

## Physical Facilities as Predictors of Academic Achievement of Learners with Physical Impairments in Kenya.

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### ABSTRACT

Through legal and policy guidelines, the Kenya government and other stakeholders have made efforts to promote academic achievement of all learners regardless of their diversity of disabilities. However, learners with physical impairments (PI) in public primary special schools in Kisumu County still perform poorly in national examinations. The purpose of this study was therefore to investigate the physical facilities as predictors of academic achievement of learners with physical impairments in public primary special schools for learners with PI in Kisumu County, Kenya. The study objective was to determine the relationship between physical facilities and academic achievement of learners with PI. The study used Maslow's theory of Motivation. The study used concurrent triangulation design within mixed methods approaches. The target population was; 2 head teachers of public primary special schools for learners with PI, 45 teachers, and 503 learners with PI, a total population of 550 participants. Saturation sampling technique was used for head teachers, while purposive sampling technique was used for teachers and learners with PI. Sample size was 2 head teachers, 16 teachers and 150 learners with PI, a total of 168 respondents. Data was collected using questionnaire, interview schedules, and observation checklist. Content validity was used for validity, while Cronbach's alpha which recorded a correlation coefficient of .675 was used to ascertain reliability. Quantitative data was analyzed using descriptive and inferential statistics such as Pearson's product moment correlation coefficient and multiple regression analyses, and presented using frequency tables, graphs and pie charts from which conclusions were made. Qualitative data was analyzed using thematic analysis. The study results indicated that: there was a statistically significant positive relationship ( $r = .363$ ) between physical facilities and academic achievement of learners with PI. It can therefore be concluded from the current study that physical facilities are significant predictors of academic achievements of learners with PI in public primary special schools for learners with PI. The study therefore recommended that the Ministry of Education (MoE) should facilitate adequate physical facilities. The study would benefit; parents, children with PI, schools, teachers, MoE, curriculum developers, education planners, policy makers and Kenyan government in improving service provision of physical facilities and academic achievements of learners with PI, and would serve as a basis for further research for scholars in the area of education in general.

**Keywords:** *Physical Facilities, Physical Impairments, Academic Achievements*

## 1.0 Introduction

Article 28 of the United Nations Convention on the Rights of the Child (UNCRC) (1989), states that all children and young people have a right to education no matter who they are, or disability. Article 11 of the African Charter on the Rights of Children states that every child shall have the right to education (Skujyte, 2011). Article 18 (2) of the Persons with Disabilities Act 2003 (6) states that learning institutions shall take into account the special needs of persons with disabilities with respect to use of school facilities, and other similar considerations (Wango, 2011). For many children with disabilities (CWDs), the kinds of disabilities they experience may require special approaches to education or other accommodations (Brault, 2011). It is therefore vital to ensure that due to physical challenges that learners with PI go through, they should get physical facilities that make them operate near normal so as to learn comfortably in schools.

Physical facilities in schools for learners with PI include infrastructure; assistive devices; specialized equipment (assistive technology); and instructional materials (Bulat, Hayes, Macon, Ticha & Abery, 2017). These brings in to the mind whether schools for learners with PI have adequate physical facilities and whether these physical facilities assist them to learn. Children need to meet various physical demands during the school day in order to be successful from both an educational and a social standpoint, and they use important motor skills to move in the halls, sit quietly at a desk, and participate with peers on the playground. However, due to physical impairments, there are several environmental and psychological factors that may affect the academic achievement of learners with PI such as pain, fatigue, and absenteeism; and psychological factors such as motivation, self-concept and socio-emotional problems among others. These need to be identified so as to make necessary modifications to minimize their effects.

In Bangladesh in South Asia, Zubayer (2011) contends that majority of the schools for learners with PI are physically inaccessible to many learners. If school physical facilities for learners with PI are not well adapted, they may not operate with ease within the learning or school environment and this may negatively influence their academic achievement. In Accra in Ghana most learners with mobility impairments have physical barriers (Addo, 2014). If the learning environment is not adapted to suit their needs, then their learning process such as working in groups or undertaking different tasks may be affected hence may negatively influence their academic achievement. In Kiambu majority of learners with PI lack relevant physical facilities (Karandu, 2014). Based on the challenges faced by learners with physical impairments, their education programmes are expected to be designed in order to help them overcome the effect of their physical impairments and associated difficulties so as to promote their academic achievement. There is therefore need for appropriate physical environment so as to improve their academic achievement hence reach their potential.

School physical facilities affect learners with PTs' health, behavior, engagement, learning and growth in achievement, and they also impact teaching and learning (Ndirangu, 2016). With all these in mind, one may wonder whether learners with PI in public primary special schools have adequate and accessible physical facilities. Table 1.1 shows Kenya Certificate of Primary Education (KCPE) performance of learners with PI in Kisumu County for the past five years.

**Table 1.1: KCPE Performance of Public Primary Special Schools for Learners with PI.**

SCHOOL	COUNTY	YEAR (MSS)					MSS
		2014	2015	2016	2017	2018	
L	Homa-Bay	215.45	200.65	212.65	230.75	194.05	<b>1053.55</b>
M	Kisii	186.02	201.87	197.43	221.93	182.44	<b>989.69</b>
N	Nyamira	183.56	199.39	192.08	218.76	192.06	<b>985.85</b>
O	Kakamega	204.34	216.01	222.32	240.57	199.02	<b>1082.26</b>
P	Kakamega	230.12	234.08	241.67	240.69	241.98	<b>1188.54</b>
Q	Bungoma	214.09	209.00	226.65	243.01	192.45	<b>1052.20</b>
R	Bungoma	213.68	201.41	221.79	242.17	194.11	<b>1073.16</b>
Y	Kisumu	171.35	202.23	185.62	240.68	165.43	<b>965.31</b>
X	Kisumu	182.04	198.03	179.98	220.92	190.26	<b>971.23</b>

Source: Kisumu, Homa-Bay, Kakamega, Nyamira, Kisii, & Bungoma County Offices (2014-2018).

### 1.2 Statement of the Problem

Learners with PI are expected to; operate with ease in the school learning environment, undertake different tasks, work in groups, be actively involved in learning and perform well by passing all their subjects for good academic achievement. They are expected to meet various physical demands during the school day in order to be successful from both an educational and a social standpoint. Schools are therefore expected to have a least restrictive friendly learning environment in order to produce learners with good academic achievements. Therefore, investigating what predicts their academic achievement is vital.

Physical facilities are according to literature and legal policy guidelines important to learners with physical impairments as far as their academic achievement is concerned. Efforts have been made by the government and stakeholders to provide them to all public primary special schools. However, learners with physical impairments in public primary special schools in Kisumu County continue to perform poorly in national examinations (Table 1.1). This happens despite having qualified teachers and even being given extra time during examinations to compensate for their disabilities. The study sought to find out why.

### 1.3 Purpose of the Study

The purpose of the study was to investigate physical facilities as predictors of academic achievement of learners with PI in public primary special schools in Kisumu County, and was guided by the following objective; To determine the relationship between physical facilities and academic achievement of learners with PI in public primary special schools in Kisumu County.

### 1.4 Theoretical Framework

The study used Maslow's theory of motivation which is a hierarchy of needs comprising a 5-tier model of human needs, normally depicted as hierarchical levels. The needs lower down in the hierarchy must be satisfied before an individual can attend to needs higher up. The needs from the bottom are: Physiological needs; Safety needs; Belonging and Love needs; Esteem needs and Self Actualization. Physiological needs are biological requirements for human survival such as food, shelter, clothing, air, drink, sleep and warmth. Other needs are becoming secondary until these needs are met. The need for Safety and Security becomes salient once individual's Physiological needs are satisfied.

After Physiological and Safety needs are satisfied, the third level is Love and Belonging needs. These are social needs which involve feeling of belongingness such as friendship, intimacy, trust and acceptance, receiving and giving affection and love, affiliation, and being part of a group such as friends. After individual's Physiological needs, Safety needs, and Love and Belonging needs are satisfied, the individual's Esteem needs become next. Esteem needs are classified into two categories; that is, esteem for oneself (dignity, achievement, mastery, independence); and the desire for reputation or respect from others such as status or prestige. After all the four needs are met, the individual can move to Self-Actualization. The individual realizes personal potential, self fulfilment, seeking personal growth and peak experiences. A desire to become everything one is capable of becoming (Maslow, 1970).

The use of Maslow's theory of motivation in this study had the justification that it shed light on educational structure by reminding administrators and teachers of learners with PI that learners are less likely to perform at their full potential if their basic needs are unmet, and that they must consider learners needs in their hierarchical order.

This theory informed the present study in primary special schools of learners with PI where these schools need to ensure that the needs of learners with PI are met to help them have good academic achievement. Hence, for learners with PI to get physiological needs, the school physical facilities should be available, adequate, accessible and well adapted to suit learners with PI's needs. They need well ventilated buildings to get fresh air, they need to be able to access water points, dining halls, and canteens among others. In order to support safety needs of learners with PI, physical facilities in the learning environment should be adapted to meet their needs and avoid injuries.

To support love and belonging needs, the classrooms should be adapted such that the seating arrangements in classrooms enable learners using wheel chairs to move freely as this helps them to support each other. To support esteem needs, it is vital to adapt the learning environment to make them operate with confidence. When learners with PI are supported in all these stages noted earlier, they can therefore perform at their fullest potential, that is, Self-Actualization. Learners who are good at different subjects can be used to help their classmates with their work, hence their academic achievement.

## **2.0 Literature Review**

A study was conducted in New York by Coulon (2015) on exploring the impact of assistive technology in the classroom for learners with disabilities. The study results revealed that when learners use AT such as Ipad, software, speech generators, electronic notebooks, and computer assisted instruction, there was an increase in academic achievement such as spelling or writing among others. The previous study only used analytical review to explore the impact of AT hence lacked varied opinions from the respondents. The current study used mixed method approaches to fill in the gaps left out in the previous study as far as instrumentation is concerned. Also, the previous study was conducted in a developed country while the current study was conducted in a developing country Kenya which would enable comparison of cross-cultural similarities and differences if any.

In Phillipines, Figueroa, Lim and Lee (2016) carried out a study on investigating the relationship between school facilities and academic achievements through geographically weighted regression. The study results revealed that schools with basic facilities have performed better than schools with poor facilities therefore basic facilities are important. The previous study was general on learners in schools while the current study was carried out on special category of learners, that is, learners with PI since learners with PI may have more diversified needs. Also, the previous study was conducted

in a developed country while the current study was conducted in a developing country Kenya which would enable comparison of cross-cultural similarities and differences if any.

Oluremi and Olubukola (2012) did a study on impact of facilities on academic performance of students with special needs in mainstreamed public schools in southwestern Nigeria. The study results revealed that there were no handrails, instructional materials, adapted toilets; and the available few were in poor condition such as of type writers, resource rooms, and wheelchairs. The study found out that there was a significant relationship between availability of facilities and academic performance of students with special needs; and, inadequate provision of facilities and materials to mainstream public schools would lead to poor academic performance of students with special needs. The previous study was carried out in Nigeria while the current study was carried out in Kenya since each country may have its own unique needs. Also, the previous study was carried out in a school with different types of disabilities while the current study was carried out on learners with a specific type of disability since their physical needs may vary.

In Bauchi state in Nigeria, a study was conducted on impact of school facilities on students' academic achievement by Ibra, Umar and Igbaji (2017). The results revealed that there was no statistically significant relationship in the area of school facilities and students' academic achievement as measured by the TLEA at 0.05 levels. The samples used for the previous study was smaller and only involved 84 principals. This limited generalizability of the findings and had possible statistical errors. The current study therefore involved the headteachers, teachers, and learners with PI who are the consumers of the services with a bigger sample of 168 to fill the gaps left out by the previous study.

In Tanzania, Tety (2016) did a study on role of instructional materials in academic performance in community secondary schools using a cross-sectional design in Rombo District. The study results revealed that instructional materials are key to teacher's performance and learners' academic performance. The previous study used a smaller sample size, which may affect the reliability of a survey's results because it leads to a higher variability which may lead to bias which may be caused by non-response since some subjects may not have the opportunity to participate in the study. The current study used a bigger sample to fill the gaps left out by the previous a study.

A study was conducted by Maingi (2016) on factors influencing academic performance of students with special needs in institutions of higher learning in middle colleges in Machakos County Kenya. The study results revealed that physical facilities such as adapted classrooms, extra notes and handouts among others influence academic performance. The previous study only used quantitative data hence lacked qualitative data that would record attitudes, feelings and behaviors, and could create openness and encourage people to expand on their responses as well as opening up new topic areas not initially considered. The current study therefore also used qualitative research that would fill the gaps left by the previous study.

In Kobauni Division Machakos County Kenya, Muendo (2016) conducted a study on influence of school infrastructural environment on academic performance in Kenya Certificate of Secondary Education. The study results found out that schools do not have adequate physical facilities such as classrooms, laboratories, libraries and dormitories among others which negatively affect their academic performance. The previous study was conducted in secondary schools while the current study was conducted in primary schools. The previous study did not use qualitative data hence lacked qualitative dimension that would allow respondents to express their views or feelings, while the current study used interview schedules and observation checklist to gather more rich, in-depth and detailed information for data analysis.

Most of these studies used either quantitative or qualitative approaches only, hence either lacked quantitative dimension which is useful for generalization or lacked qualitative dimension hence



could not provide participants a chance to express feelings and expressions. Some studies also left out the relationship between physical facilities and academic achievement of learners with PI in public primary special schools, which the current study captured.

### **3.0 Methodology**

#### **3.1 Research Approach**

The study used mixed method approaches which involve conducting research involving collecting, analyzing, merging qualitative and quantitative research, as well as integrating quantitative and qualitative data (Creswell, 2012). It complements the choice of a single design by overcoming the weaknesses of a single design and also addresses a question at different levels.

#### **3.2 Research Design**

The study used triangulation design which is characterized by two or more methods used to confirm, cross-validate, or corroborate findings within a study. That is, collection of quantitative and qualitative data simultaneously and analysis done at the same time (Creswell, 2014). Triangulation design makes intuitive sense (Creswell, Plano, & Garrett 2008). The design was more appropriate since both methods are used to overcome a weakness in using one method with the strengths of another (Cohen & Manion, 2011).

#### **3.3 Location of the Study**

The study was carried out in Kisumu County located in the Nyanza area of Western Kenya which is divided into seven Sub-Counties, that is; Kisumu West Sub-County, Kisumu East Sub-County, Kisumu Central Sub-County, Muhoroni Sub-County, Seme Sub-County, Nyando Sub-County, and Nyakach Sub-County (Kenya Population Housing Census, 2019). The study was carried out in Kisumu County in public primary special schools for learners with PI in Kisumu County. This is because, as their “normal” counterparts, learners with PI follow the regular curriculum, participate in national examinations and are given more time during national examinations to compensate for their disabilities but have been performing poorly in national examinations as compared to other learners with PI.

#### **3.4 Target Population**

The target population was made up of 550 respondents, who comprised of both 2 head teachers in the 2 schools, 45 teachers, and 503 learners with PI (Kisumu County Education Office, 2019).

#### **3.5 Sampling Techniques and Sample Size**

The study used saturation sampling technique for head teachers which is data satisfaction (Walker, 2012). It was also convenient due to the limited number of head teachers, therefore 2 head teachers were selected. It also used purposive sampling technique for teachers and learners with PI. This is whereby the researcher uses personal judgments to determine cases that have required information (Etikan, 2016). Personal judgments were used to choose cases that help answer research questions (Guest, Namey & McKenna, 2017). Hence 16 teachers and 150 learners with PI in classes 6, 7, and 8 were purposively selected.

#### **3.6 Data Collection Instruments**

The study used questionnaire for learners with PI; interview guide for: teachers and head teachers; and observation checklist for the researcher as data collection tools. These were based on the study objective, the nature of data to be collected and time factor.

### **3.6.1 Validity of Research Instruments**

Validity is the degree to which results obtained from the analysis of the data purports to measure what it does to measure (Li, 2016). Content validity focuses on whether the full content of conceptual description is represented in the measure (Chiang, 2015). The instruments were validated using content validity since it ensures that all possible items that should be used in measuring the concept under study are contained hence were more valid. For attitude of head teachers, teachers and learners with PI, face validity was used, since for attitude test, the role of content validity is not effective (Majumdar, 2005). The readability test was then done. It was then assessed by supervisors from Jaramogi Oginga Odinga University of Science and Technology as suggested by Bolarinwa (2015) that content validity is assessed by use of experts and professionals, and that validity is established by use of a panel of experts in the research subject and field test. The recommendations by the supervisors were used in the development of the final questionnaire, interview guide, and observation checklist. The questionnaire was then ready for piloting test.

Internal validity of the constructs was tested by subjecting the survey data to suitability tests using the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO Index) and the Bartlett's Test of Sphericity, as explained by Gravetter and Wallnau (2000). Therefore, the internal validity of the questionnaire's data set for analysis was assessed. Kaiser (1974) as reported by Field (2005) holds that the Kaiser-Meyer-Olkin measure of sampling adequacy values between 0.5 and 0.7 as acceptable, between 0.7 and 0.8 as good, values between 0.8 and 0.9 as great values and values above 0.9 as superb. For this data, the values were 0.557, implying that the data had acceptable internal validity. Similarly, Field (2005) recommends that Bartlett's Sphericity test statistics should be less than 0.05 for an adequate internal validity. From the results, Bartlett's test for Sphericity are highly significant ( $P= 0.000$ ) for all the items of the questionnaire, further confirming that the questionnaire was of adequate internal validity.

### **3.6.2 Reliability of Research Instruments**

Reliability is a measure of the degree to which research instruments give consistent results after repeated trials (Orodho, 2005). According to Orodho (2009), pre-test is vital. Hence, to increase reliability, piloting was conducted, which, according to Hassan, Schattner, and Mazza (2006), helps to identify any inadequacy in the items in the instruments, misunderstandings, or ambiguities. Reliability is established using a pilot test by collecting data from subjects not included in the sample (Norland, 1990). The researcher conducted a pilot study in 1 public primary special school for learners with PI that is "O" school for learners with PI in Kakamega County which was not used in the study. This was conducted on 15 (10%) learners with PI who were randomly selected. The 10% was used as suggested by Travethan (2020) that researchers need ten times (10%) the number of participants.

Cronbach's alpha was used to ascertain reliability with the Cronbach's alpha values as 0.675. The Cronbach's alpha suggest that the instruments had adequate reliability for the study. These findings concur with the recommendation by Oso and Onen (2013) that a coefficient of 0.60 and above is of adequate reliability.

### **3.7 Data Analysis Methods**

The researcher used both quantitative and qualitative techniques to analyze data. Quantitative analysis was facilitated by coding for the closed-ended questions from the questionnaire. The data was converted into numerical codes which represent attributes or measurements of the variables. Only one code was assigned to each response category. This was done by making a code book that

enabled the data to be entered into the computer. For instance, the data was organized into percentages according to the categories on the Likert rating scale type responses. The researcher identified the independent, dependent and intervening variables and defined them. The researcher then formatted and analyzed data by use of ratio scale (strongly agree to strongly disagree). The data was then tabulated depending on how many strongly agree (5 points), agree (4 points), neutral (3 points), disagree (2 points), and strongly disagree (1 point) and were presented as percentages of the total number of responses. These were then condensed into broader groups of agree for strongly agree and agree; and disagree for strongly disagree and disagree.

The scores were summated to measure the respondents' attitude and the total scores represented the respondents' take over the issue. This was done by the aid of the Statistical Package for Social Sciences (SPSS) version 22 to produce tables and charts. The findings of the study were presented using frequency tables which enabled the presentation of figures such as patterns within figures which would not be made in narrative form (Blessler, 2007). The qualitative data was derived from interview schedules and observation checklist and analyzed using thematic analysis (Braun & Clarke, 2006).

#### 4.0 Findings and Discussions

##### 4.1 Views of Learners with PI on Physical Facilities

The study objective was to determine the relationship between physical facilities and academic achievements of learners with PI in Kisumu County. This objective was addressed through descriptive statistics which explored the views of the respondents on physical facilities, and followed by use of inferential statistics to test the hypothesis on the relationship between physical facilities and academic achievement of learners with PI. In exploring the views of respondents (learners with PI), a nine Likert scaled itemed questionnaire was used. The items whose constructs were related to physical facilities for learners with PI were scored using a five-point continuum scale depending on how many strongly agree (5 points), agree (4 points), neutral (3 points), disagree (2 points) and strongly disagree (1 point) and presented as percentages frequencies of responses. The scores were summated to measure the respondents' attitude on physical facilities in their schools. Their views were summarized in percentage frequencies as shown in Table 4.1. For qualitative data, phases of thematic analysis were used.

**Table 4.1: Views of Learners with PI on Physical Facilities**

Statement of Opinion	SD	D	N	A	SA	Mean	SD
I can move freely from lesson to lesson to learn since there are no obstacles in the learning environment.	40 (27.4%)	50 (34.2%)	7 (4.8%)	27 (18.5%)	22 (15.1%)	2.58	1.43
I access the learning environment with ease to learn.	36 (24.7%)	49 (33.6%)	5 (3.4%)	34 (23.3%)	22 (15.1%)	2.70	1.44
I use computers and audio-visual aids in learning.	51 (34.9%)	52 (35.6%)	1 (0.7%)	24 (16.4%)	18 (12.3%)	2.35	1.41
I use tape recorder when I have writing difficulties.	48 (32.9%)	50 (34.2%)	1 (0.7%)	27 (18.5%)	20 (13.7%)	2.45	1.43
I use adequate assistive devices to learn.	42 (28.8%)	53 (36.3%)	8 (5.5%)	26 (17.8%)	17 (11.6%)	2.49	1.37
When I' m learning, I don' t easily get distracted.	39 (26.7%)	37 (25.3%)	10 (6.8%)	34 (23.3%)	26 (17.8%)	2.75	1.48



I sit comfortably in class when learning.	44 (30.1%)	43 (29.5%)	10 (6.8%)	32 (21.9%)	17 (11.6%)	2.57	1.40
School infrastructure is adequate for me to learn.	47 (32.2%)	27 (18.5%)	7 (4.8%)	40 (27.4%)	25 (17.1%)	2.77	1.54
Instructional materials are adequate for me to learn.	44 (30.1%)	44 (30.1%)	8 (5.5%)	25 (17.1%)	25 (17.1%)	2.59	1.48
Mean average response rate on physical facilities for learners with PI						2.58	0.33

**Key: SA-Strongly Agree, A-Agree, N-Neutral, D-Disagree, SD-Strongly Disagree.**  
**Source: Survey data (2019)**

The findings of the study revealed that physical facilities for learners with physical impairments in public primary special schools for learners with PI in Kisumu County is generally not; adequate and accessible. This was interpreted by an overall mean rating of 2.58 (SD=0.33) in the scale of 1 to 5, implying that most of the available physical facilities in special schools are scanty and are not easily accessible by learners with PI. Despite the fact that physical facilities for learners with PI are vital as they enable them to learn and to move freely from one place to another with ease in school, the results of the survey show that they are barely adequate. For example, when the respondents were asked whether they were able to move freely during the lessons, it emerged that only a small proportion [agree: 27 (18.5%); strongly agree:22 (15.1%)] of them accepted that they are able to freely move, with a majority [strongly disagree: 40 (27.4%); disagree: 50 (34.2%)] of them confirming that they are not able to move freely from lesson to lesson due to some obstacles in the learning environment. This was further reflected by a low average mean response rating of 2.58, though with a fairly high standard deviation of 1.43 indicating a big variation in views among the respondents on the learning environment. In overall, these findings indicate that the learning environment for learners with PI is unfriendly due to physical barriers which prevent learners to move with ease. In addition, when the study sought to establish the general accessibility of learning facilities within the learners' environment, the results of the survey revealed that most learners with PI have poor access to appropriate physical facilities. Suffice; majority of learners with PI indicated that they are not able to access the learning environment with ease. For instance, it came out that only 34 (23.3%) and 22 (15.1%) of the respondents agreed and strongly agreed, respectively, that they easily access the learning environment but majority of the respondents, with 36 (24.7%) disagree and 49 (33.6%) strongly disagree that they access their learning environment with ease to learn, reflecting a low mean rating of 2.70 (SD=1.44).

Qualitative findings also support the above statement which shows that learners with PI are not able to move from place to place with ease or access the learning environment due to inadequacy of physical facilities. When teachers were asked to say whether learners with PI can move freely from place to place within the learning environment, they responded as follows:

*The ramps to most entries are too rough especially to learners using wheelchairs. This makes it difficult for them to move with ease (Class Teacher 3).*

*Learners with PI find it difficult to move from one place to another Especially learners using wheelchairs since the pavements are too rough (Class Teacher 6).*

The response indicates that the learning environment for learners with PI is unfriendly due to physical barriers which prevent learners from moving with ease, accessing and maneuvering the learning environment. From the observation checklist, it was also revealed that access to

classrooms, toilets, libraries, water points, and fire assembly points had physical barriers due to rough ramps which makes it difficult for learners with PI especially the ones using wheelchairs to maneuver. This supports the findings of the study by Zubayer (2011) which pointed out that majority of special schools have physical barriers which make them to be physically inaccessible to many learners with PI. This finding confirms that learners with PI in public primary special schools have difficulties in moving from place to place within the learning environment due to lack of enough adaptations. This makes it difficult for them to access most places in the learning environment. This has implications on how learners with PI obtain physiological needs and safety needs within the school compound. Rough ramps can make them strain more and they may even take more time to move to different places to access what they need. This calls for proper adaptations of the learning environment to make these learners to be able to operate with ease.

On the use of the physical facilities, it came out clearly that only 24 (16.4%) of the learners agreed and another 18 (12.3%) strongly agreed that they sometimes use computers and audio-visual aids in learning, but 51 (34.9%) disagreed and 52 (35.6%) strongly disagreed with the assertion that they use computers and audio-visual aids in learning. This implies that most of the learners do not use computers and audio-visual aids in learning, reflecting a mean rating of 2.35 with a standard deviation of 1.41.

The following interview excerpt show a headteacher and a teacher's responses when they were asked to say whether learners with PI use audio-visual aids and computers in learning:

*Most of the available audio-visual aids are not functional since they are not in good condition. Only a few are functional but not enough for all learners especially if they need to use them at the same time (Class Teacher 16).*

*The available computers and audiovisual aids are not adequate given the high population of learners with PI in the school (Head teacher 2).*

The above interview excerpt shows that even though some computers and audio visual aids are available, not all learners with PI use them due to their inadequacy. Also, from the observation checklist, it was confirmed that there were no adequate computers and audio visual aids for learners with PI. This conforms to a study by Njoroge (2015) which revealed that facilities and resources for learners with special needs were available but not adequate; and a study by Kipkorir and Simatwa (2016) which revealed that there is positive correlation between CBL methods and motivation of students with physical impairments on learning math. The study has shown that there are few audio-visual aids and computers but due to their limited number, and the fact that some are not functional, most learners with PI do not use them. Computers and audio-visual aids are essential especially to learners with motor difficulties as far as aiding their learning is concerned. This calls for, replacement, repair and maintenance and even buying more audio-visual aids and computers depending on the needs of learners with PI in the school.

Equally, only 27 (18.5%) agreed and 20 (13.7%) strongly agreed that they use tape recorder when they have writing difficulties, but more than two out of every three [strongly disagree: 48 (32.9%); disagree: 50 (34.2%)] of the learners who took part in the survey said they had never used tape recorder even when they have writing difficulties, reflecting a mean rating of 2.45 (SD=1.43) in the physical facilities usage scale. The response indicates that the learners with PI who are not able to read or write without assistive devices are disadvantaged due to inadequacy of these devices.

The headteachers and teachers were asked to say whether learners with writing difficulties use tape recorders, the following interview excerpt shows their responses:

*We have some tape recorders but they are few. If for example four teachers want to use them in class at the same time, then it becomes difficult* (Head Teacher 1).

*We do not have tape recorders, learners with writing difficulties therefore, find it difficult to write or to move at the same pace with other learners* (Class teacher 9).

The above excerpt shows that there are learners with writing difficulties who usually miss out due to lack of tape-recorders. This was also confirmed by observation checklist which revealed that there were no tape recorders which could be used by learners with writing difficulties. This conforms to a study by Njoroge (2015) which revealed that facilities and resources for learners with special needs were available but not adequate; and a study by Tety (2016) which showed that instructional materials are key to learners' performance. The tape recorders are vital for learners with PI with writing difficulties to help compensate for their writing difficulties. The findings confirm that there is lack of tape recorders. This may be linked with their ability to write. There is therefore need for schools of learners with PI to have tape recorders depending on the number of learners who need to use them.

Likewise, the results of the survey show that there is inadequate (mean=2.49; SD=1.37) assistive devices to learn; this was reflected by 53 (36.3%) and 42 (28.8%) of the learners who took part in the survey who rejected and strongly rejected, respectively, the assertion that learners with PI in the special schools use adequate assistive devices to learn. Only 26 (17.8%) and 17 (11.6%) of the surveyed learners agreed and strongly agreed, respectively, that they use adequate assistive devices in their school to learn.

The following interview excerpts show responses from a teacher and a head teacher when they were asked to say whether learners with PI use adequate assistive devices:

*Mobility aids for our learners with mobility difficulties are available, however, most equipment that aid learning are limited in number* (Head Teacher 2). *There is no equipment such as page turners and adapted key boards to help learners with PI with reading and writing difficulties* (Teacher 2).

The response indicates that some learners with PI who are not able to read or write without assistive devices do not access them due to inadequacy of these devices. Through observation checklist, it was revealed that the schools had no page turners and adapted keyboards for learners with reading and writing difficulties. This conforms to a study by Karandu (2014) which revealed that learners with PI lack relevant teaching/learning resources. Assistive devices help maintain or improve learners' functioning and independence to facilitate participation and overall well-being. They can also prevent impairments and secondary health condition. The study has shown that schools of learners with PI do not have adequate assistive devices. It implies that most learners with poor dexterity find it difficult to turn pages and may find difficulties in reading. Lack of adapted keyboards also makes it difficult for them to use computers in learning. It is therefore important for these schools to have adequate assistive devices such as page turners to help learners with reading and writing difficulties.

Regarding distraction of learners with PI, only 60 (41.1%) of the learners were satisfied with their learning environment as far as learning environment is concerned; they alluded that they do not

easily get distracted when learning. However, there is an indication that many of the learners with PI do not concentrate so much when learning since they easily get distracted in the classroom. This was evident by the response of the majority of the learners who affirmed that they easily get distracted when learning. This was revealed by a mean of 2.75 and a standard deviation of 1.48. This has implications on how teaching learning materials are displayed in classrooms.

Qualitative findings support the above findings, for instance; teachers were asked to say whether there were distractions in the classrooms for learners with PI. They responded as follows:

*Some seating arrangements in the classrooms do not allow learners with PI to access teaching learning materials easily (Class Teacher 4).*

*Some learning materials in classrooms are not well displayed...some materials in classrooms are not well arranged such that learners can manipulate them easily...some teachers also carry their phones during lessons even if they are not using them as teaching/ learning aids (Class Teacher 3).*

The observation checklist also revealed that most learning materials in classrooms are not well displayed as some are very close to the learners that they can play with them and hence may be distracted when learning. This conforms to a study by Oluremi and Olobukola (2012) which revealed that there was inadequate provision of learning materials which could be linked to academic performance, and a study by InnerDrive (2019) which revealed that presence of mobile phones can be linked to a 20% decline in performance and that a classroom display can be a source for learners' distraction, and that seating plans can cause distraction. The study results show that there are some distractions in the classroom. This means that most learners with PI do not concentrate when learning due to divided attention. These therefore need to be addressed.

Regarding comfort in learning, the results of the survey established that the learners are not very comfortable, as reflected with a mean of 2.75, though with a big variation from one learner to the other as interpreted by a standard deviation of 1.48. On the same note, although about a third 49 (33.5%) of them confirmed that they sit comfortably in class when learning, majority 76 (53.0%) of the learners held a contrary opinion reflecting a mean comfort of 2.57 with a standard deviation of 1.40.

A head teacher also supported the findings when asked if learners with PI sit comfortably in class. This was indicated using qualitative data as shown:

*Some adapted wheelchairs with adequate leg space are available in classrooms for learners with PI using wheelchairs, this makes them sit more comfortably in class. However, with the growing population of learners who need them, they are not adequate (Head teacher 1).*

The above interview excerpt reveals that even though some physical facilities are lacking, some facilities such as adapted wheelchairs are available for wheelchair users though not adequate as per the population. The direct observation revealed that the schools had adapted wheelchairs with adequate leg space which were helpful for learners with PI using wheelchairs but not adequate as compared to the population of learners who need them. This agrees with a study by Addo (2014) which revealed that most basic learners with mobility impairments have barriers such as lack of seats for wheelchair users. Inadequacy of adapted wheelchairs imply that these learners do not learn

comfortably due to pressure from their seat bones that adapted wheelchairs may help in relieving. This may make them not to be able to sit for long during lessons. This calls for provision of adapted wheelchairs to all learners who use wheelchairs for them to learn comfortably.

On infrastructure, the findings of the study revealed that most of the public primary special schools in Kisumu County generally have barely adequate (mean=2.77; SD=1.54) infrastructure, with only 65 (44.5%) of the respondents alluding that the infrastructure in their school is adequate for them to learn. More than a half 74 (50.7%) of the learners who participated in the study vehemently rejected the assertion that special schools have sufficient infrastructure for them to learn.

The qualitative data had the same view from teachers when they were asked about the adequacy of school infrastructure. One teacher responded as follows:

*The school infrastructure is generally inadequate for learners with Physical impairments due to poor physical access, such as very rough ramps to entries of most buildings in the school (Class Teacher14).*

The response indicates that learners with PI have different needs. The infrastructure and instructional materials that are available for them are inadequate since they cannot meet the individual needs of learners. According to observation checklist, there were inadequate infrastructure, this was evident by poor access to most entries in the school environment, such as entries to library, toilets, water points, canteens, pathways, and fire assembly points. This agrees with a study by Addo (2014) which revealed that most basic learners with mobility impairments have barriers such as steps, narrow doorways and desk space, lack of seats for wheelchair users, open gutters, slippery floors, spaces for maneuvering, and ramps in most schools don't meet the international standards. It also conforms to a study by Maingi (2016) which revealed that learners with PI lacked adopted classrooms. This means that the school environment is not well adapted to meet learners' needs hence learners with PI are not able to access the learning environment to learn with ease. The school infrastructure should therefore be adapted to suit learners needs.

Equally, the results of the survey established that most of the schools suffer low (mean=2.59) adequacy of instructional materials. This was revealed by 44 (30.1%) and 44 (30.1%) of the sampled learners who strongly rejected and rejected, respectively, the claim that there are adequate instructional materials in their special schools.

The following interview excerpt from teachers support the same statement when they were asked to say whether the instructional materials in school are adequate:

*The instructional materials in the school are not adequate with regards to learners' population and their diversified needs (Class Teacher 9).*

*Some instructional materials for learners with PI are available but too old, also, the learners have to share some of them during lessons.....If more than 3 classes are using them, then other classes which also need to use them have to wait (Class Teacher 1).*

The responses indicate that learners with PI have different needs. The instructional materials that are available for them are inadequate since they cannot meet the individual needs of learners. According to observation checklist, there were inadequate instructional materials, and this was evident by the available instructional materials versus the number of learners with PI who use them, indicating their inadequacy. This finding conforms to the findings of a study by Muendo (2016)



which revealed that schools do not have adequate physical facilities which negatively affect their academic performance. Similarly, the finding conforms to a study by Karandu (2014) which revealed that learners with PI lack relevant teaching/learning resources. This implies that most learners with PI are disadvantaged when it comes to use of instructional materials as far as learning is concerned. The schools should therefore ensure that there are adequate instructional materials for learners with PI.

#### 4.2.: Hypothesis Testing: Objective 1

To investigate whether there was any significant relationship between physical facilities and academic achievement of learners with PI, the null hypothesis was tested as follows:

**H<sub>01</sub>:** *There is no statistically significant relationship between physical facilities and academic achievement of learners with PI in public primary special schools in Kisumu County.*

In order to test the null hypothesis, a Pearson Product Moment Correlation Coefficient was computed with scores on physical facilities as independent variable and academic achievement as dependent variable. The scores of independent variable (use of physical facilities) were computed from frequencies of responses by computing mean responses per respondents. Mean response across a set of questions of Likert scale responses in each item was computed to create an approximately continuous variable, within an open interval of 1 to 5, that is suitable for the use in parametric methods, as explained by Johnson & Creech (1983) and Sullivan & Artino (2013), where high scale ratings implied high perceived physical facilities in public special schools of learners with physical impairments. The overall academic achievement was computed from the mean average scores of the learners in the three exams that were administered to them for third term 2018, first term 2019 and second term 2019.

The significant level (p-value) was set at .05, where, if the p-value is less than 0.05, the null hypothesis would be rejected and conclusion reached that a significant difference exists. However, if the p-value is larger than 0.05, it would be concluded that a significant difference does not exist.

Table 4.2 shows the SPSS output correlation analysis results.

**Table 4.2: Relationship between Physical Facilities and Academic Achievement**

		<b>Academic Achievement</b>
Physical facilities	Pearson Correlation	.363**
	Sig. (2-tailed)	.000
	N	146

From Table 4.10, the finding of the study shows that there was statistically significant positive correlation between physical facilities and academic achievement (n=146; r = .363; p<.05). Since p-value = 0.000 < 0.05, the null hypothesis that “*there is no statistically significant relationship between physical facilities and academic achievement of learners with PI in public primary special schools*” was rejected. Therefore, there exists enough evidence to conclude that there is statistically significant relationship between physical facilities and academic achievement among learners with PI in public primary special schools for learners with PI, with high level availability, adequacy,

accessibility and usage of physical facilities associated to improved academic achievement and vice-versa. The finding is consistent with a study by Oluremi and Olubukola (2012) which found out that there was a significant relationship between availability of facilities and academic performance of learners with special needs. However, the finding does not agree with Ibra, Umar and Igbaji (2017) which found out that there is no statistically significant relationship in the areas of facilities and academic achievement.

Qualitative findings from a teacher when asked to say whether physical facilities are associated with learners' with PIs' academic performance was as shown:

*Lack of adequate physical facilities makes it difficult for learners with physical impairments in our school to learn effectively and perform according to their standards (Class Teacher 1).*

The teacher above is of the opinion that learners with PI who access adequate physical facilities tend to perform well academically. This conforms to a study by Figueroa, Lim and Lee (2016) which revealed that schools with basic facilities have performed better than schools with poor facilities. This implies that access to physical facilities by learners with PI is linked to their academic achievement, hence need for adequate and accessible physical facilities in schools for learners with PI.

However, to estimate the level of influence of physical facilities on academic achievement, a coefficient of determination was computed using regression analysis and the result was as shown in Table 4.3.

**Table 4.3: Model Summary on Regression Analysis of Physical Facilities on Academic Achievement of Learners with PI**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.363 <sup>a</sup>	.132	.126		19.6383

a. Predictors: (Constant), Physical facilities

The model summary reveals that physical facilities accounted for 12.6%, as signified by Adjusted  $R^2 = .126$ , of the variation in academic achievement of learners with physical impairments. This finding implies that variation in the physical facilities explains about 13% of the variability in academic achievement of learners with physical impairment in public primary special schools. This is a fairly sizeable influence on a dependent variable by one predictor variable.

From qualitative findings, it was indicated that there was need to increase the number of physical facilities in schools for learners with PI as shown:

*Inaccessibility to most entries in the school environment, inadequacy of most physical facilities and most obstacles within the learning environment is a challenge as far as academic performance of our learners with physical impairments are concerned due to their mobility challenges (Class Teacher 6).*

From the interview excerpt, it is clear that the learning environment for learners with PI is not friendly and does not fully facilitate their learning. Physical facilities for learners with PI should therefore be improved. This conforms to a study by Akomolafe and Adesua (2016) which revealed that there was a significant relationship between physical facilities and learners' level of academic performance. This implies that inadequate physical facilities are connected to lower academic achievements and vice versa. Schools for learners with PI should therefore be provided with adequate physical facilities.

Table 4.4 shows the coefficients values of regression model of the influence of physical facilities on academic achievement.

**Table 4.4: Coefficients-Influence of Physical Facilities on Academic Achievement of Learners with PI**

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error				Lower Bound	Upper Bound
1 (Constant)	118.407	15.761		7.513	.000	87.254	149.560
Physical Facilities	28.250	6.049	.363	4.670	.000	16.294	40.207

**a. Dependent Variable: Academic Achievement**

$$Y = \alpha + \beta x + \varepsilon$$

$$\text{Academic Achievement} = 111.407 + 28.250x + \text{error term.}$$

From the model it is evident that the slope coefficient for physical facilities was 28.25, implying that academic achievement of learners with PI improves by 28.25 units for each one-unit provision, availability, adequacy, access and use of physical facilities in public primary special schools for learners with PI. Similarly, an improvement in physical facilities by one standard deviation is associated to improvement of academic achievement by .363 standard deviations. This finding is in line with Maingi (2016) which revealed that adequate physical facilities predict academic achievement. The findings imply that adequacy of physical facilities such as infrastructure, equipment, assistive devices, and teaching learning materials in schools for learners with PI are associated with the academic achievements of learners with PI. There is therefore need for schools of learners with PI to have adequate and accessible physical facilities.

However, to investigate whether physical facilities was really a significant predictor to academic achievement among the learners with PI in public primary special schools, Analysis of Variance was conducted, in line with the recommendation by Tabachnick & Fidell (2001), as shown in Table 4.5.

**Table 4.5: ANOVA-Influence of Physical Facilities on Academic Achievement of Learners with PI**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	8411.439	1	8411.439	21.810	.000 <sup>b</sup>
	Residual	55535.384	144	385.662		
	Total	63946.823	145			

a. Dependent Variable: Academic Achievement

b. Predictors: (Constant), Physical facilities

From the ANOVA output, there exists enough evidence to conclude that the slope of the population regression line is not zero, meaning physical facilities is a significant predictor of academic achievement,  $F(1, 144) = 21.810$ ,  $p = .000 < .05$ ; Adjusted  $R^2 = .126$ . Therefore, it was concluded that there is statistically significant influence of physical facilities on academic achievement. This implies that learners with PI who enjoy adequate physical facilities are likely to post better academic achievement. This is in line with a study by Muendo (2016) which revealed that inadequate physical facilities in schools negatively affect academic achievements of learners.

When teachers were asked to state whether physical facilities were of any importance as far as academic performance is concerned, the response was as shown:

*We are not dealing with just “normal” learners, our learners have physical challenges, their learning environment should be made barrier free for them to learn better, however, our school is not up to date as far as physical facilities are concerned (Class Teacher 8).*

From the interview excerpt, the teacher is of the opinion that availability and adequacy of physical facilities for learners with PI is associated to a better academic performance. This finding conforms to findings from a study by Ramil and Mohd (2020) which revealed that physical facilities were associated to learners' achievement. This implies that adequate physical facilities are essential for learners with PI. Schools of learners with PI should therefore be well equipped with physical facilities.

## 5.0 Conclusions and Recommendations

### 5.1 Conclusion

The study sought to determine the relationship between physical facilities and academic achievement of learners with PI in public primary special schools for learners with PI in Kisumu County Kenya. From the current study findings, it was established that the special schools for learners with PI have inadequate and inaccessible physical facilities. These include infrastructure, specialized equipment, instructional materials and assistive devices. It was concluded that; there was a statistically significant positive relationship ( $r = .363$ ) between physical facilities and academic achievement of learners with PI. It can therefore be concluded from the current study that there is a statistically significant relationship between physical facilities and academic achievement of learners with PI, and that physical facilities are significant predictors of academic achievements of learners with PI in public primary special schools.

## **5.2 Recommendations**

In accordance with the findings that physical facilities are significant predictors of academic achievement of learners with PI, and that there is a statistically significant relationship between physical facilities and academic achievement of learners with PI in the current study, the following recommendations may be useful as far as academic achievement of learners with PI is concerned:

(i) The government and stakeholders should ensure that there is availability, adequacy and accessibility of school infrastructure in schools for learners with PI. This will make learning easier as well as accomplishing physiological and safety needs.

(ii) The government should ensure that there is availability, accessibility, and adequacy of instructional materials to enhance learning.

(iii) The government and stakeholders should ensure that there is availability, adequacy and accessibility of specialized equipment in schools for learners with PI. This will make learners with PI to operate more comfortably in the learning environment.

(iv) The government and stakeholders should ensure that there is availability, adequacy and accessibility of assistive devices in schools for learners with PI. This will make learning easier for learners with PI as well as accomplishing physiological and safety needs.

(v) The stakeholders should ensure that physical facilities are adapted to suit the needs of learners with PI's needs.



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