

**SCHOOL INFRASTRUCTURE UTILIZATION AND STUDENTS' ACADEMIC  
PERFORMANCE OF SECONDARY SCHOOLS IN KAJARA COUNTY,  
NTUNGAMO DISTRICT**

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## **DECLARATION**

I, Doreen Ahumuza, declare that this is my original work and has never been submitted for any award in any Institution.

Sign:.....

Date: .....

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## **APPROVAL**

This is to certify that this dissertation has been done under our close supervision and is now ready for submission with our approval.

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### **DEDICATION**

I dedicate this dissertation to Mr Edmond Kamugisha and my Parents, Mr. and Mrs. Godfrey Muhanguzi for their financial support and offering reassurance throughout the process. I would not have accomplished this without their support and understanding.

## **ACKNOWLEDGEMENTS**

This work is not the result of my efforts alone but a good number of people contributed towards its accomplishment. First of all, I want to thank the almighty God, for it is not because of my might that I have completed this study, but because of his power and his tender care. May his name be glorified forever!

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## **ABSTRACT**

The study examined the influence of school infrastructure utilization on learners' academic performance in Kajara county, Ntungamo District. The study was guided by the following objectives: to examine how physical infrastructure affects students' performance in Kajara county, Ntungamo District; to establish how co-curricular infrastructure affects students' performance in Kajara county, Ntungamo District; and, to analyze how health and sanitation infrastructure affects students' performance in Kajara county, Ntungamo District.

The researcher used a cross-sectional survey design with both qualitative and quantitative approaches. The study population consisted of head teachers, teachers, health workers and students from candidate classes. A sample size of 148 respondents consisting of 6 head teachers, 6 health officers, 118 students and 18 teachers. The study used both questionnaires and interviews as methods of data collection. After quantitative data was collected, edited, coded and then entered on computer using the Statistical Programme for Social Scientists (SPSS). The relationship between the independent and dependent variable was tested using the Pearson product moment correlation coefficient. Thematic analysis was used during qualitative data analysis.

The study found out that there is a strong positive correlation between physical infrastructure and students' academic performance. This confirms that when the school has sufficient physical infrastructure, there is a high possibility of performing highly academically. The study found out that there is a weak but significant relationship between co-curricular facilities and students' academic performance. This shows that even when co-curricular facilities are important towards influencing students' academic performance, their influence largely depends on other factors. The study further found out that there is a strong positive correlation between health and sanitation facilities and students' academic performance. This is an indication that sanitation facilities in secondary schools have a strong bearing towards influencing students' academic performance. It can therefore be concluded that there is a strong significant relationship between physical infrastructure, co-curricular facilities, sanitation facilities and students' academic performance in secondary schools in Kajara County, Ntungamo District. The study recommended that the government should allocate more funding to public secondary schools for construction of adequate learning physical facilities while private secondary schools should be compelled to do so.

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.0. Introduction**

This study examined the effects of school infrastructure utilization on learners' academic performance in Kajara county, Ntungamo District. Provision of quality education has for long been one of the top priorities for the Government of Uganda. In order to achieve this, the Government came up with a number of interventions aimed at, among other things, providing additional and better infrastructure for learning. One of such interventions was the Development of Secondary Education (DSE) programme. This programme provides infrastructure in form of classrooms, administration blocks, libraries, dormitories, toilets, and teachers' houses for both existing and new schools. The programme is implemented by the Ministry of Education through individual schools across the country with each of them playing separate but complementary roles (Ahimbisibwe, 2009). Despite such programmes in place, learners' performances have continued to be a challenge, thus requiring scholarly attention; hence the urgency of this study. This chapter presents the background of the study, statement of the problem, purpose of the study, objectives of the study, research questions, scope and significance of the study.

### **1.1. Background of the study**

#### **1.1.1 Historical Perspective**

The development of any country is directly proportional to the level of development of its education system (Hanushek, 1997). A lot depends on how much attention the country pays to education. The major purpose of education is to educate all citizens and give everyone adequate opportunity to succeed in life (Hanushek, 1997). It is important to note that through knowledge and skills, all individuals can achieve greatness (Mazurek et al., 2000). It is generally agreed that the more knowledge and skills a person acquires, the better are the chances of achieving informed mobility (Rost, 2016). There is hardly any factor in society that is as formidable as education. Aristotle, in reference to society, once said that the educated differ from the uneducated, as much as the living differs from the dead (Di Leo, 2007). Education deals with knowledge that is recognizably worthwhile and capable of achieving a voluntary and committed response and it leads to new mental perspectives (Farrant, 2016).

In both developed and developing nations, education is a very crucial process through which an individual's life chances are determined. Beyond the economic significance, education is viewed as a good in itself and indeed a basic human right with regard to the lower level of education (World Bank, 2015). Education is a universal investment in human beings and a value resource for economic benefit of the country. Governments all over the world committed themselves to the provision of Education for All (EFA) at Dakar, Senegal in 2000 (UNESCO, 2003).

Education does not exist in a vacuum but in an environment structured of physical facilities and material resources that are used in teaching and learning. The specifications given for the establishment, management and material resources in public secondary schools are stipulated in the laws and policies that govern the country's education system. The goal of infrastructure system in secondary schools seeks to increase school attendance of students, enhance staff motivation and to improve academic achievement of students (Alimi, 2004). There is a link between school architecture and its users (students and teachers). Research has shown that a well-planned school with clean and safe learning environment is important for academic achievement (Cash, 2016; Earthman & Lemaster, 1996). Physical facilities play a key role in the attainment of the school's intended objectives and overall quality performance in national examinations. Secondary schools are often characterized by lack of infrastructure facilities such as adequate classrooms, latrines, hostels and laboratories.

School education was introduced in Uganda by missionaries from Europe in the late nineteenth century, mainly by the Church Missionary Society, the White Fathers, the Mill Hill Fathers, and the Comboni Missionaries (Aguti, 2002; Ssekamwa, 2014). They first educated the sons and daughters of chiefs, who would later work as clerks and other civil servants. Whereas, Aguti (2002) insinuates that the purpose of those missionaries was not to educate all, but for children of chiefs; the Education Policy Review Commission Report (1989), in contradiction, shows that there were some mission schools which provided equal opportunity to children from all corners of society. This point is stressed by Ssekamwa (2014) who points out that in an effort to eradicate illiteracy, missionaries started church schools wherever they established a mission or in its outstations. This is further emphasized by the Uganda Episcopal Conference Education Policy (1997), which reiterates that in Uganda, formal school education was initiated by religious denominations to eradicate ignorance from society.

It is those church schools that later evolved into the present church-founded primary schools. As stressed by the Education Policy Review Report (1989), most of the children attended small rural schools, called Church Schools, unsupported by government. In support to the aforementioned argument, Ssekamwa (2014) notes that “unfortunately, there was little financial support by the colonial government for the missions in their educational work” (p. 302). However, the colonial government was not fully detached from the financial management of the schools. The same author, in this regard, furthermore observes that “throughout the colonial era, missionaries controlled the system of education but governments were mainly concerned with grants to aid running the mission schools”.

There were efforts by the colonial government in Uganda to establish rules and procedures of educating the Ugandans right from the missionary days. The British Colonial Policy in 1923 advised the British colonial administrators in Uganda to provide education for the African child. Soon after, the American sponsored Phelps-Stokes Commission of 1924-1925 was set up to assess the development of education in Uganda, where the Department of Education was established under the direction of Eric Hussey (Ssekamwa, 2014). Thereafter, better schools were built, teacher training and grading were introduced and grants from government were formalized. However, the significant state financing of education, according to Magara (2009), started in 1940 where the Thomas Education Committee recommended the involvement of governments in grant-aiding schools.

In 1937, the De La Warr Commission recommended Makerere to be developed as a regional university college, serving the British East African territory. The interest of government then was to get so many African workers. That was why the Binns Commission of 1951 encouraged rapid growth of education in Uganda (Education Policy Review Commission Report, 1989). However, that type of education was not favourable to national development. Ssekamwa (2014) intimates that “the main aim was to produce white-collar workers, whose pre-occupation was to seek already created jobs, instead of creating new jobs” (p. 307). However, in 1953, the Report on African Education in Uganda, drawn up by a committee chaired by Bernard de Bunsen, gave emphasis to Africanization of education and the training of high level personnel needed for the country’s economic development (Education Policy Review Commission Report, 1989).

In 1963, the Uganda Government appointed a Commission under the chairmanship of E. B. Castle and the commission proposed the merging of primary and junior secondary schools. At primary level, it placed emphasis, not only on quantitative expansion, but also on quality. The Castle Commission also underlined the need for expanding girls' education. The government instituted another commission in 1977, under the chairmanship of Senteza Kajubi, to review the education system in Uganda. But, the report of the said Kajubi Commission was not published, and its recommendations were not implemented because of the liberation war of 1978-1979. Consequently, since independence, the structure of education in Uganda has been according to the Castle Commission Report on Education in Uganda of 1963, with a few policy reforms. Therefore, as Juuko and Kabonesa (2007) argue, the present structure of education in Uganda has been in existence since missionary days, but particularly since 1965, following the recommendation of the said Castle Education Commission Report on Education. This reflects how outdated the system is, thus crying for revision and updating.

The introduction and implementation of Universal Primary Education, (UPE) in 1997 in Uganda as a means of meeting the second of the eight Millennium Development Goals (MDGs), led to high demand for Secondary education (Uganda Education Statistical Abstract, 2009). The World Bank education report for African countries shows that academic performance in Uganda has been very low for the previous decades and this appears to be affected by the quality of school infrastructural facilities, although a lot has been done on enrolments and access to Secondary School education. Academic performance in most Secondary Schools in Uganda has been challenged by a crisis of high School dropouts and low performance (UNESCO, 2008). However, in the past decades no one has ever established the influence of School infrastructure on students' academic performance in Kajara county, Ntungamo District.

### **1.1.2. Theoretical perspective**

This study was based on Classical Liberty Theory advanced by Rousseau between 1712 and 1778. The classical liberty theory states that each person is born with a great amount of capacity to perform better. Thus the educational system should be designed so as to remove barriers of any nature (institutional or infrastructural) in a person's life. The classical liberal theory also states that social mobility will be promoted by providing equal opportunity to education access.

According Rousseau (the theory proponent), personality qualities should not jeopardize social equity so long as society rewards people according to their status. It follows those social

institutions such as education institutions should attempt to create an enabling environment by having the infrastructural facilities needed to excel in academics. The education institution should treat people equally by providing the needed facilities and people should take advantage of education opportunities and perform better in their examinations. There is therefore need to ensure students from all part of the country get the needed physical infrastructure to guarantee equal opportunities to education access which will later improve their living standards and thus improved academic performance. Classical Liberty Theory is useful in understanding how learning is achieved through successful student-resource interactions. The author adds that the theory is also useful in understanding the impacts of infrastructural resources on students' academic outcomes. The current study therefore seeks to assess the relationship that exists between school infrastructure and students' academic performance in selected schools of Kajara county Ntungamo District.

### **1.1.3 Conceptual perspective**

In this study, school infrastructure utilization is the independent variable and academic performance is the dependent variable. Students' performance is defined as the ability of students to attain something (Oxford Advanced Learners Dictionary, 2014) while academic performance refers to the quality and quantity of knowledge, skills techniques and positive attitudes, behaviour and philosophy that learners achieve or acquire (Ferguson, 1990). This ability is evaluated by the marks and grades that the students attain in a test or examination which is done at the end of a topic, school term, year or education cycle. The scores and grades that each student obtains measure the degree of achievement. The quality of the grade and the number of candidates who pass in various grades determine the level of academic performance in a given class or institution in a given period in a particular examination, be it internal or public (Ferguson, 1999).

Academic performance in this study was perceived as the quality and quantity of knowledge, skills, techniques and positive attitudes, behaviour and philosophy that learners achieve or acquire (Ferguson, 1990). This ability is evaluated by the marks and grades that the pupils attain in a test or examination which is done at the end of a topic, school term, year or education cycle. The scores and grades that each pupil obtains measure the degree of achievement.

In this study, school infrastructure was used as the independent variable. School infrastructure is generally defined as the set of inter-connected structural element that provide a framework

supporting an entire structure of development. For purposes of the study, the researcher will concentrate on physical infrastructure, Health and sanitation infrastructures as well as Co-curricular facilities and will concentrate on physical infrastructure and the main focus was on the quality of libraries, laboratory and quality of classrooms. Crowded classroom conditions not only make it difficult for learners to concentrate but inevitably limit the amount of time teachers can spend on innovative teaching methods such as cooperative learning and group work. Co-curricular facilities are those infrastructures that are meant to bring social and physical adjustments in a child. These include fields, recreation centres, and rooms for indoor games among others.

Good sanitation is where the environment is clean concurring with the School Sanitation Consultative Meeting Report (1999) which defined it as personal and universal cleanliness. Personal cleanliness involves food hygiene practices, safe disposal of solid and liquid waste, safe collection, storage and use of clean water especially for drinking. Good sanitation therefore is cleanliness of toilets and bathrooms, cleanliness of the drainage system, access to hand washing facility and the good state of dustbins.

Co-curricular facilities are those infrastructures that are meant to bring social and physical adjustments in a child. These include fields, recreation centres, rooms for indoor games among others.

#### **1.1.4 Contextual perspective**

A report from the Ntungamo District Education Office (2008) shows that secondary schools in Ntungamo have an imbalanced provision of educational physical facilities. It is common to have schools with class sizes up to between 80-100 students. In some schools, there are inadequate classrooms, staff offices, laboratories, toilets, and libraries. Some classes lack well fitted doors and window-panes, while others have leaking roofs, earthen and dusty floors. Many schools appear to suffer from inadequate maintenance and have dusty compounds that are likely to be hazardous to the health of learners and teachers (Kajubi, 2012). This situation seems not to provide quality learning environment and therefore may have direct or indirect impact on the teaching and learning process and eventually, negatively effecting students' academic performance.

Records from Ntungamo District Statistics Office (2010) indicate that secondary schools in the district perform with desired results in national examinations. In a recent report of 2017 by the *Daily Monitor* newspaper, it was reported that Ntungamo District in western Uganda was among the poor performers in the country, with nearly 30 per cent of the total students failing the exams. Out of the 12,328 candidates who sat for UCE exams, only 770 passed in division one. Several reasons that have contributed to poor performance were given. These include inadequate provision of quality educational facilities, and poor planning of educational physical facilities. Therefore, the school managers and parents need to be informed about the conditions of their school infrastructural facilities in order to appreciate the difference these facilities could make in the quality of education acquired by their children (Tiberondwa, 2012). Hence there was need for the researcher to ascertain the role of school infrastructure utilization on learners' academic performance in Kajara county, Ntungamo District.

## **1.2. Statement of the problem**

School infrastructure is an essential part of secondary schools in realizing the objectives of education. A good school infrastructure environment includes: building in good shape including an adequate number of well-organized classrooms, sufficient blackboards, tables, desks, benches, chairs, and adequate number of sanitation facilities, access to adequate clean drinking water, electricity, ventilation and light, fire exits and first aid kit, medical assistance, canteen, sufficient recreation ground, library, laboratory, computer facilities (UNESCO, 2010). Government increased its funding to schools with the Uganda Education Sector Investment Plan making it mandatory that not less than 65% of the education budget must fund infrastructure development (Kakaire, 2018). This notwithstanding, however, many reports have continued to reveal poor students' academic performance despite government's continued commitment and investment in education (Tugineyo, 2018). The situation seems to worsen year by year as evidenced by NAPE findings (NAPE Reports, 2018). Most schools in Kajara county, Ntungamo District have endeavoured to have the above infrastructural facilities in place; however, the District has continued to witness declining performance as indicated by nearly 30 per cent of the total students failing UCE exams in 2018. Out of the 12,328 candidates who sat for UCE exams, only 770 passed in division one (Rugyendo, 2018). This is blamed on the quality of school infrastructure. Inadequate school infrastructure may cause irritation and friction while a planned infrastructure is a centre of satisfactory students learning that leads to the improvement of academic performance (Frederick, 2016). Basing on the above background

the researcher intended to establish the role of school infrastructure utilization on learners' academic performance in Kajara county, Ntungamo District.

### **1.3. Purpose of the study**

The purpose of the study was to examine how utilization of school infrastructure influences learners' academic performance in Kajara county, Ntungamo District.

### **1.4. Objectives of the study**

- i. To examine how physical infrastructure influences students' performance in Kajara county, Ntungamo District;
- ii. To establish how co-curricular infrastructure influences students' performance in Kajara county, Ntungamo District;
- iii. To analyse how health and sanitation infrastructure influence students' performance in Kajara county; Ntungamo District.

### **1.5. Research questions**

- i. How does physical infrastructure influence students' performance in Kajara county, Ntungamo District?
- ii. How does co-curricular infrastructure influence students' performance in Kajara county Ntungamo District?
- iii. How does health and sanitation infrastructure influence students' performance in Kajara county, Ntungamo District?

### **1.6. Scope of the Study**

#### **1.6.1. Content Scope**

The study was guided by the following objectives: to examine how physical infrastructure affects students' performance in Kajara county, Ntungamo District; to establish how co-curricular infrastructure affects students' performance in Kajara county; Ntungamo District; and to analyse how health and sanitation infrastructure affects students' performance in Kajara county, Ntungamo District.

### **1.6.2. Geographical Scope**

The study was carried out among selected Secondary schools in Kajara county, Ntungamo District. The general coordinates of the District are: 00 53S, 30 16E. The district covers 2,051.4 square kilometres (792.0 sq miles) of which approximately 0.2% is open water, 3.4% is wetland and about 0.01% is forest. The area has been chosen due to increasing failure among learners.

### **1.6.3. Time scope**

The study utilized information for the period from 2015 to 2019. This reference period helped in establishing the role of school infrastructure utilization on learners' academic performance in Kajara county, Ntungamo District. This is the period that has witnessed declining students' performance in the area and the researcher expected to get up to date information pertaining to the study variables. According to 2015, 2016 and 2017 MOES reports, this district has some of the best and worst academic performing schools in Uganda ((Tugineyo, 2018).

### **1.7. Significance of the study**

It was hoped that this study finding would be useful to the school management committees because they might use the findings to provide the necessary physical infrastructure such as library, laboratory, classrooms and sanitation facilities, among others, to enhance academic performance of Secondary Education in the area.

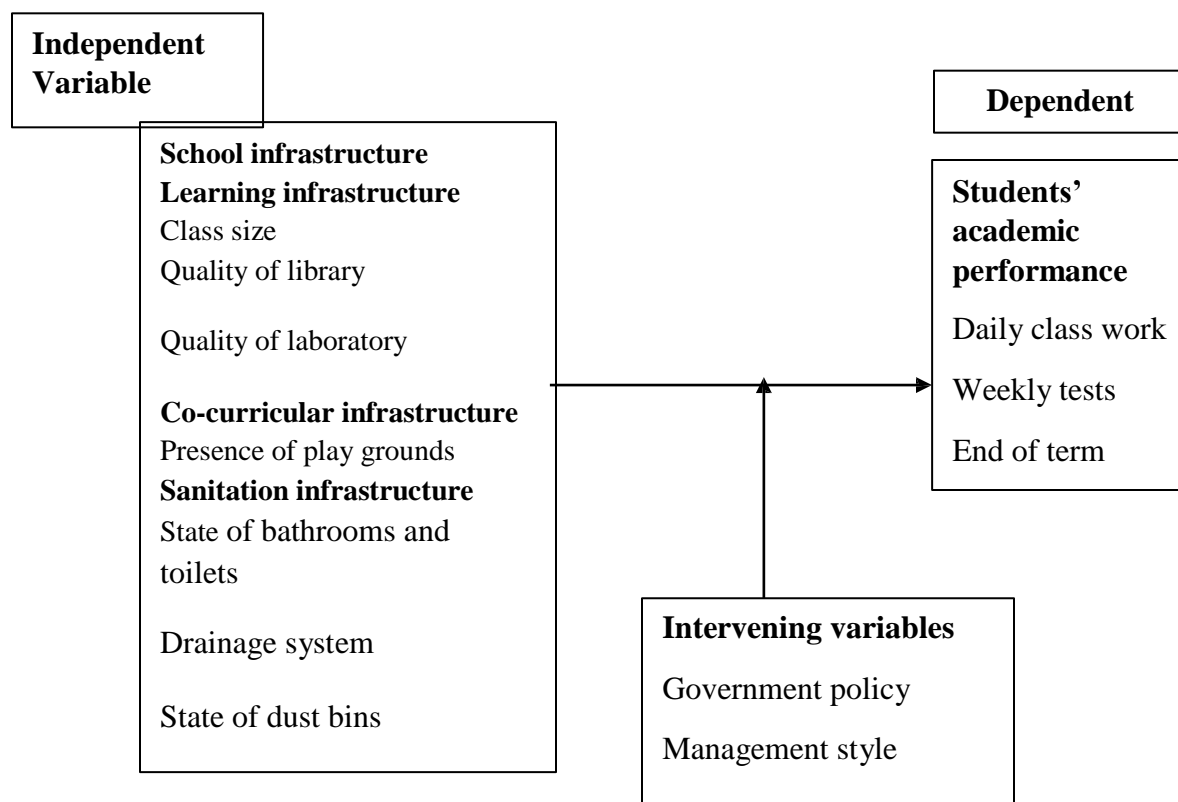
The study findings would also give suggestions which might be used in the formulation of necessary policy statements through its recommendations on availability of physical infrastructures in schools. Such recommendations would help the school administration and management committees to prioritize and avail the necessary infrastructure which would be used in improving students' academic performance.

The findings of this study would provide useful information for head teachers and Board of Governors (BOG) and Parents and Teachers Association (PTA) as stakeholders to know the infrastructures which affect student performance in school. The findings of this study would form a basis for further researchers who might be interested in advancing this study on the other regions of the country.

## 1.8. Conceptual Framework

Figure 1.I: Conceptual framework relating School Infrastructure and Students' Performance

### Figure 1.1: Conceptual Framework



**Source: Adopted from Ndiku and Mualuko (2009) and modified by the researcher**

The school infrastructure was an independent variable conceptualized into: physical learning infrastructure, Co-curricular infrastructure, sanitation infrastructure; and learners' academic performance was a dependent variable conceptualized into; Daily class work, weekly tests and end-of-term; and the extraneous variable identified were management style and government policy.

## **1.9. Definition of key terms**

**School infrastructure:** This is generally defined as the set of inter-connected structural elements that provide framework supporting an entire structure of development.

**Student's performance:** This is defined as the ability of students to attain something.

**Academic performance** refers to the quality and quantity of knowledge, skills techniques and positive attitudes, behaviour and philosophy that learners achieve or acquire (Ferguson, 1990).

**Co-curricular facilities** are those infrastructures that are meant to bring social and physical adjustments in a child.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter presents a review of literature regarding school infrastructure utilization and students' academic performance. Different sources of data including but not limited to journal articles, textbooks, theses, dissertations and reports from the Ministry of Education and Sports were used.

#### **2.1. Actual review of literature**

##### **2.2.1. Physical Infrastructure and Students' Academic Performance**

In a school environment, learning infrastructure includes classrooms, laboratories and libraries. Fisher (2006) conducted research on the impact of school infrastructures on student outcomes and behaviour in Georgia and established that academic achievement improves with improved building conditions, lighting levels, air quality and temperatures. He further established a correlation between school class size and student achievements. Having large classes can affect students' achievements. Mark (2014) in a study of factors affecting learners' performance in schools in Canada, maintained that one cannot expect high level of students' academic performance where school buildings are poorly located and substandard. He emphasized that well planned structures, clean, quiet, safe, comfortable and healthy environment are important components of successful teaching and learning.

Sanoff (2009), in his research on school building assessment methods, says that school buildings have an impact on the mental development of a student. He explains that schools that are properly build and attractive to look at motivated the children to stay in school and learn as well. A study by Chiriswa (2014) showed that schools that rarely perform well in national examinations cause their students to be de-motivated to work hard and hence lose hope in pursuing higher education. Students from schools that perform well in national examinations have their students motivated to work hard and often focus their energies towards attaining good grade in school. Okoye and Uche (2004) stated that education is an equalizer where those who do well in schools are economically rewarded regardless of their economic background, while those who do not do well are not rewarded. Kibui (2011) commented that education throughout the world has for many centuries emphasized a selective function regardless of available infrastructure in schools.

A number of studies have shown that many school systems, particularly those in urban and high-poverty areas, are plagued by poor planned infrastructures, decaying buildings that threaten the health, safety, and learning opportunities of students. Good facilities appear to be an important precondition for student learning, provided that other conditions that support a strong academic programme in the school are present. "Learning environment" is a term used liberally in educational discourse because of the emerging use of information technologies for educational purposes on the one hand, and the constructivist concept of knowledge and learning on the other (Mononen-Aaltonen, 2008). The concept of the physical learning environment with respect to physical structures relates to spaces, equipment and tools within the school.

A study by Lackey (2011) in overcrowded schools in New York City found that students in such schools scored significantly lower on both mathematics and reading examinations than did similar students in under-utilized schools. In addition, when asked, students and teachers in overcrowded schools agreed that overcrowding negatively affected both classroom activities and instructional techniques. Laboratories and technical workshops are essential in the teaching and learning process. The extent to which these infrastructures could enhance quality education depends on their location, their structures and facilities available in them. It is not unlikely that well planned learning infrastructures in terms of location, structures and facilities will facilitate the teaching and learning process and enhance good academic performance of the students (Ayaji, 2007).

A good infrastructure indicates a good school. A good infrastructure includes building in good shape of benches, chairs, access to drinking water, electricity, ventilation and light, fire exits and first aid kit canteen and computer facilities (UNESCO, 2012). Classroom Infrastructure facilities can be either permanent or temporary structures. The structures should be appropriate, adequate and properly located, devoid of any risks to users or to those around them. They should also comply with the provisions of the Education Act (Cap 211), Public Health Act (Cap 242) and Ministry of Public Works building regulations/standards. The school should ensure classrooms are clean, well maintained, safe and properly utilized (Ministry of Education, 2008). It is important to observe the above with regard to the various types of school buildings.

According to Oni (1992), facilities constitute a strategic factor in organizational functioning. This is so because they determine to a very large extent the smooth functioning of any social

organization or system including education. He further stated that their availability, adequacy and relevance influence efficiency and high productivity. In his words, Farombi (1998) attested that the wealth of a nation or society could determine the quality of education in that land; emphasizing that if a society that is wealthy, has established good schools with quality teachers, and other learning infrastructures, students may learn with ease thus bringing about good academic achievement.

Writing on the role of facilities in teaching, Balogun (2016) submitted that no effective science education programme can exist without equipment for teaching. This is because facilities enable the learner to develop problem-solving skills and scientific attitudes. In his contribution, Ajayi (2007) reiterated that when facilities are provided to meet relative needs of a school system, students will not only have access to the reference materials mentioned by the teacher, but individual students will also learn at their own paces. The net effect of this is increased overall academic performance of the entire students.

A comparative study done in different schools in India (OECD, 2011) on students attending school with high quality infrastructure, with those in schools with poor infrastructure found out that students who enjoy good quality school infrastructure were in contact with teachers, involvement in class was high, they had good learning process and their well-being was good, all of which affected academic performance of students. The study concluded that school infrastructure definitely contributes to well-being of students which improves academic performance.

Chan (1996) conducted a similar study of the impact of physical infrastructure on students' performance. Chan (1996) concluded that technology and adaptabilities of physical infrastructure equipped students better for success and that to ignore that fact was to disregard the physical difficulties of learning. On classroom size, studies have shown that students in larger classes may perform more poorly if the resulting reduced motivation leads to increased absenteeism. However, such issues have not been empirically tested. Teaching is generally assumed to be a public good; however, as Bonesronning (2003) points out, there are also private good aspects. As classroom size is reduced, instructors have a greater chance to provide students with individual attention and can respond to the reduced class size by reallocating resources towards low-achieving students or by adopting teaching methodologies geared towards student needs

(Behangana, 2017). The impact of classroom size on achievement can therefore be ambiguous, depending on the instructor's teaching method and student motivation. A well planned and organized layout of physical classroom infrastructure does much to banish apathy, supplement inadequacy of books as well as arouse students' interest by giving them something practical to see, do and at the same time helping to train them to think things out themselves.

A study by Musyoka (2013) on the influence of provision of school physical classroom infrastructure on students' performance in KCSE in Mwingi Central, Kitui County, Kenya, found out that schools do not have adequate facilities which negatively impacts on their academic performance. A study by Kiplagat et al. (2013) on factors contributing to poor academic performance in KCSE in secondary schools in Kericho sub county found out that 56.6% disagreed while 43.4% agreed that school classroom infrastructure affect academic performance. According to the study, to some extent, infrastructure does not affect academic performance. Juma (2011) links performance in examinations to state of teaching and learning resources in schools. He notes that students from poor backgrounds perform poorly in the examinations because the poor are often in areas where schools are seriously deprived of vital facilities like classrooms, an attitude of helplessness may be inculcated early into children making them feel that being in school is a waste of time.

The educational process functions in a world of books. The chief purpose of a school library is to make available to the students, at their easy convenience, all books, periodicals and other reproduced materials which are of interest and value to them but which are not provided or assigned to them as basic or supplementary textbooks. The importance of a library has been demonstrated by the government when it expressed in the National Policy on Education (NPE) that every state Ministry needs to provide a library. Fowowe (2017) clarifies that a library must be up-to- date and at the same time have older materials. It must be properly supported financially to fund materials and services, among others. He concluded that a well equipped library is a major facility which enhances good learning and achievement of high educational standards.

In his words, Farombi (1998) reiterated that school libraries may not be effective if the books therein are not adequate and up-to-date. Its impact may only be meaningful if the library could always be opened to the students for a considerable length of time in a school day. With all the above mentioned facts, it is sad to know that many schools operate without libraries

(Shodimu, 1998). Ogunseye (2015) had earlier noted that the total absence of an organized school library would continue to spell a doom for thousands of secondary school students. This statement clearly implied that many schools operate without libraries and this had affected the academic performance of their students.

Moreover, Fuller (2017) identified a school library as an instructional resource which may significantly influence students' achievement after controlling for students' family background. He found out that one effect of library size and its activity have been positive in 15 out of 18 analyses. Those schools with well-equipped libraries normally maintain high academic performance. In another study on raising school quality in developing countries, Fuller (2017) found out that the collection of books kept for reading in the library is related to performance.

A study by a Scholastic Research Foundation (2008) on school libraries work to provide overview of library research studies, found out a correlation between student achievement on standardized tests and school libraries. The study attested that Library media specialists play an essential role in the learning community by ensuring that students and staff are efficient and effective users of ideas and information. The study also found out that effective school libraries are much more than books. They are learning hubs, each with a full range of print and electronic resources that support student achievement. In addition, when library media specialists work with teachers to support learning opportunities with books, computer resources, and more, students learn more, get better grades, and score higher on standardized test scores than their peers in schools without good libraries.

A study by Ango (2015) found out that laboratory work stimulates learners' interests as they are made to personally engage themselves in useful scientific activities and experimentation. Science is not only products or processes. It affords the learner the basic skills and scientific method of problem solving, and knowledge obtained through laboratory work promotes long-term memory. Nwachukwu (1984) discovered in her survey of the resources for the teaching and learning of Biology in some of the new secondary schools in Lagos that there was a general inadequacy of resources. She also found out, among other things, that (a) out of 80 per cent of the old schools that accepted as having laboratories, none had a well-equipped laboratory and (b) 40 % of the schools had no laboratory at all, while the remaining 60 % had rooms' labelled "laboratory" without adequate apparatus. She concluded that teaching of Biology practical would be difficult and that students learning experiences would be limited.

In his contribution, Balogun (2016) admitted that no effective science education programmes can exist without equipment for teaching. Writing on the situation of our secondary schools today, Okoli (2015) reported that laboratories have become shelves of empty bottles without chemicals. In terms of academic achievement, Soyibo and Nyong (1984) have shown that schools with well- equipped laboratories have better results in the school certificate science examinations than those that are ill-equipped. Yadar (2011) observed that no course in science and mathematics can be considered as complete without including some practical work. The practical work ought to be carried out by individuals either in science laboratories or in classes. At school level, practical work is even more important because of the fact that we learn by doing.

### **2.2.2. Co-Curricular Infrastructure and Students' Academic Performance**

Co-curricular infrastructure include fields, music rooms, theatre rooms, among others, which help the students to participate in different activities that aid the learner in developing physically, socially mentally and emotionally (Ng'anga, 2003). The location and availability of adequate playing fields and necessary equipment are necessary for talent development. Co-curricular infrastructure should be well located and well-structured for nurturing talents in students (Khaemba, 2007).

According to Stephens and Schaben (2014) modern approaches of education emphasize on all round development of the students. It is believed that unless balancing both the curricular and co-curricular activities is done, the very purpose of education would be left unrealized. Broh (2012) indicates that when extracurricular activities are well organized and supported by the school management, they promote academic performance in students.

Strong (2005) states that participation in co-curricular activities can help learners to improve their concentration, memory and classroom behaviour and that given competent providers, physical education can be added to the school curriculum by taking time from other subjects without the risk of hindering pupils' academic performance. On the other hand, adding time to academic or curricular subjects by taking time from physical education programmes does not enhance grades in these subjects and may be detrimental to health. Trudeau and Shephard (2015) have demonstrated that quality physical education produces important physical education benefits like increased activity and fitness while having no ill effect on academic learning. In a recent large- scale study looking at the relationship between physical fitness and academic

achievement, i.e. performance on standardized academic tests conducted in California found that, higher achievement on standardized tests was associated with higher levels of physical fitness.

The contribution of sports to the educational process in educational institutions cannot be overstated. Many researchers like Matano (1992) and Newman (2005), among others, have shown that participation in sports and other sport-related activities have a positive correlation with academic performance among students. A number of benefits can be reaped from participation in sports. Seaton et al. (1965), Durojaie (1976), and John and Campbell (2011) note that participation in sports, which enhances physical fitness, contributes to good health. Individuals who actively participate in sports exhibit increased vigour and alertness than those who do not (Weinberg and Gould, 2012).

According to Ekperigin and Uti (2016), participation in co-curricular activities leads to good body physique or posture, that is, balanced development of the whole body, the strength and fitness of all muscles. Sports being a physical activity help students to cooperate and work with others under the same rules and regulations towards a common goal. While commenting on re-introduction of sports in Afghanistan, Arnoldy (2005) observes that sports can be used as a vehicle for creating a safe space, and an entrance into the public sphere.

In emphasizing the role of sports, Seaton et al. (1965) and Helms and Turner (1992) indicate that muscular effort is seen as one of the best antidotes for emotional stress. Exercise is associated with reduced state of anxiety, depression, reduced stress indices and beneficial emotional effects across all ages and both sexes (Hinzen, 2014). Sigmund Freud believes that play serves to resolve, channel or rid the child of inner conflicts and anxieties (Mohan, 1992). Rhodes and Tracy (1974) state that play provides acceptable channels for cathartic release as well as serving as a means of both externalizing the child's conflicts and communicating his feelings about them to others. Erik Erickson, a psychologist, notes that play is one of the major functions of the ego and its development; therefore through play the child is able to advance to new developmental stages and to deal with life experiences, which the child attempts to repeat to master or to negate. In play the child makes up for frustrations and defeats in the real world (Faw & Belkin, 2016). Sports are also meant for enjoyment or for fun. Sigmund Freud believed that children are motivated by a pleasure principle, that is, they tend to seek pleasurable rather than painful experiences (Mohan, 1992). In the Kenya primary schools

education syllabus, it is spelt out that all teachers should be cognizant of the golden rule of sports, that of satisfaction from participation (Republic of Kenya, 2014).

Johann Heinrich Pestalozzi, an educationist, believes that the aim of the physical process of education is essentially moral – to develop perseverance, courage and self-control while Quintillian, the celebrated Greek orator and rhetorician of the first century, notes that play reveals children's bent and moral character (Rusk & Scotland, 1979). Clarke (1977) contended that sports should gradually lead to a sense of order and self-control. In Kenya, sports and recreation activities are seen as good ways of spending leisure time in a socially acceptable way and as a method of reducing time spent in imbibing intoxicants or engaging in crime and other anti-social activities (Republic of Kenya, 1998). Thus, play improves discipline among students by making them conscious of the meaning and value of rules, order and structure (Helms and Turner, 1976).

According to Weinberg and Gould (2015) athletes have better personality than non-athletes. In their research, they found out that those who play team sports as compared to non-athletes exhibit less abstract reasoning, more extroversion, more dependency and less ego strength; while those who play individual sports as compared to non-athletes display higher levels of objectivity, more dependency, less anxiety and less abstract reasoning. Still, other researchers have noted that athletes are more independent, more objective, and less anxious than non-athletes (Cox, 1998).

Play acts as pre-exercise for skills to be used later in life. According to Pre-Exercise Theory of Play, play serves to develop the mind and body for later life (Helms and Turner, 1992). They observed that through play children practice language, thereby developing it. This is in consonance with Krogh's (2014) assertion that play is the background from which good verbal development comes and which is associated with the richness of the environment. Loefflet et al. (2008) observes that girls who engaged in ice hockey were most likely to be retained in the education system and thus avoid dropout. He also noted that students who participated in high-level ice hockey performance got financial aid in form of scholarships at the higher secondary and post-secondary levels. Arnold (1968) posits that sports promote good health and that there is a positive relationship between average health, adjustment and exceptional academic achievement on one hand and on the other hand a relationship between low organic fitness and low scholastic achievement even when potential ability was above average.

In the Ugandan curriculum, sports are included formally through a subject called Physical Education and allocated one period of forty minutes in the lower secondary section and two periods in the upper secondary section. Less formally, every school is expected to have a games department and a games teacher. Various stakeholders in schools use two different ways of looking at sports (Bitamazire, 2011). The first position emphasizes that schools exist primarily for the pursuit of academic excellence and should focus on the transmission of formal education. For this reason, though sports are fun, they are not an important aspect of education. The other perspective suggests that experience gained through sports in terms of personal development is a vital part of the educational process. Therefore, the former believe that students' participation in sports interfere with academic programmes in schools while the latter maintain that it is important as part of school curriculum. A study done in Maryland, USA at Patapsco High School and Centre for the Arts showed that students who participated in sports performed better in academic work than their non-athlete counterparts (Weinberg & Gould, 2015). This was attributed to high level of discipline, hard work ethic and good health among student-athletes. The study also revealed that the centre was well equipped with sports facilities that increased access to sports activities, a factor that is seriously lacking in many secondary schools in Uganda.

### **2.2.3. Health and sanitation infrastructure and Students' Academic Performance**

Sanitation facilities should include solid waste disposal, drainage and adequate water for personal hygiene and to clean toilets. According to Gogo (2014), materials used in construction of school buildings and type of buildings determine the levels of cleanliness. A safe school must have sanitation facilities built up to the required standards and kept clean with high standards of hygiene. In order to enhance safety, the following must be observed: In cases where pit toilets are used, these structures should be built at least 10 metres away from tuition and boarding facilities and on the downwind side. Where an ablution block is attached to the dormitory, a high degree of cleanliness must be maintained. Pit latrines should not be less than 6 meters (20ft) deep, and should be regularly well disinfected. Pit latrines should be at least 15 meters (50 ft) away from a borehole or well or water supply point. Where there are boreholes or shallow wells in places with difficult soil types or land forms, the school management should seek the advice of the water department before the digging of a pit latrine. In mixed schools, girls' sanitation

areas must be separate and offer complete privacy. Each school should ensure safe and effective disposal of sanitary wear (Ministry of Education, 2008).

School sanitation is very significant in the life of a student; as Ddungu (2000) notes, general cleanliness is the foremost requirement for improved sanitation. The floor should be clean, windows washed and walls maintained clean. Attention should be given to general drainage system, water supply and toilet facilities. World Bank (2005) reports that in most developing countries, the sanitary conditions are often appalling, characterized by the absence of proper functioning water supply, sanitation and hand washing facilities. A report by the United Nations

International Children's Education Fund (UNICEF) (2006) showed that around 5.4 million youths worldwide do not have access to safe drinking water and use mainly unprotected surface water from rivers, ponds or dams. Findings further revealed that over two million youth did not have access to any kind of toilet facility. This lack of safe water, poor hygiene practices and lack of sanitation services were reported to be major causes of morbidity among children. Inadequate access to safe water and sanitation services, coupled with poor hygiene practices kills and sickens thousands of people every day and leads to impoverishment and diminished opportunities for thousands more. When it comes to schools, the World Bank (2005) warns that schools that lack access to basic water supply and sanitation services will have an increased incidence of major illness among students. Poor health is an important underlying factor for low school enrolment, absenteeism, poor classroom performance and early school dropout.

The State of Environmental Report (2014) concurs with the above as it reports that sanitation related diseases like malaria, diarrhoea, worm infection, eye infection and skin diseases account for roughly a half of the entire outpatient visits in the country and the major cause of mortality and morbidity. Medical centres can clearly affirm this since these centres keep on receiving sick students. The common disease treated is malaria since stagnant water which is a breeding ground for mosquitoes is part of the school compound and this is all because of poor sanitation. The Directorate of Education Standards (DES) Report of 2008 indicated that pit latrines in Nakasongola, Mubende, Mpigi and Mityana were inadequate, had no washing facilities, had poor drainage system and lacked safe water for drinking. In Mpigi specifically, the study found out that sanitation in schools was very poor. There was no evidence of regular cleaning and schools did not have cleaning materials; most of the urinals were blocked and learners were forced to use outside the urinals such that pools of stagnant

urine were common sights in most schools. It was however not clear whether the same situation prevailed in Kajara County. This prompted the researcher to investigate whether the findings of DES (2008) were specific to only the districts surveyed or similar findings could be established in Ntungamo District, and specifically in secondary schools of Kajara County.

Once sanitation is substandard, occupants are likely to spend more time in health facilities. This therefore makes the environment unsafe places where diseases are transmitted with mutually reinforcing negative impacts for the dwellers, in this context students, families and schools development. In this regard, Ddungu's (2000) study conducted in Rakai pointed out that poor sanitary conditions in which people become accustomed to poor hygiene are dangerous to the psychological upbringing and to the learning process of children.

Njoku's (2014) study that aimed at investigating the Conditions affecting quality living and successful learning revealed that a clean environment allows student time to concentrate on reading books usually in silent environment. These revelations were later confirmed by UNICEF (2006) which reiterated that good sanitation and hygienic standards have an influence on growth and development of the child, school attendance and the rate of school dropouts. Whether the situation was the same with secondary schools of Kajara County was the concern of this study.

All children need a sanitary and hygienic learning environment but the lack of sanitation and hygiene facilities in schools has a stronger negative impact on girls than boys. Girls need safe, clean, separate and private sanitation facilities in their schools. According to a study by the Government of Bangladesh and UNICEF, it was revealed that there was 11% increase in girls' enrolment mainly due to the provision of sanitary latrines (Redhouse, 2004), as quoted in IRC (2007). A similar study in Kenya found out that provision of safe toilets reduced girls' absenteeism by 39% (UNICEF, 2010). The studies looked at how provision of sanitation increased enrolment and reduced absenteeism respectively; however it is also known that enrolment is important to increase access to education and that reduced absenteeism is important in helping the pupils to complete the syllabus and hence perform better. This study therefore

extended from where these left to find out if the reduction in absenteeism was useful in contributing to better mean grades for these schools.

A recent study on violence in and around schools in Swaziland and Zimbabwe revealed that girls considered their toilets as unsafe places, the unsafe toilets were seen to be cut off, isolated where as in contrast, the latrine outside the headmasters office was considered safe (Mitchell & Mothopi-Tapela , 2004) as quoted in IRC (2007). These findings have brought an interesting perspective in the provision of sanitation facilities in schools, i.e. the facilities should be located in safe, secure and child-friendly environment as this is important so that the pupils are feeling safe and psychologically at peace enough to concentrate in their studies. This may contribute to reduced absenteeism and thus better performance.

Esrey (2014), in his analysis of 144 water and sanitation studies which show the importance of improved hygiene and safe excreta disposal as interventions to reduce diarrhoea, found out that safe excreta disposal contributed to the highest i.e. 36% of reduction in diarrhoea among other variables. The reduction then was expected to also reduce absenteeism due to illness and eventually improve performance.

A study in Mali (Shordt, 2004) West Africa demonstrated that academic performance is related to the level of schistosomiasis (a worm caused by poor sanitation) infection as measured by the number of eggs per 10ml urine. The findings of the study seem to answer the research questions of this proposed study. However, it is important to note that the sample was only 580 children in two primary schools in the whole country.

In Uganda, the school population has continued to grow since 2003 and there has been no corresponding expansion of physical facilities. According to a survey by the Ministry of Water and Environment in 2003, as quoted in Karyebara (2005) on the sanitation situation in schools, the majority of schools were categorized as dangerous with rural areas being hardest hit with an average of 414 pupils /latrine in the worst schools. However, rural areas have continued to perform better in national examinations compared to others whose sanitation situations were better, yet the literature supports the relationship between sanitation and performance. It is therefore important to have more studies to segregate the schools as rural, urban, private or public so as to inform proper policy review and resource allocation to school water sanitation and hygiene.

### **2.3. Research gap**

The reviewed literature shows the effort of several scholars who studied the influence of school infrastructure on students' academic performance, specifically sanitation facilities, learning facilities and co-curricular facilities. Through the reviewed literature, the researchers found out that a school is a system whose academic achievement depends on several factors which involve funding, economic factors, geographical, curriculum, instructions, social-culture of the area etc. Therefore, dealing with school issues requires a state of care due to its complexity.

The literature has also provided an in-depth knowledge about the nature and the genesis of the influence of school infrastructure on students' academic performance. First, by providing a general (global) overview; second, by drawing experience on case studies which mostly come from the developing countries and which provide a wide focus on the respective situations of Africa, especially Uganda, and finally merging into the situation in Ntungamo District.

A number of gaps were identified as per the reviewed literature, some of which this study sought to bridge. Most of the studies on the subject were based in developed countries with a well- developed infrastructure in education, while the current study was based in Uganda. Most studies focused on the influence of school infrastructure on academic achievement with a general overview on the facility management and performance of the buildings and do not guide us on the relationship between the study variables at hand. Femi (2014) tried to observe few factors influencing students' academic performance but recommended further research to be done. Based on these, therefore, the current study focused on the influence of school infrastructure on students' academic performance in Kajara county, Ntungamo District.

Asiyai (2012) investigated school facilities in public secondary schools in Delta State, Nigeria. The purpose of the study was to find out the state of the facilities, the types of maintenance carried out on the facilities by school administrators, the factors causing the school facilities' depreciation and the roles of school administrators in the management and maintenance of school facilities. However, the study did not become specific on how the respective key elements of school infrastructure affect learners' outcomes. This study established the influence of school infrastructure and students' performance in Kajara county, Ntungamo District.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.0. Introduction**

The chapter presents the research design, study population, sampling size and sample selection, data collection methods and instruments, validity and reliability, research procedure, data analysis, limitations of the study and ethical considerations.

#### **3.1 Research Design**

Research design is the plan and the procedures for research that entails the broad assumptions and detailed methods of data collection and analysis (Mugenda & Mugenda, 1999). It is the blueprint for collection, measurement and analysis of data. It entails the methods of data collection, analysis and interpretations that translate the approach into practice (Kothari & Gaurav, 2014). The researcher used a cross-sectional survey design with both qualitative and quantitative approaches because the study intended to pick only some representative sample elements of the cross-section of the population. The cross-sectional survey research design was used because the method gathers data from a relatively large number of different categories of respondents at a particular time. According to Mugenda and Mugenda (1999) this design is used when the study is aimed at collecting data from the respondents without the need to make a follow up of the same respondents; thus it saves time to collect the necessary information when the design is used. A cross-sectional survey design collects data to make inferences about a population of interest at one point in time. The advantage of a cross-sectional survey is its flexibility in that it can be conducted using any mode of data collection.

#### **3.2. Study population**

The study population consisted of head teachers, teachers, health workers and students from candidate classes. A total of 240 target population was used with 6 head teachers, 6 health officers, 198 students and 30 teachers. The above were believed to be informed about the variables under study.

#### **3.3. Sample Size**

A total sample size of 148 out of 240 target population were selected or drawn from all categories of respondents. This population acted as a sample and provided relevant information

for the study. The sample size was determined with the help of the formula forwarded by Yamane (1967) as

$$n = \frac{N}{1 + N(e)^2}$$

Where;

N : Number of target population that conforms to the characteristics of the sample required, e: Margin of error (5%).

n: sample size

Given the population of 240

respondents,  $n = \frac{240}{1 + 240 \times (0.05)^2}$

$n = 148$

Respondents for each category was computed based on their weight, according to Neyman (1934) allocation formula as follows;

$$n_h = \frac{N_h}{N} n$$

Where:

$n_h$  - The sample size for stratum h,

n - Total sample size,

$N_h$  -The population size for stratum h,

N- The total population

Respondents category	Target population	Sample size
Head teachers	6	6
health officers	6	6
Students	198	118
Teachers	30	18
<b>Total</b>	<b>240</b>	<b>148</b>

Source: Field Study by the Researcher, 2019

### 3.4. Sampling technique

Purposive sampling and stratified sampling techniques were employed.

### **3.4.1 Purposive sampling**

Purposive sampling technique was employed because it facilitates the collection of data from specific types of people who are able to provide the desired information. Purposive sampling involved identifying and selecting individuals or groups of individuals that were knowledgeable about or experienced with a phenomenon of interest (Creswell and Plano, 2011). Teddlie and Fen Yu (2007) affirm that purposive sampling is typically designed to pick a small number of cases that yielded the most information about a particular phenomenon. This technique was employed to select the head teachers and health officers. These categories of respondents provided the desired information.

### **3.4.2. Stratified sampling**

Hair (2007) states that this type of sampling technique is the most recommended technique as it considers the geographical diversity of a population. Kumar (2008) adds that this technique improves the representativeness of the sample by reducing sampling error and that this sampling method becomes cheaper as the researcher only concentrates on differences within the stratum hence saves on costs and is quick and easy. Stratified sampling required classification of the population into smaller groups (strata) with similar characteristics, and from each stratum samples are selected randomly (Kombo and Tromp, 2010). When the samples randomly selected from each stratum are proportional to the total number of samples in the entire stratum, the sampling technique is called proportionate random sampling (Kothari, 2004). In stratified sampling, all characteristics present in the population are reflected in the samples selected since the basis of stratification is to have sub-groups whose samples are of similar characteristics (Orodho, 2003). This sampling technique is advantageous because the researcher makes sure that there is no bias in the sample selected.

## **3.5. Data Collection Methods**

The study used both questionnaire survey and interview as methods in data collection.

### **3.5.1 Interview**

According to Ranjit Kumar (2011), interview is when an interviewer reads question to respondents and records their answers. It also involves verbal interchange, often face to face,

though the telephone may be used in which an interviewer tries to elicit the information, benefits, opinions from another person. Interviews gave an opportunity to the researcher to revisit some of the issues that had been overlooked in other instruments and yet they were deemed vital for the study. The interviews captured questions on the independent and dependent variables and in the course interviewing probing was applied so as to elicit a good response rate. An interview with each respondent lasted for only ten minutes or less. This method involved developing questions on a piece of paper to guide the entire exercise. The researcher used this method to obtain firsthand information from respondents in detail since the researcher had a chance to probe the respondents in addition to asking predetermined questions. Key informant interviews enabled the researcher to obtain quality data in a relatively short period of time from knowledgeable people. It also enabled one to obtain the same views which could be prohibitively time-consuming and expensive amount of information and insight from in-depth (Family Practice, 1996). All the important information was captured, as the respondents had all the time to express their views verbally as the researcher was recording. In relation to the above, this method was used to get information from head teachers and health officers.

### **3.5.2. Questionnaire survey**

Kothari (2004) defines questionnaire as a set of questions sent to a person concerned with a request to provide answers and return the questionnaire. This is an appropriate and cost-effective method that is free from the interviewer's bias (Babbie, 2011). According to Sekaran (2003), questionnaire is a popular method of collecting data because researchers can gather information fairly easily and responses are easily coded. The structured questionnaire was developed following recommended guidelines by various scholars that include Kothari (2005); Sekaran and Bougie (2010) and Saunders et al. (2009). Questionnaires were preferred because they were convenient as respondents filled them during their free time and had a chance to consult for views and information. Self-administered questionnaires with closed-ended questions were used to collect data from teachers and students. This helped the researcher to save time for other academic matters. Surveys were useful in describing the characteristics of a large population. No other research method can provide this broad capability, which ensured a more accurate sample to gather targeted results from which to draw conclusions and make important decisions (Scheuren, Fritz, 2004). Surveys also required selecting populations for inclusion, pre-testing instruments, determining delivery methods, ensuring validity and analysing results.

### **3.6. Data Collection instruments**

#### **3.6.1. Interview guide**

The instrument had pre-designed questions about the issues to be discussed as a guide to the interview and to ensure that all relevant aspects were covered. The instrument intended to tap extra and detailed information on opinions, beliefs and perceptions on the topic. Interviews allowed the researcher to clarify items on the study by repeating and rephrasing questions that seemed not clear to respondents (Kothari, 2004). Interviews were held with head teachers. The interview guide also helped to get some answers to unanswered issues in the questionnaire.

#### **3.6.2. Structured questionnaires**

The researcher constructed a questionnaire that had closed ended questions, which were designed to obtain information and data from the teachers and students. Structured questionnaires were preferred by the researcher because of its advantages like: easy to administer on a large population which is largely literate; teachers and students who were the main respondents are literate. Questionnaires require less time and money compared to other methods like focus group discussions (Moser and Kalton, 1979). However, because questionnaires did not allow probing, prompting and clarification (Amin, 2005), the researcher employed interview in order to collect additional data that might have been left out by the questionnaires whose items were fixed.

### **3.7. Data quality control**

#### **3.7.1. Validity**

In scientific research, validity refers to the extent to which the instruments are relevant in measuring what they are supposed to measure (Amin. 2005). The researcher requested her two supervisors to score the content with the questionnaire: and the average percentage of the score was used to determine the Content Validity Index (CVI). The average percentage was above 50%, hence the content was considered to be valid. The formula below was used to check for validity of the research questions.

$$\text{CVI} = \frac{\text{No. of Questions (Items) declared Valid}}{\text{Total No. of Questions (Items)}}$$

According to Sarantakos (2016), validity is the property of a research instrument that measures its relevance, precision and accuracy. Validity tells the researcher whether an instrument measures what it is supposed to measure and whether this measurement is accurate and precise.

It measures the quality of the process of measurement, and one that reflects the essential value of a study, and which is accepted, respected and indeed expected by the researchers and users of research. A pilot test was used as an important part of the study done before asking the respondents to fill out the questionnaires. This is because it assures validity of the study instruments. Wiersma (1985) noted that piloting is important because it helps to identify misunderstandings, items that are not clear and unusable or insufficient items. It also ensures that the questions have clear words and that the respondents understand the questions properly (Dahlberg & McCaig 2010). To carry out the pilot test, the researcher issued questionnaires to 10 students who were excluded from the study about two weeks before the study. From the answers given, the researcher was able to gauge the effectiveness of the questionnaires in collecting the required data, detect the mistakes and improve on the questionnaire. Some of the items detected included questions that were not clear or were misunderstood and improvements were made on them. There were also questions that seemed hard for students at some levels of education to understand and thus the questions were made simple as much as possible. This was done in order to refine the questionnaire before being subjected to the real study.

### **3.7.2. Reliability**

Mugenda and Mugenda (2003) define reliability as a measure of the degree to which a research instrument yields consistent results or data after repeated trial. The pilot study enabled the researcher to assess the clarity of the questionnaire items so that those items found to be inadequate or vague were modified to improve the quality of the research instrument thus increasing its reliability. The reliability of data was confirmed by the approval of data collection methods and tools by the university through the research supervisor, pre-testing the tools and careful choice of relevant questions and words were used in the study. In this study, reliability of the instrument was improved through having a pilot study where the questionnaire was given to 10 learners who were not included in the study. From their response, the researcher was able to identify questions that were not clear or were misunderstood and made improvements on them. There were also questions that seemed hard for students at some levels of education to understand and thus the questions were made simple as much as possible. It was done in order to refine the questionnaire was refined before being subjected to the real study. The following

mathematical formula for Cronbach's alpha was used to measure the reliability and internal consistency.

$$\alpha = \frac{K\bar{c}}{(\bar{v} + (K - 1)\bar{c})}$$

Where:

$K$  is the number of test items

$\bar{v}$  Is the average variance, and

$\bar{c}$  is the average of all covariance between the components across the current sample.

### **3.8. Research Procedure**

To obtain primary data the researcher got an introductory letter from the graduate school of Kabale University to introduce him to the management of Ntungamo District Education Department where the study took place. The introductory letter was used to seek permission for the researcher to carry out research in the area.

### **3.9. Data analysis**

Both quantitative and qualitative data was analysed as follows.

#### **3.9.1. Quantitative Data Analysis**

Data from the field was coded and entered into Statistical Package for Social Sciences (SPSS) version 22 for analysis. This software had the capacity to quantitative analyse complex data collected through various means. The study used both descriptive and inferential statistics to analyse data from SPSS. Frequencies, mean and standard deviation were used for descriptive statistics while Pearson Product Moment Correlation Coefficient and regression analysis were done for inferential statistics. The study used a low significance level of 0.05 in order to control Type I and Type II errors. All the data analysis of the study was reported in form of tables.

#### **3.9.2. Qualitative analysis**

The data collected using qualitative methods, was perused, edited for consistency and to test completeness aimed at correctness of the data collected. The researcher used inductive content analysis. Qualitative data collected was received, reviewed thoroughly and interviews transcribed. These were sorted and classified into themes and categories using ATLAS ti.7 computersoftware. The data collected through interviews was analyzed and presented in form

of statements like paraphrasing and quotations. Through such process, patterns, trends and relationships from coded information were established.

### **3.10. Ethical Considerations**

There are several reasons why it is important to adhere to ethical norms in research. First, norms promote the aims of research, such as knowledge, truth, and avoidance of error. For example, prohibitions against fabricating, falsifying, or misrepresenting research data promote the truth and avoid error. Second, since research often involves a great deal of cooperation and coordination among many different people in different disciplines and institutions, ethical standards promote values that are essential to collaborative work, such as trust, accountability, mutual respect, and fairness (Amin, 2005). To avoid plagiarism, the work was subjected to the anti-plagiarism test using the anti-plagiarism software called Turn It In of different authors were acknowledged whenever they were cited.

Various ethical rules were respected during the research process. First, the researcher got a letter of introduction from Graduate School of Kabale University which was submitted to the District education officer Ntungamo District in order to get the permission of collecting data and the acceptance letter was provided. The respondents were protected by keeping the information given confidential and where there was a need to reveal, the researcher promised respondents that she would first get their consent. With regard to individual freedom, no respondents were forced to participate in the study and they were free to withdraw from the study anytime they wished. The respondents were assured that the data to be collected was for academic purpose only. The questionnaires did not include the names of the respondents for issues of privacy and secrecy. Throughout the research process plagiarism was avoided by quoting and referencing.

### **3.11. Limitations of the study**

The study encountered the following constraints:

The time available for this research was not enough to allow exhaustive study and obtain all the essential information for much more suitable conclusions. The problem was minimized by putting much effort on this research so as to meet the deadline.

Slow or non- response: Since the researcher did not know the kind of respondents to deal with, some of them might have failed to respond or delay to do so. The researcher made convenient appointments with the respondents and encouraged them to respond and give true information in time.

Bureaucracy could delay the study: From all the procedures, getting data from management took a lot of time. However, the researcher talked and appealed to the bureaucrats for data.

Financial constraints: The research required substantial amount of money for travelling, printing questionnaires, among others. To solve this problem, the researcher solicited funds from family members and friends and also looked for cheaper service providers.

## CHAPTER FOUR

### ANALYSIS, PRESENTATION AND INTERPRETATION OF FINDINGS

#### 4.0. Introduction

This chapter presents findings in regard to school infrastructure utilization and students' academic performance in secondary schools of Kajara County, Ntungamo District. The first section of this chapter presents findings on physical infrastructure on students' academic performance in Kajara County, Ntungamo District. The second section presents findings on co-curricular infrastructure and students' academic performance. The third section presents findings on health and sanitation facilities and students' academic performance. Finally, the findings are presented on indicators of students' academic performance. Both descriptive and inferential statistics were utilized in presenting the findings of the study on frequency distribution tables.

#### 4.1. Background information

The demographic characteristics of the study were analysed and presented in chapter four. Such background information was collected on the gender of the respondents, teaching experience, student level of study, qualifications of teachers. This background information had a strong bearing on the study results. Table 4.1 presents the background information.

**Table 4.1 Background Characteristics**

SN	Item	Freq.	%
<b>1.</b>	<b>Gender of Respondents</b>		
	Male	94	63.5%
	Female	54	36.5%
	<b>Sub-total</b>	<b>148</b>	<b>100.0%</b>
<b>2.</b>	<b>Teaching Experience</b>		
	1-5 years	33	22.3
	6-10 years	50	33.7
	11-15 years	40	28.0
	Above 16 years	25	16.9
	<b>Sub-Total</b>	<b>148</b>	<b>100.0%</b>

<b>3.</b>	<b>Level of Study</b>		
	Ordinary Level	78	52.3
	Advanced Level	70	47.3
	<b>Sub-Total</b>	<b>148</b>	<b>100.0%</b>
<b>4.</b>	<b>Teacher Qualifications</b>		
	Diploma	73	49.3
	Bachelor's Degree	61	41.2
	Masters	14	9.5
	<b>Sub-Total</b>	<b>148</b>	<b>100.0%</b>

Source: Field Data

Generally, demographic characteristics influence the study findings greatly especially in survey studies such as this one. As such, the results on respondents' demographics (as indicated in Table 4.1) indicate that Male respondents were the majority (63.5%) compared to their female counterparts (36.5%). This means that male respondents influenced the study findings the most because they were the majority. As far as teaching experience was concerned, most teachers 50 (33.7%) had experience ranging between 6 and 10 years, followed by those 40(28%) with experience between 11 and 20 years. This implies that most teacher respondents had between 6 and 16 years' teaching experience. Most secondary schools employ and retain teachers in this age bracket because teachers in this age group are the most dynamic, creative and experienced. Teachers above 16 years' teaching experience are old and have seen it all; at this time people begin to think of their retirement.

Concerning the level of study of the student respondents, most of the respondents 78 (52.3%) were in ordinary level while 70 (47.3%) were in advanced level of study. Then regarding teacher qualifications of the respondents, most of them 73(49.3%) held diplomas, 61 (41.2%) had Bachelor's degrees, and few 14 (9.5%) possessed Master's degrees.

#### **4.2. Physical infrastructure and students' academic performance in Kajara County, Ntungamo District**

Results under this theme were sought in accordance with research objective one of this study which sought to examine the relationship between physical infrastructure and students'

performance in Kajara County, Ntungamo District. Participants were presented with the statements on the five-point Likert scale (strongly agree (SA), agree (A), Not sure (NS), disagree (D) and strongly disagree (SD). Their responses were presented and analysed using a frequency distribution table with percentages. For simplicity of analysis, in this study “strongly agree” and “agree” were aggregated to mean “agree” and “strongly disagree” and “disagree” were aggregated to mean “disagree”. To make the analysis more explicit, the mean for items was computed to aid the analysis. In this study, a mean of 5.0 means that all participants agreed with the statements put to them and a mean of 1.0 means that all the participants disagreed with the statement put to them; a mean of above 3.0 indicates that the majority of the participants were in agreement on the statements put to them; a mean of below 3.0 indicates the majority of the participants were in disagreement; and a mean of 3.0 indicates that the participants were neutral. The elicited results are presented in Table 4.1.

**Table 4.2: Physical infrastructure and students’ academic performance in Kajara County, Ntungamo District**

<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>	<b>Std.</b>
The library is equipped with up to date and relevant textbooks	35 (25.7%)	18 (13.2%)	6 (4.4%)	28 (20.6%)	49 (36%)	3.81	.732
Teaching aids, maps & Charts are adequate in the school	0 (0.0%)	7 (5.1%)	6 (4.4%)	82 (60.3%)	41 (30.1%)	4.00	.808
Laboratory chemicals and apparatus are enough in the school	0 (0.0%)	6 (4.4%)	20 (14.7%)	75 (55.1%)	35 (25.7%)	4.14	.645
Laboratories are utilized for optional subjects because of inadequate Classrooms	7 (5.1%)	27 (19.9%)	14 (10.3%)	68 (50%)	20 (14.7%)	3.59	.541
Classrooms have adequate Ventilations	7 (5.1%)	13 (9.6%)	7 (5.1%)	27 (19.9%)	82 (60.3%)	3.90	.757
The number of students’ desks, teacher’s chairs and tables in the room are adequate	14 (10.3%)	20 (14.7%)	0 (0.0%)	67 (49.3%)	35 (25.7%)	3.94	.761
The school has enough space for wide range of teaching and learning Approaches	7 (5.1%)	13 (9.6%)	0 (0.0%)	54 (39.7%)	62 (45.6%)	3.94	.745

**Source: Primary data, 2019**

Table 4.1 shows that majority of respondents agreed with the statements rated on the questionnaire. This is explained by their mean which is above 3, and their standard deviations which is close to 1. The respondents’ responses were as follows;

Table 4.2 indicates that the majority of the respondents (56.6%) agreed that their library was equipped with up to date and relevant textbooks (Mean= 3.81; Standard deviation= 0.732). Another group of respondents (90.4%) agreed that teaching aids, maps and charts were adequate in the school (Mean= 4.00; Standard deviation= 0.808). Also, 80.8% agreed that laboratory chemicals and apparatus were enough in the school (Mean= 4.14; standard deviation= 0.645). In addition, 64.7% of the participants agreed that laboratories were utilized for optional subjects because of inadequate classrooms (Mean= 3.59; Standard deviation= 0.757). Regarding classrooms, 80.2% agreed that classrooms had adequate ventilation. Also, 75% agreed that the number of students' desks, teacher's chairs and tables in the room were adequate (Mean= 3.94; Standard deviation= 0.761). Finally, 85.3% agreed that the school had enough space for a wide range of teaching and learning approaches. These findings show that secondary schools in Kajara County, Ntungamo District, to a larger extent, had physical infrastructure in place as portrayed by the results stated herein. What is the implication of this finding? These findings were supplemented by findings from the interviews in which the participant was quoted saying:

*“.....having adequate learning facilities like well stocked library, laboratory (both science and ICT), enough furniture and classrooms is no doubt an added advantage towards excellent academic performance because it means literally that don't lack anything.....”* (MHSK DH 03)

#### **4.2.1. The relationship between physical infrastructure and students' performance in Kajara county, Ntungamo District**

**Table 4.3: Pearson correlation coefficient for physical infrastructure and students' academic performance**

		Physical infrastructure	Students' academic performance
Physical infrastructure	Pearson Correlation	1	.003
	Sig. (2-tailed)		.675**
	N	136	136
Students' academic	Pearson	.003	1

Performance	Correlation		
	Sig. (2-tailed)	.675**	
	N	136	136
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 4.3 indicates that there is a strong positive correlation between physical infrastructure and students' academic performance ( $r = .792^{**}$ ;  $p < .003$ ). This is an indication that physical infrastructure strongly influences students' academic performance. This practically implies that when the schools have adequate infrastructure in place, there is a high possibility that students will excel academically. This is an indication that any positive change in physical infrastructure leads to students' academic performance by 67.5%.

#### **4.2.2. Co-curricular infrastructure and students' performance in Kajara county, Ntungamo District**

Results under this theme were sought in accordance with research objective one of this study which sought to examine the relationship between co-curricular infrastructure and students' performance in Kajara county, Ntungamo District. Participants were presented with the statements on the five-point Likert scale (strongly agree (SA), agree (A), Not sure (NS), disagree (D) and strongly disagree (SD)) were presented and analysed using a frequency distribution table with percentages. For simplicity of analysis, in this study "strongly agree" and "agree" were aggregated to mean "agree" and "strongly disagree" and "disagree" were aggregated to mean "disagree". To make the analysis more explicit, the mean for items was computed to aid the analysis. In this study, a mean of 5.0 means that all participants agreed with the statements put to them and a mean of 1.0 means that all the participants disagreed with the statement put to them; a mean of above 3.0 indicates that the majority of the participants were in agreement on the statements put to them; a mean of below 3.0 indicates the majority of the participants were in disagreement; and a mean of 3.0 indicates that the participants were neutral. The elicited results are presented in Table 4.4.

**Table 4.4: Co-curricular infrastructure and students' performance in Kajara County, Ntungamo District**

Statement	SD	D	NS	A	SA	Mean	Std.
Students are allowed to participate in	13	14	13	47	49		

co-curricular activities of their choice	(9.6%)	(10.3%)	(9.6%)	(34.6%)	(36%)	3.31	.703
The school has enough sports equipment (ball, musical instruments etc)	7 (5.1%)	33 (24.3%)	7 (5.1%)	35 (25.7%)	54 (39.7%)	3.73	.583
Participation in co-curricular activities helps learners to relax and refresh the brain	7 (5.1%)	7 (5.1%)	12 (8.8%)	61 (44.9%)	49 (36%)	3.85	.683
Participation in co-curricular activities helps learners to reduce boredom due to overstaying in long classes	7 (5.1%)	12 (8.8%)	6 (4.4%)	69 (50.7%)	42 (30.9%)	3.87	.774
Participation in co-curricular activities play a role in the health of learners	0 (0.0%)	0 (0.0%)	0 (0.0%)	87 (64%)	49 (36%)	3.66	.845
Participation in co-curricular activities enhances the attention and concentration levels of the learners	7 (5.1%)	7 (5.1%)	14 (10.3%)	80 (58.8%)	28 (20.6%)	3.80	.891
Co-curricular activities help learners to make friends	6 (4.4%)	13 (9.6%)	14 (10.3%)	61 (44.9%)	42 (30.9%)	3.72	.678

**Source: Primary data, 2019**

Table 4.4 indicates that the majority of the respondents (70.6%) agreed that students were allowed to participate in co-curricular activities of their choice (Mean= 3.31; Standard deviation= 0.703). Also, 65.4% agreed that their school had enough sports equipment (ball, musical instruments etc) (Mean= 3.73; Standard deviation= 0.583). In addition, 80.9% agreed that participation in co-curricular activities helped learners to relax and refresh the brain (Mean= 3.85; Standard deviation= 0.683). Also, (81.6%) agreed that participation in co-curricular activities helped learners to reduce boredom due to overstaying in long classes (Mean= 3.87; Standard deviation= 0.774). All respondents (100%) agreed that participation in co-curricular activities played a role in the health of learners (Mean= 3.66; Standard deviation= 0.85). Results further show that the majority of the respondents (79.4%) agreed that participation in co-curricular activities enhanced the attention and concentration levels of the learners (Mean= 3.80; Standard deviation= 0.891). Finally, (75.8%) agreed that co-curricular activities helped learners to make friends (Mean= 3.72; Standard deviation= 0.678). This implies that schools in Kajara County, Ntungamo District allow their students to participate in co-curricular activities which have a strong bearing on their academic performance.

These findings were supplemented by views from the interviews in which one of the participants had this to say:

*“.....in my opinion, co-curricular facilities are important in the learning process of the students. This is because, it very fundamental for students to engage in co- curricular activities routinely and they cannot do it without these facilities. As I speak, our students have gone for zonal competitions. These competitions are very important because they help students to develop cognitively and stimulate during learning process.....”* (RHS HM 001).

#### **4.2.3. The relationship between co-curricular infrastructure and students' performance in Kajara County, Ntungamo District**

**Table 4.5: Correlation coefficient co-curricular infrastructure and students' performance**

		Co-curricular infrastructure	Students' academic performance
Co-curricular infrastructure	Pearson Correlation	1	.000
	Sig. (2-tailed)		.381**
	N	136	136
Students' academic performance	Pearson Correlation	.000	1
	Sig. (2-tailed)	.381**	
	N	136	136
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 4.5 indicates that there is a weak but significant relationship between co-curricular infrastructure and students' academic performance ( $r = .381^{**}$ ,  $P < .000$ ). This implies that availability of co-curricular infrastructure in a school influences the academic performance of students in secondary. This implies that any positive change in co-curricular infrastructure in a secondary school leads to change in academic performance of secondary school students by 38.1%.

#### **4.3. Health and sanitation infrastructure and students' performance in Kajara county Ntungamo District**

Results under this theme were sought in accordance with research objective one of this study which sought to examine the relationship between health and sanitation infrastructure and students' performance in Kajara county, Ntungamo District. Participants were presented with the statements on the five-point Likert scale {strongly agree (SA), agree (A), Not sure (NS), disagree (D) and strongly disagree (SD)} were presented and analysed using a frequency distribution table with percentages. For simplicity of analysis, in this study “strongly agree” and “agree” were aggregated to mean “agree” and “strongly disagree” and “disagree” were aggregated to mean “disagree”. To make the analysis more explicit, the mean for items was computed to aid the analysis. In this study, a mean of 5.0 means that all participants agreed with the statements put to them and a mean of 1.0 means that all the participants disagreed with the statement put to them; a mean of above 3.0 indicates that the majority of the participants were in agreement on the statements put to them; a mean of below 3.0 indicates the majority of the participants were in disagreement; and a mean of 3.0 indicates that the participants were neutral. The elicited results are presented in Table 4.6.

**Table 4.6: Health and sanitation infrastructure and students' performance in Kajara county, Ntungamo District**

Statement	SD	D	NS	A	SA	Mean	Std.
Classrooms are swept on a daily Basis	7 (5.1%)	0 (0.0%)	0 (0.0%)	32 (23.5%)	97 (71.3%)	4.00	.870
The school compound is always kept Clean	6 (4.4%)	7 (5.1%)	0 (0.0%)	54 (39.7%)	69 (50.7%)	4.58	.813
The school provides separate toilets blocks for boys and girls.	0 (0.0%)	7 (5.1%)	0 (0.0%)	40 (29.4%)	89 (65.4%)	4.01	.889
Bathrooms and toilets are always kept tidy	13 (9.6%)	7 (5.1%)	14 (10.3%)	62 (45.6%)	40 (29.4%)	4.06	.833
The school has got a well-stocked medical facility.	0 (0.0%)	14 (10.3%)	14 (10.3%)	81 (59.6%)	27 (19.9%)	3.73	.734
There are always anal cleansing materials in the latrines (toilet paper etc)	20 (14.7%)	28 (20.6%)	14 (10.3%)	53 (39%)	21 (15.4%)	3.81	.589
Sanitation facilities provide high level of hygiene	7 (5.1%)	0 (0.0%)	0 (0.0%)	33 (24.3%)	96 (70.6%)	4.56	.736

**Source: Primary data, 2019**

Table 4.6 shows that the majority of respondents agreed with the statements rated on the questionnaire. This is explained by their mean which is above 3, and their standard deviations which is close to 1. The respondents' responses were as follows:

Table 4.6 indicate that the majority of the respondents (94.9%) agreed that classrooms were swept on a daily basis (Mean= 4.00; Standard deviation= 0.870). Also, (90.4%) agreed that the school compound was always kept clean (Mean= 4.58; Standard deviation= 0.813). In addition, (94.9%) agreed that the school compound was always kept clean (Mean= 4.01; Standard deviation= 0.889). Another group of respondents (75.1%) agreed that bathrooms and toilets were always kept tidy (Mean= 4.06; Standard deviation= 0.833). It was also found out that (79.5%) agreed that the school had got a well-stocked medical facility (Mean= 3.73; Standard deviation= 0.734). The study further found out that (54.4%) agreed that there were always anal cleansing materials in the latrines (toilet paper etc) (Mean= 3.81; Standard deviation= 0.589). Finally, (94.9%) agreed that sanitation facilities provided high level of hygiene (Mean= 4.56; Standard deviation= 0.736). This implies that sanitation facilities were very significant in students' learning in secondary schools and there have a strong influence towards students' academic performance. These findings were supplemented by one of the participants in an interview who had this to say:

*".....yes! When sanitation and health facilities are in place, they make the school environment motivating for students and learn without any regret. For instance when latrines are clean, water is available and their dormitories are clean, students find no excuse but study and score highly. That is why we have ensured that everything in place in order not to disturb the teaching-learning process..."*  
(WESS SN 05).

In the same vein another participant also added that:

*"....we have more than in enough sanitation and health facilities because we are very much aware that these facilities have a strong influence on how students perform academically. When a student is healthy, this automatically translates into academic performance...."* (MHSK DH 003).

**Table 4.7: Correlation coefficient for sanitation facilities and students’ academic performance in secondary schools**

		Health and sanitation infrastructure	Students’ academic performance
Health and sanitation infrastructure	Pearson	1	.040
	Correlation		
	Sig. (2-tailed)		.642**
	N	136	136
Students’ academic performance	Pearson	.040	1
	Correlation		
	Sig. (2-tailed)	.642**	
	N	136	136
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 4.7 indicates that there is a strong positive correlation between sanitation infrastructure and students’ academic performance ( $r = .642^{**}$ ,  $P < .040$ ). This is an indication that availability of sanitation facilities influences students’ academic performance in secondary schools. This shows that any positive change in health and sanitation facilities in a secondary schools leads to a positive change in students’ academic performance by 64.2%.

#### **4.4. Indicators of students’ academic performance**

In an attempt to understand indicators of students’ academic performance, the respondents gave their opinions based on a five-point Likert scale of “strongly agree” (SA), “agree” (A), “undecided” (UD), “disagree” (D) and “strongly disagree” (SD). To ease the analysis, the percentages for “strongly agree” and “agree” were aggregated together to represent “agree” and the percentages for “strongly disagree” and “disagree” were also aggregated together to represent “disagree”. Data was analyzed using percentages and the mean. The elicited responses are presented in Table 4.8.

**Table 4.8: Students knowledge on how to use school infrastructure**

<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>	<b>Std.</b>
Students have computer knowledge	17 (12.5%)	11 (8.1%)	4 (2.9%)	96 (70.6%)	8 (5.9%)	3.81	.639
Students possess knowledge about the use of instructional materials	9 (6.6%)	8 (5.9%)	3 (2.2%)	116 (85.3%)	0 (0.0%)	4.06	.745
Performance standards in terms of grade scores in this school are high	8 (5.9%)	18 (13.2%)	6 (4.4%)	98 (72.1%)	6 (4.4%)	3.60	.617
Students level of self-awareness is high	11 (8.1%)	14 (10.3%)	4 (2.9%)	106 (77.9%)	1 (0.7%)	3.86	.813
Students perform better in weekly tests and end of term exams	12 (8.8%)	11 (8.1%)	6 (4.4%)	101 (74.3%)	6 (4.4%)	3.30	.694
I am satisfied with the level of students' academic performance in this school	11 (8.1%)	11 (8.1%)	3 (2.2%)	103 (75.7%)	8 (5.9%)	3.66	.638
Students perform well in practical Lessons	13 (9.6%)	9 (6.6%)	6 (4.4%)	99 (72.8%)	9 (6.6%)	3.78	.731

**Source:**  
**Primary data,**  
**2019**

Table 4.7 shows that majority of respondents agreed with the statements rated on the questionnaire. This is explained by their mean which is above 3, and their standard deviations which is close to 1. The respondents' responses were as follows;

Table 4.8 indicates that the majority of the respondents (76.5%) agreed that students have computer knowledge in their school (Mean= 3.81; Standard deviation= 0.639). Also, 85.3% agreed that students possess knowledge about the use of instructional materials (Mean= 4.06; Standard deviation= 0.745). In addition, 76.5% agreed that performance standards in terms of grade scores in this school are high (Mean= 3.60; Standard deviation= 0.617). In addition, 78.6% agreed that Students' level of self-awareness is high (Mean= 3.86; Standard deviation= 0.813). Regarding students' academic performance, 78.7% agreed that students perform better in

weekly tests and exams (Mean= 3.30; Standard deviation= 0.694). Also, 81.6% agreed that they are satisfied with the level of students' academic performance in this school (Mean= 3.66; Standard deviation= 0.638). Finally, 79.4% agreed that students perform well in practical lessons (Mean= 3.78; Standard deviation= 0.731). This implies that the level of students' academic performance in Kajara County, Ntungamo District is somewhat good as portrayed by positive responses from the participants.

**CHAPTER FIVE:**  
**DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS**

**5.0 Introduction**

This chapter presents the findings on school infrastructure utilization and students' academic performance in Kajara County, Ntungamo District. The discussion draws inferences between the present findings and previous findings from the literature. This chapter presents discussion, conclusions, recommendations and areas of further research.

## **5.1 Discussion**

### **5.1.1 Influence of physical infrastructure on students' academic performance in Kajara County, Ntungamo District**

The first objective sought to establish how physical infrastructure influences students' academic performance in Kajara County, Ntungamo District. Results from the study indicate that there is a strong positive correlation between physical infrastructure and students' academic performance in secondary schools. Findings show that availability of spacious classrooms, laboratory, equipped library, dormitories and enough space in the school have a strong bearing on students' academic performance. Results confirmed in the presence of adequate physical infrastructure in the school, there is a high possibility that secondary school students will perform better provided other aspects are kept constant.

These findings are in agreement with Chan (1996) who conducted a study on the impact of physical infrastructure on students' performance and concluded that technology and adaptabilities of physical infrastructure better equipped students for success and that to ignore that fact was to disregard the physical difficulties of learning. On classroom size, studies have shown that students in larger classes may perform more poorly resulting from reduced motivation and this leads to increased absenteeism. As classroom size is reduced, instructors have a greater chance to provide students with individual attention and can respond to the reduced class size by reallocating resources towards low-achieving students or by adopting teaching methodologies geared towards student needs (Behangana, 2017). The impact of classroom size on achievement can therefore be ambiguous, depending on the instructor's teaching method and student motivation. A well-planned and organized layout of physical classroom infrastructure does much to banish apathy, supplement inadequacy of books as well as arouse students interest by giving them something practical to see, do and at the same time helping to train them to think things out for themselves.

### **5.1.2 Influence of co-curricular infrastructure on students' performance in Kajara county,**

#### **Ntungamo District**

The second objective of this study sought to establish how co-curricular infrastructure influences students' academic performance in secondary schools. Results revealed that there is a moderate but significant relationship between co-curricular infrastructure and students' academic performance. This moderate relationship shows that even when there are other factors influencing students' academic performance, particularly physical infrastructure, co-curricular infrastructure is also partly important. Findings show that the availability of play grounds and allowing students to participate in co-curricular activities help in cognitive development and improve them participate actively during the teaching learning process.

These findings are consistent with Strong (2005) who stated that participation in co-curricular activities can help learners improve their concentration, memory and classroom behaviour and that given competent providers, physical education can be added to the school curriculum by taking time from other subjects without the risk of hindering pupil academic performance. On the other hand, adding time to academic or curricular subjects by taking time from physical education programmes does not enhance grades in these subjects and may be detrimental to health. In the same vein, Trudeau and Shephard (2015) have demonstrated that quality physical education produces important physical education benefits like increased activity and fitness while having no ill effect on academic learning. A recent large-scale study looking at the relationship between physical fitness and academic achievement, i.e., performance on standardized academic tests, conducted in California found that higher achievement on standardized tests was associated with higher levels of physical fitness.

### **5.1.3 Influence health and sanitation infrastructure students' performance in Kajara county, Ntungamo District**

The third objective in this study sought to establish how health and sanitation infrastructure influences students' academic performance in Kajara County, Ntungamo District. In this regard,

results found out that there is a strong positive correlation between health and sanitation infrastructure and students' academic performance. Findings showed that regularly sweeping of the compound, keeping classrooms tidy and clean, having a well-stocked health facility, un-congested dormitories and having clean water in the school were some of the sanitation facilities and health practices that have a strong bearing on the academic performance of secondary school students.

These findings are in line with Ddungu (2000) who noted that general cleanliness is the foremost requirement for improved sanitation. The floor should be clean, windows washed and walls maintained clean. Attention should be given to the general drainage system, water supply and toilet facilities. In the same stance, the World Bank (2005) reported that in most developing countries, sanitary conditions are often appalling, characterized by the absence of proper functioning water supply, sanitation and hand washing facilities. When it comes to schools, the World Bank (2005) warns that schools that lack access to basic water supply and sanitation services will have an increased incidence of major illness among students. Poor health is an important underlying factor for low school enrolment, absenteeism, poor classroom performance and early school dropout. In addition, The State of Environmental Report (2014) concurs with the above as it reports that sanitation-related diseases like malaria, diarrhoea, worm infection, eye infection and skin diseases account for roughly half of the entire outpatient visits in the country and the major cause of mortality and morbidity. School sanitation is very significant in the life of students as they feel healthy all the time and may have good time concentrating on their books rather than wasting time looking for treatment in health facilities.

## **5.2 Conclusions**

It was concluded that there is a strong positive correlation between physical infrastructure and students' academic performance. This confirms that when the school has sufficient physical infrastructure, there is a high possibility of performing highly academically.

It was also concluded that there is a weak but significant relationship between co-curricular facilities and students' academic performance. This shows that even when co-curricular facilities are important towards influencing students' academic performance, their influence largely depends on other factors.

Further, it was concluded that there is a strong positive correlation between health and sanitation facilities and students' academic performance. This is an indication that health and sanitation facilities in secondary schools have a strong bearing towards influencing students' academic performance. It can therefore be concluded that there is a strong significant relationship between school infrastructure utilization and students' academic performance in secondary schools in Kajara County, Ntungamo District.

### **5.3 Recommendations**

The school administration should improve the infrastructural environment for the schools so as to improve academic performance among the students in their respective schools.

The school administration should ensure that the number of toilets are adequate, kept clean and uphold privacy and that at no point should female students share such facilities with their male counterparts. This will enhance the retention of students, thereby enhancing performance.

A specific land size and proper location should be a fundamental requirement for a school registration. This should be adhered to strictly to avoid the mushrooming of schools without the vital infrastructure that enhance learning.

The school administration should not only provide a variety of co-curricular facilities but also ensure that they are well managed.

### **5.4 Areas for Further Research**

Further research needs to be conducted on the influence of government policy on school infrastructure on students' academic performance in Kajara county, Ntungamo District.

More so, the study should be conducted on the effects of school management on students' academic performance in Kajara county, Ntungamo District.

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## APPENDIX I: QUESTIONNAIRE FOR TEACHERS AND STUDENTS

Dear Respondent,

I am **DOREEN AHUMUZA** a student of Master of Arts Degree in Education Management of Kabale University carrying out an academic research on school infrastructure utilization and student's academic performance in Kajara county Ntungamo district. Therefore, the success of this research project will substantially depend on your help and co-operation. I hereby request you to respond as honestly as possible and to the best of your knowledge. The information provided will exclusively be treated with utmost confidence.

Please give answers in the spaces provided and tick (tick the appropriate)

### Section A: Physical infrastructure and students' performance in Kajara County, Ntungamo District

For each of the following statement, please tick where applicable the extent to which you agree using the Likert scale. SA = Strongly Agree; A = Agree; NS = Not Sure; D = Disagree; SD, = Strongly Disagree

No	Statement	SD	D	NS	A	SA
1.	The library is equipped with up to date and relevant textbooks					
2.	Teaching aids, maps & Charts are adequate in the school					
3.	Laboratory Chemicals and apparatus are enough in the school					
4.	Laboratories are utilized for optional subjects because of inadequate classrooms					
5.	Classrooms have adequate ventilations					
6.	The number of students' desks, teacher's chairs and tables in the room are adequate					
7.	The school has enough space for wide range of teaching and learning approaches					

**Section B: Co-Curricular infrastructure and students' performance in Kajara County, Ntungamo District**

For each of the following statement, please tick where applicable the extent to which you agree using the Likert scale. SA = Strongly Agree; A = Agree; NS = Not Sure; D = Disagree; SD, = Strongly Disagree

No	Statement	SD	D	NS	A	SA
1.	Students are allowed to participate in co-curricular activities of their choice					
2.	The school has enough sports equipment (ball, musical instruments etc)					
3.	Participation in co-curricular activities helps learners to relax and refresh the brain					
4.	Participation in co-curricular activities helps learners to reduce boredom due to overstaying in long classes					
5.	Participation in co-curricular activities play a role in the health of learners					
6.	Participation in co-curricular activities enhances the attention and concentration levels of the learners					
7.	Co-curricular activities help learners to make friends					

**Section C: Health and sanitation infrastructure and students' performance in Kajara County, Ntungamo district**

For each of the following statement, please tick where applicable the extent to which you agree using the Likert scale. SA = Strongly Agree; A = Agree; NS = Not Sure; D = Disagree; SD, = Strongly Disagree

No	Statement	SD	D	NS	A	SA
1.	Classrooms are swept on a daily basis					
2.	The school compound is always kept clean					
3.	The school provides separate toilets blocks for boys and girls.					
4.	Bathrooms and toilets are always kept tidy					
5.	The school has got a well-stocked medical facility.					
4.	There are always anal cleansing materials in the toilets (toilet paper etc)					
6.	Sanitation facilities provide high level of hygiene					

#### **Section D: Indicators of students' academic performance**

No	Statement	SD	D	NS	A	SA
1.	Students have computer knowledge					
2.	Students possess knowledge about the use of instructional materials					
3.	Performance standards in terms of grade scores in this school are high					
4.	Students level of self-awareness are high					
5.	Students perform better in weekly tests and end of term exams					
6.	I am satisfied with the level of students' academic performance in this school					
7.	Students perform well in practical lessons					

**Thank you for cooperation**

## **APPENDIX II: Interview guide for health officers and head teachers**

1. Share with me the kinds of physical facilities available in this school?
2. How would you rate the adequacy of the physical facilities in your school?
3. How have the physical infrastructure affected learners performance in the school?
4. What are the health and sanitation facilities in this school?
5. What do you do to encourage students to improve on their sanitation?
6. How have the above sanitation facilities influenced leaners academic performance in this school?
7. How often do student participate in the co-curricular activities in this school?
8. How has their participation in co-curricular activities affected leaners performance in this school?
9. Suggest ways in which co-curricular infrastructure can be improved in this school in order to enhance academic performance in this school?

**Thank you for your cooperation**