories of respondents indeed impacted negatively on the performance
497 of learners with visual impairment.

498 10 d) Challenges faced by learners with visual impairment 499 during examinations

500 The teachers were asked to identify some challenges emanating from the whole examination process that their
501 learners usually complained about. They came up with nine different issues as indicated in Table 7. Note: 1-least
502 impediment, 9 -biggest impediment Majority of the teachers, 12 (75.0%) reported that their learners complained
503 of questions and diagrams that were poorly adapted. Diagrams that are not well adapted are likely to cause
504 confusion and even mislead the learners leading to wrong responses.

505 Examination adaptation for learners with visual impairment was also highlighted as quite a challenging area
506 in a study by ??raeme et.al. (2009) where data gathered from ten countries indicated that the challenges were
507 experienced in all the countries. Allman (Ghulam et al., 2014), though lower than the Netherlands and Czech
508 Republic, this was still higher than what the Kenyan learners are added. In Kenya learners are added thirty
509 minutes both at primary and secondary school. This translates to 16% extra time in a 3 hours paper and a 25%
510 addition in a two hours paper. This was the lowest extra time added compared to all the countries reviewed.

511 The thirty minutes added is also uniform in all the subjects and yet the teachers reported that some subject
512 would need more time than others. Still in agreement with the need to add learners with visual impairment more
513 time during examinations, the AFB (2016) observed that extended time during examinations was very essential
514 since some learners may be slow in writing and also because some tools that these learners used may pose some
515 challenges. This finding supports Mitchell (2008) who found out that sometimes tools used to assess learners
516 with visual impairment were rigid and not adapted.

517 The same percentage (68.75%) further observed that facilities were inadequate. Braille machines that learners
518 used to write examinations were just enough. In some extreme cases, the learners had to wait for the machines
519 to be repaired as reported by 10 (62.50%) of the teachers. This is in case they broke down during examination
520 period. Such inconveniences are likely to cause untold anxiety to the learners which might in turn affect their
521 performance. It is advisable for schools to have some spare machines to ensure that learners do not get stressed in
522 case they break down during examination time. A further 10 (62.50%) reported that learners pointed out that they
523 usually came across new Braille signs that they had not earlier learnt. A further eight teachers (50.0%) reported
524 that learners complained of strange materials that KNEC usually used in its adaptation of the examination.
525 New materials during examination can easily bring confusion and anxiety to the candidates. A few teachers; 5
526 (31.25%) said that the learners complained of very long passages in languages. Reading and responding to such
527 long passages could cause fatigue to the learners. Three teachers, (18.75%) reported a possibility of learners
528 experiencing some form of anxiety during examinations. Presence of unfriendly supervisors and invigilators
529 during examinations was reported by 2 (12.50%) of the teachers. The two teachers reported that some learners
530 with visual impairment often complained of unfriendly examination supervisors and invigilators who never made
531 any attempt to create some rapport with them during examinations. A new strange voice to a learner who is not
532 able to see the person who is speaking can easily make them uneasy. This can be countered if the supervisors
533 and invigilators took time to build some rapport with the learners before they start the examination.

534 Though among the least rated, there is broad agreement in literature that test anxiety is responsible for lower

12 A) RECOMMENDATIONS

535 academic performance. Hill and Wigfield (1984) reported that test anxiety has affected about 25% American
536 learners at both primary and secondary levels.

537 In support of this was Seipp, (1991) who metaanalyzed 126 American and European studies and found negative
538 correlation between academic performance and anxiety. So, it is no wonder that some teachers (18.75%) in this
539 study brought it up as one of the issues that their learners complained about.

540 11 VII. Conclusions and Recommendations

541 A number of conclusions were drawn from the findings of the study. First, the findings indicated that performance
542 of learners with visual impairment in summative evaluation was below average. Mathematics and Science were
543 the worst done subjects at secondary level whereas Social Studies and Kiswahili were the two worst done at the
544 primary level. The teachers pointed out a number of issues that most likely affected the performance.

545 12 a) Recommendations

546 The following recommendations were proposed in line with the findings.

547 To ensure that learners with VI are not disadvantaged when it comes to sitting examinations, the Kenya
National Examination Council should;¹

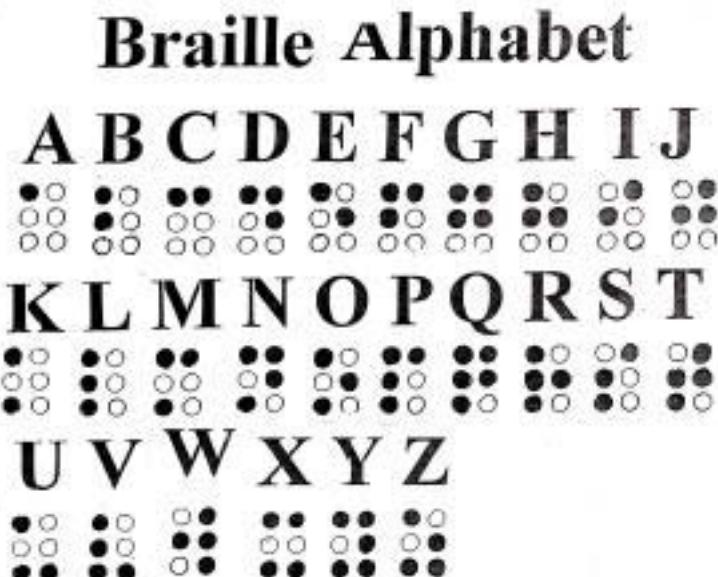


Figure 1:

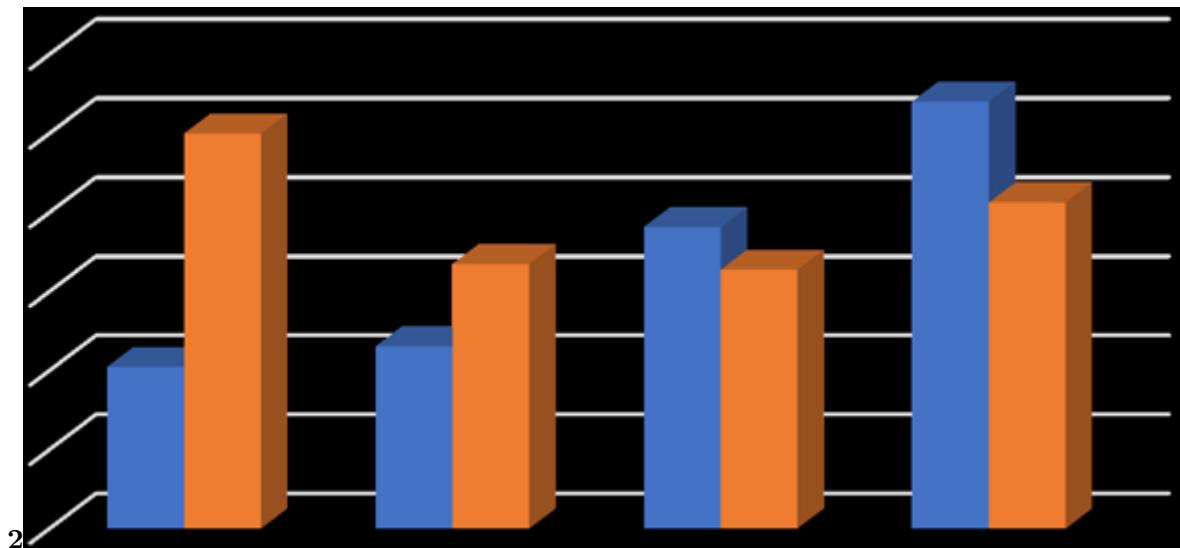


Figure 2: Figure 2 :

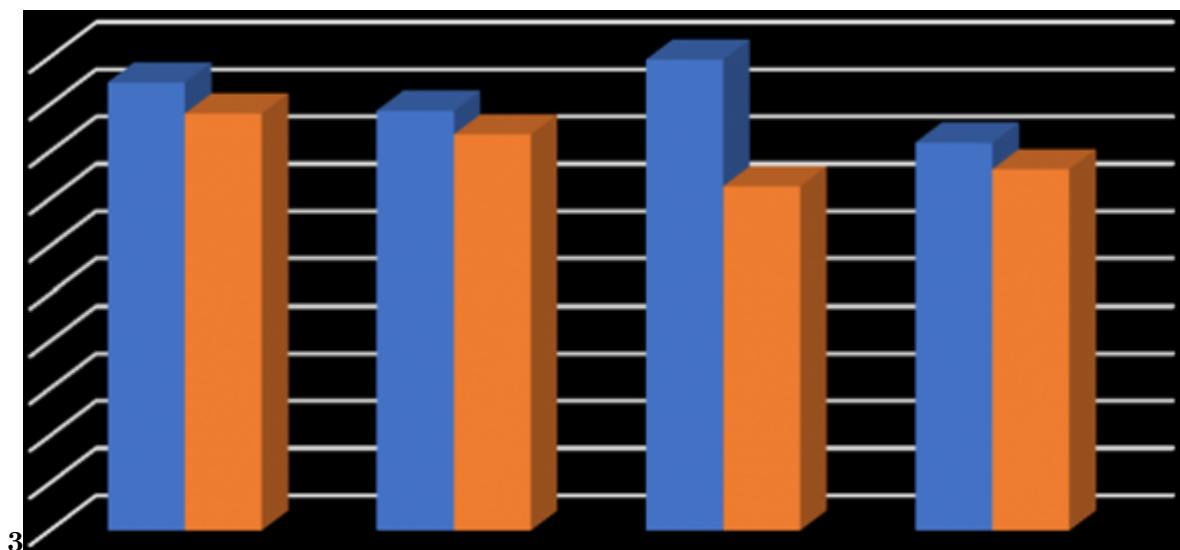


Figure 3: Figure 3 :

12 A) RECOMMENDATIONS

1

Year	No of learners who sat Examination	No passed	No failed	Pass %	Fail %
2016	9	0	9	0	100
2015	11	1	10	9	91
2014	8	2	6	25	75
2013	6	2	4	33	67
2012	5	1	4	17	83
2011	4	1	3	25	75
2010	3	1	2	33	

Source: Special Education Dept, 2017 in Habulezi, Kefilwe & Malatsi

Habulezi et al. concluded that performance of learners with visual impairment in science was influenced by deficient pedagogical practices, insufficient teaching and learning materials and also

shortage of specialized teachers of science. In partial support of these findings, (Beck-Winchatz & Riccobon 2008; Moreland, 2015) noted that majority of teachers face difficulties when teaching learners with visual

Figure 4: Table 1 :

2

	Primary schools (KCPE)	
	School 1	School 2
English	31.00	35.67
Kiswahili	33.50	30.50
Math	35.33	32.50
Science	34.67	29.92
S/Studies	33.00	29.58

Source: KNEC, 2018

Figure 5: Table 2 :

3

SUBJECT	A	A-B+	B	B-C+	C		C-D+	D	D-	E
ENG	0	0	1	0	1	4	2	6	4	16
KIS	0	0	2	1	2	2	6	7	4	11
MATHS	0	0	0	1	0	0	0	0	4	6
BIO	0	0	0	0	1	0	1	0	7	16
HIST	2	2	2	4	4	2	6	5	2	8
C.R. E	0	2	4	6	6	1	3	5	1	13
GEO	0	0	0	3	2	3	1	2	2	4
H/SCI	0	0	0	4	3	6	3	4	0	6

Figure 6: Table 3 :

5

SUBJECT	Total No of learners	SCHOOL		SCHOOL		Av. Points
		1	Ave.	2	Av.	
ENG	172	44	3.91	24	9	2.67
KIS	196	44	4.45	26	9	2.89
MATHS	66	44	1.50	9	9	1.00
BIO	87	44	1.98	14	9	1.56
HIST	253	44	5.75	39	9	4.33
C.R.E	263	44	5.98	35	9	3.89
GEO	106	20	5.3	-	-	106
H/SCI	162	28	5.79	47	9	5.22
AGR	39	11	3.55	4	3	1.33
FRENCH	4	1	4.00	-	-	4
MUSIC	32	7	4.57	3	2	1.50
B/ST	25	7	3.57	8	4	2.00

Figure 7: Table 5 :

6

Subject	Eng	Kis	Math	Bio	Hist.	C.R. E	Geo.	H/Sci	Agri	Fren	Mus	B/St
Ave.	3.29	3.67						1.25	1.77	4.94	5.30	5.51
Points										5.04		3.04

Figure 8: Table 6 :

7

Impediments	Frequency (N = 16)	Percent	Rating (1-9)
Poor adaptation of questions and diagrams	12	75.0	9
Inadequate time	11	68.75	8
Inadequate facilities	11	68.75	8
New Braille signs in examinations	10	62.50	7
Breaking down of machines	10	62.50	7
New materials in examinations	8	50.0	6
Long passage in languages	5	31.25	5
Panic and anxiety	3	18.75	4
Unfriendly supervisors & invigilators	2	12.50	1

Figure 9: Table 7 :

Figure 10:

12 A) RECOMMENDATIONS

549 .1 Year 2021

550 Performance of Learners with Visual Impairment in Summative Evaluation in Special Schools in Kenya as to close
551 the gap between them and their sighted peers, (iv) There should be capacity building for teachers for learners
552 with visual impairment in order to make them more competent.

553 [Lafiagi] , Nigeria Lafiagi . *Journal of Research and Methods in Education* 4 (5) p. 1.

554 [National Policy on Education ()] , *National Policy on Education* 2004. Federal Government Press. (4) . Federal
555 Republic of Nigeria (th ed.)

556 [Olalekan ()] , O Olalekan . 2016.

557 [Egunyomi (ed.) ()] *(Eds) widening access to Education as social justice: Essays in honor of Michael Canolawa*,
558 D Egunyomi . Oduaran, A. And Bhola, H.S (ed.) 2006. The Netherlands; Dordrecht: Springer. p. . (Access
559 to Basic Education for Girls: The Nigerian Experience)

560 [Saima and qadir ()] *A Study of factors affecting Learners performance in examinations*, R Saima , B &qadir .
561 2011. San Francisco.

562 [Maguvhe ()] *A study on inclusive Ed and its effects on the teaching of biology to learners with visual impairments*,
563 *Thesis (Abstract) Department of Curriculum Studies*, M O Maguvhe . 2005. Pretoria. Faculty of Education,
564 University of Pretoria

565 [Ramakrishnan ()] *A study on verbalism among visually impaired children*, R Ramakrishnan . <https://pdfs.semanticscholar.org/1c49/04b4074cd23> 2013.

566 [Umameh ()] *A Survey of Factors Responsible for Students' Poor performance in Mathematics in Senior
568 Secondary School Certificate Examination in Idah Local Government area of Kogi State*, M Umameh .
569 <https://www.academia.edu/7671293> 2011. Nigeria.

570 [Winchatz and Riccobono ()] 'Advancing Participation of Blind Students in Science'. Winchatz , M Riccobono .
571 <https://www.researchgate.net> Technology, Engineering and Math 2008. net>2236 Retrieved on 21 st March
572 2019.

573 [Osunde and Izevbogie ()] *An Assessment of Teachers' Attitude Towards Teaching Profession in Midwestern
574 Nigeria*, W Osunde , T Izevbogie . 2006. 126 p. .

575 [Maina ()] *An Investigation into the causes of poor performance in Kiswahili Examination in Kipipiri Division
576 of Nyandarua District*, E Maina . 2003. Nairobi. Nairobi University (Unpublished M.ed Thesis)

577 [An Investigation of Mathematics Performance of High School Students in Lagos State, Nigeria: External Factors]
578 *An Investigation of Mathematics Performance of High School Students in Lagos State, Nigeria: External
579 Factors*, Nigeria. University of Wyoming

580 [Maliki et al. ()] 'Analysis of Students' Performance in JUNIOR Secondary School Mathematics Examination in
581 Bayelsa State of Nigeria'. A Maliki , A Ngban , J Ibu . *Student Communication Science* 2009. 3 (2) p. .

582 [Seipp ()] 'Anxiety and Academic Performance: A Meta-analysis of Findings'. B Seipp . *Anxiety Research* 1991.
583 4 p. .

584 [Nara et al. ()] 'Attitudinal and motivational factors influencing performance in English language among
585 Tanzanian school students'. M Nara , H Eunjin , W Reubenson . *Journal of Students //files.eric.ed.gov/*
586 47. Nyamubi, S. (ed.) 2015. 2003. Unpublished Masters' Thesis. University of Dar es salaam (Impact of
587 English Proficiency on academic performance of International Students)

588 [Maguvhe ()] 'Being a blind researcher in South Africa: A critical assessment'. M O Maguvhe . *Perspectives in
589 Education* 2003. 21 (3) p. .

590 [Kinyanjui ()] *Challenges of completing Neologisms. A case of Kiswahili teaching Terminology*, J Kinyanjui .
591 2014. Nairobi. University of Nairobi (A Thesis)

592 [Cliffe ()] E Cliffe . *Accessibility of Mathematical Resources: The Technology Gap*. *MSOR Connections*, 2009. 9
593 p. .

594 [Kalra et al. ()] 'Design of a Braille Writing tutor to combat illiteracy'. N Kalra , T Lauwers , D Dewey , T
595 Stepleton , M B Dias . *Information Systems Frontiers* 2009. 11 (2) p. .

596 [Soer ()] *Distribution of Professional Educators in Transvaal*, W Soer . 2009. Durban: Butterworths.

597 [Yohana (2012)] *Effects of language instruction on students' performance in English: Experience from secondary
598 schools in Dodoma*. Retrieved from www.amazon.com, E Yohana . 2012. June 6. 2018.

598 [Malekela (ed.) ()] *English as a medium of instruction in post primary education in Tanzania: Is it a fair policy
600 to the learners?*, G Malekela . Brock-Utne, B., Desai, Z., and Qorra, M. (ed.) 2013. Dar es salaam: E&D
601 Limited. (Language of Instruction in Tanzania and South Africa)

602 [Fakeye and Ogujiji ()] 'English Language Proficiency as a Predictor of Academic Achievement among EFL
603 Students in Nigeria'. D Fakeye , Y Ogujiji . *European Journal of Scientific Research* 2009. 37 p. .

12 A) RECOMMENDATIONS

604 [Ogunsiji and Fakeye ()] 'English Language proficiency as a predictor of academic achievement among EFL
605 students in Nigeria'. Y Ogunsiji , D Fakeye . *European Journal of Scientific Research* 2009. 37 (3) p. .

606 [Ghulam et al. ()] 'Examinations and Accommodations for learners with disabilities'. F Ghulam , F Rukhsana ,
607 M Misbah . *Academic Research International Journal* 2014. 5 (3) p. .

608 [Rowlet and rowlet ()] 'Experiences of Learners with Visual Impairments'. J Rowlet , E &rowlet . *Teaching STEM
609 Subjects to Blind and Partially Sighted Learners: Literature Review and Resources*. RNIB, C Heather (ed.)
610 (Birmingham) 2012. 2013.

611 [Miheso ()] *Factors affecting mathematics performance among secondary school students in Nairobi Province*, M
612 Miheso . <https://ir-library.ku.ac.ke/handle/1234567> 2012. (Kenya. Unpublished Thesis)

613 [Harb and El-Shaarwi ()] *Factors affecting students' performance*, N Harb , Ahmed El-Shaarwi , A . 2006.
614 (MPRA Paper No. 1362)

615 [Mosha ()] *Factors affecting students' performance in Zanzibar Rural and Urban secondary schools*, M Mosha .
616 <https://pdfs.semanticscholar.org/12> 2014.

617 [Habulezi et al. ()] 'Factors influencing the poor academic performance of learners with vision impairment in
618 science subjects in Kgaleng District in Botswana'. J Habulezi , P Kefilwe , M Nelly . *International Journal
619 of Learning, Teaching and Educational Research* 2017. p. .

620 [Bisi ()] *Impact of Technology Intervention on Visually Impaired Students' performance in Kiswahili in Public
621 Primary Teachers' Colleges in Kenya*, F M Bisi . 2013. University of Nairobi. Nairobi (PhD Thesis)

622 [Integrating Print and Braille. A Recipe for Literacy. An Excellent Resource about Dual Media Issues for Teachers and Parents A
623 'Integrating Print and Braille. A Recipe for Literacy. An Excellent Resource about Dual
624 Media Issues for Teachers and Parents'. <http://www.pathstoliteracy.org/resoueces/integrating-print-and-braille-recipe:literacy> American Foundation for the Blind 2016.
625 July 2016.

626 [Andrade ()] 'International students in English-Speaking Universities: Adjustment factors'. M S Andrade .
627 *Journal of Research in International Education* 2005. 5 p. .

628 [Kapperman and Sticken ()] G Kapperman , J Sticken . <http://s22318.tsbvi.edu/mathproject/into.asp#main> *Barriers to Achievement in Mathematics*, 2004.

629 [Kenya Certificate of Secondary Education Results ()] *Kenya Certificate of Secondary Education Results*,
630 <https://kenyayote.com<official> 2018. Kenya National Examination Council

631 [Okombo ()] *Language policy. The forgotten parameter in African Development and Government Strategies*, O
632 Okombo . 2001. Nairobi: Nairobi University Press.

633 [Ferrell et al. ()] *Mathematics Research and Analysis*, K Ferrell , M Buettel , R Pearson . <https://www.unco.edu/ncssd/research/APH%20%maths%20Reprt> 2006. National Center on Low -Incidence Disabilities.
634 University of Northern Colorado

635 [Okafor and Anaduaka ()] 'Nigerian School Children and Mathematics Phobia: How the Mathematics Teacher
636 can help'. C Okafor , U Anaduaka . *American Journal of Educational Research* 2013. 1 (7) p. .

637 [Mwangi ()] *Pedagogical challenges faced by Mathematics Teachers of Learners with visual impairment at Thika
638 Primary School for the Blind*, W Mwangi . 2014. Kenya. Kenyatta University (Unpublished Thesis)

639 [Lynn ()] *Performance of Learners with Visual Impairment on High-Stakes Tests: A Pennsylvania Report Card*,
640 A Lynn . 2012. Dissertation Presented at the University of Pittsburgh school of Education

641 [Ayong ()] 'Poor Performance in Mathematics among Senior Secondary School Students in Kaduna State: What
642 is to blame'. H Ayong . *Journal of Research in National Development* 2013. 11 (2) p. .

643 [Idowu ()] *Pre-service Teachers' Perception on Poor Performance of Elementary School Students in Mathematics*.
644 *Unpublished Manuscript*, College of Education, O Idowu . 2015. University of Wyoming. U.S.A.

645 [Primary Teachers Examinations Kenya National Examinations Council ()] *Primary Teachers Examinations Kenya
646 National Examinations Council*, <http://academics.uonbi.ac.ke/content.kenya-national-examinations-council>. 2012. 2013. 17th October, 2018. Kenya National
647 Examination Council

648 [Msanjila ()] *Problems of writing Kiswahili. A case study of Kigurunyembe and Morogoro Secondary Schools in
649 Tanzania*, Y Msanjila . 2005. Dar es salaam: Nordic.

650 [Ruth et al. ()] C Ruth , D Linda , A Alethea , R Nikole , O Stelios . <https://edpolicy.stanford.edu>Professional Learning in the Learning Profession: A Status Report on Teacher Development in the U.S and Abroad>, 2009. 2005. National Staff Development Council

651 [Kumar et al. ()] 'Science for Learners with Visual Impairment. Teaching Suggestions and Policy Implications
652 for Secondary Educators'. D Kumar , R Ramasamy , G Stefanich . *Electronic Journal of Science Education*
653 2001. 5 p. .

660 [Schmidt and Cagran ()] 'Self-concept of learners in inclusive settings'. M Schmidt , B Cagran . *International
661 Journal of Special Education* 2008. 23 (1) p. .

662 [Chapman and Stone ()] 'Special Needs in Ordinary Schools: The Visually Impaired Child in Your Class'. K
663 Chapman , J Stone . *Cassell: Great Britain* 1988.

664 [Olanipekun et al. ()] *Students' English Language proficiency and academic performance in vocational education
665 in college of education*, S Olanipekun , I Garuba , Y Mohammed , A Ohiemi . 2014.

666 [Aldrich and Sheppard ()] 'Tactile Graphics in School Education: Perspectives from Pupils'. F Aldrich , L
667 Sheppard . *British Journal of Visual Impairment* 2001. 19 (2) p. .

668 [Carmen ()] *Teacher's guide to assessment, Archidiocese of Canberra and Goulburn, Canberra*, W Carmen .
669 <https://www.det.act.gov.au/teaching...learning/teachersguidetoassessment> 2019. 2011.
670 (Teaching students with visual impairments; Language Development)

671 [Fraser and Maguvhe ()] 'Teaching life sciences to blind and visually impaired learners'. W Fraser , M O Magu-
672 vhe . <http://repository.up.ac.za/bitstream/handle/2263/6236/FraserTeaching> *Journal of
673 Biological Education* 2008. 2008. 42 (2) p. . (pdf? sequence)

674 [Agarwal ()] *Teaching Maths to Blind learners through programmed learning Strategies*, S Agarwal . 2004. Abhijeet
675 Publishers: Delhi.

676 [Schleppenbach ()] 'Teaching Science to the Visually Impaired: The VISIONS Lab'. D Schleppenbach . <http://www.nfb.org.bm/bm97/bm970.htm> *The Braille Monitor* 1997. 40 (1) .

677 [Sahin and yorek ()] *Teaching Science to Visually Impaired Learners: A Small-Scale Qualitative Study; US-China
679 Education Review*, M Sahin , N &yorek . 2009. 6 p. .

680 [Mwakyeja (2013)] *Teaching Students with Visual Impairments in Inclusive Classrooms. A Case Study of
681 One Secondary School in Tanzania*, B M Mwakyeja . <https://www.duo.uio.no/bitstream/handle/10852/36642/MasterxsxThesis.pdf?sequence=1> 2013. May 05, 2017. University of Oslo.

682 [Allman (2009)] 'Test Access: Making tests accessible for learners with Visual Impairment: A guide for test
684 publishers, test developers and state personnel'. C Allman . <http://www.aph.org/tests/access2pdf>
685 *Lousville, KT: American Printing House for the*, 2009. September, 2019. (th edition)

686 [Hill and Wigfield ()] 'Test anxiety. A major educational problem and what can be done about it'. K Hill , A
687 Wigfield . 10.1086/461399. <https://doi.org/10.1086/461399> *The Elementary School Journal* 1984. 85
688 (1) p. .

689 [Abbott (2014)] 'The Glossary of Education Reform by Great Schools <http://edglossary.org/> hidden-curriculum'.
690 S Abbott . Retrieved on 30th, 2014. September 2017.

691 [Kapoli ()] *The impact of English language as a medium of instruction on the training and performance of
692 secretaries*, J Kapoli . 2001. Dar es salaam. University of Dar es salaam (Unpublished Masters' Thesis)

693 [Harmer ()] *The practice of English language teaching*, J Harmer . 2003. Malaysia: Longman.

694 [Gardner et al. ()] 'Tiger, AGC and Wintriangle, removing the Barrier to STEM Education'. J Gardner , R
695 Stewart , J Francioni , A Smith . <http://www.CSun.edu/cod/conf/2002/proceedings/CSun02.htm>
696 *Proceeding of 2002 CSUN Conference*, (eeding of 2002 CSUN Conference) 2002.

697 [Clamp ()] 'Visual Impairments: Access to Education for Learners and Young Persons'. Clamp . *Mathematics in
698 Mason, H. & Call, M.* (London) 2003. 2003. David Fulton Publishers.

699 [Jones et al. ()] 'Visualizing without vision at the Microscale: Students with visual impairments explore cells
700 with touch'. K Jones , J Minogue , T Oppewal , M Cook , B Broadwell . *Journal of Science Education and
701 Technology* 2006. 15 (5) p. .

702 [Mitchell (ed.) ()] *What really works in special and inclusive education? Using Evidence based teaching strategies*,
703 D Mitchell . Routledge. Taylor and Francis Group (ed.) 2008. London.