SCHOOL INFRASTRUCTURE UTILIZATION AND STUDENTS' ACADEMIC PERFORMANCE IN SELECTED PUBLIC SECONDARY SCHOOLS IN ZOMBO DISTRICT, UGANDA

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DECLARATION

I, Obedling Johnson Thombu declare that this is my original work and has not been submitted for any award in any institution.

Signature  Date: 22-02-2024

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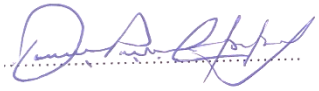
APPROVAL

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

Signature:  Date: 22-02-2024

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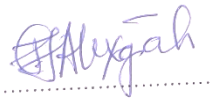
Signature:  Date: 22-02-2024

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DEDICATION

I dedicate this dissertation to Hon. Betty Udongo and my late father Amula Gideon for their support of me.

ACKNOWLEDGEMENTS

This dissertation is not entirely my effort; several people contributed in one way or another towards its completion. First, I, thank the almighty God for the wisdom and good health.

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My appreciation goes to my family, relatives, and friends who always endeavoured to wish me success and for the great encouragement.

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ABSTRACT

The study aimed to examine the effect of school infrastructure utilization on students' academic performance in selected public secondary schools in the Zombo district of Uganda. The objectives of the study were to examine the effect of direct school infrastructure utilization, indirect school infrastructure utilization, and co-curricular infrastructure utilization on students' academic performance in selected public secondary schools in the Zombo district of Uganda. A cross-sectional study design was used. Both quantitative and qualitative approaches were adopted with a sample of 224 respondents. A simple random sampling technique was used to select amongst the students, while purposive sampling was used to select the headteachers and directors of studies. Quantitative data analysis consisted of descriptive statistics (frequencies and percentages) and inferential statistics (Pearson correlation) while qualitative analysis used a thematic approach. Findings revealed a moderate positive correlation (r = .503) between direct infrastructure utilization and students' academic performance; a moderate positive correlation (r = .475) between indirect infrastructure utilization and students' academic performance; a weak positive correlation (r = .382) between co-curricular infrastructure and students' academic performance. Results of regression analysis of the independent infrastructure utilization variables (direct, indirect & co-curricular) revealed that a unit increase in direct infrastructure utilization leads to an improvement in students' academic performance by 30.3%, indirect infrastructure utilization by 35.6%, and co-curricular infrastructure utilization by 43.6% and all were statistically significant at 1%. However, results of joint regression indicate that direct infrastructure utilization (19.5%) improves academic performance better than co-curricular (16.8%) and direct infrastructure utilization (13.9%). Thus, it was concluded that school infrastructure utilization significantly affected academic performance in selected public secondary schools in the Zombo district of Uganda. It is recommended that secondary schools in the Zombo district of Uganda should focus on school infrastructure utilization to improve students' academic performance.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This study examined how well certain public secondary schools in Uganda's Zombo District used their educational infrastructure and how well their students performed academically. Students' academic achievement served as the dependent variable, while school infrastructure was measured in direct, indirect, and co-curricular infrastructure. This chapter includes information about the study's background, problem statement, purpose, objectives, research questions, research hypotheses, conceptual study's importance, investigation rationale framework, study's importance, study's justification for the investigation, study's scope, and operational definitions.

1.2 Background to the study

The background was organized into four categories: theoretical, conceptual, historical, and contextual. Theoretical knowledge explains the key concepts or variables used in this study, while conceptual and contextual knowledge explains how much the use of school infrastructure affects academic performance. The empirical justifications for the dependent and independent variables are presented in the theoretical knowledge section of the study. The historical context highlights historical trends surrounding the use of school infrastructure.

1.2.1 Historical perspectives

According to the World Bank and the Ugandan constitution, access to education is a fundamental human right, particularly at the lower levels of primary and secondary education. It is both an investment in people that is made globally and a useful resource for the economic development and expansion of any country (World Bank, 2018). In 2000, countries from all over the globe

ratified the Dakar, Senegal convention to guarantee everyone has access to education (UNESCO, 2003). Buildings, classrooms, labs, bathrooms, playgrounds, and other amenities are crucial for learning and, as a result, for students' academic success (World Bank, 2017, Barret, 2019). According to research, academic performance requires a well-designed school with a secure learning environment (Cash, 2016; Earthman & Lemaster, 1996). Physical amenities are essential for a school to accomplish its objectives and do well overall on national exams. Secondary schools frequently exhibit insufficient restrooms, dormitories, classrooms, and laboratories, according to Ahumuza (2020)

Uganda's first schools were established by European missionaries in the late nineteenth century, especially from 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 to prepare them for jobs as clerks and other civil workers. Contrary to Aguti's (2002) claim that the missionaries aimed to educate the children of chiefs rather than the public, the Education Policy Review Commission Report (1989) shows that certain mission schools provided equal opportunities to children from all socioeconomic groups. To combat illiteracy, missionaries-built church schools wherever they founded a mission or in its outposts, as stressed by Ssekamwa (2014).

This is further emphasized by the Uganda Episcopal Conference Education Policy (1997), which affirms that religious organizations in Uganda initiated formal school education to eradicate ignorance from society. These religious schools were the forerunners of the current primary schools founded by the church. As emphasized by the Education Policy Review Report (1989), most of the pupils attended unsubsidized tiny rural schools known as Church Schools. Ssekamwa (2014) adds that "unfortunately, there was little financial support by the colonial government for

the missions in their educational work" (p. 302) in support of the claim. The financial oversight of the schools was partially under the control of the colonial government, nevertheless. In this regard, the same author makes the further observation that "governments were mainly concerned with grants to aid in running the mission schools throughout the colonial era, but missionaries controlled the system of education."

The colonial administration in Uganda attempted to establish laws and practices for educating the Ugandan people even before the arrival of the missionaries. The British Colonial Policy of 1923 directed British colonial administrators in Uganda to offer education for African children. Soon after, under the direction of Eric Hussey, Uganda formed the Department of Education, and the Phelps-Stokes Commission of 1924–1925, sponsored by the United States, was established (Ssekamwa, 2014). Following that, better schools were constructed, teacher evaluation and training programs were put in place, and official recognition of government grants was given. But as Ahumuza (2020) points out, the Thomas Education Committee recommended that governments get engaged in subsidizing schools, which is when significant state sponsorship of education started, according to Magara (2009).

The De La Warr Commission suggested in 1937 that Makerere be established as a regional university college servicing the British East African territory. The government at the time was eager to hire numerous Africans. According to the Education Policy Review Commission Report (1989), the 1951 Binns Commission encouraged Uganda's rapid educational development for this reason. However, that type of education did not advance the country. Ssekamwa (2014) claims that "the main aim was to produce white-collar workers, whose preoccupation was to seek out already created jobs, instead of creating new jobs" (p. 307). The 1953 Report on African Education in Uganda, however, was the result of a committee headed by Bernard de Bunsen that placed a

strong emphasis on the Africanization of education and the training of highly skilled professionals needed for the country's economic development (Education Policy Review Commission Report, 1989).

Under the leadership of E. B. Castle, the Ugandan government established a panel in 1963, and the commission recommended combining elementary and junior secondary schools. It emphasized both qualitative and quantity expansion at the primary level. The Castle Commission emphasized the importance of increasing girls' educational opportunities. Under the leadership of Senteza Kajubi, the government established a new commission in 1977 to reform Uganda's educational system. However, due to the liberation war of 1978–1979, neither the findings nor the recommendations of the Kajubi Commission were published. As a result, save from a few policy changes, Uganda's educational system has been structured following the 1963 Castle Commission Report on Education in Uganda. Considering this, Juuko and Kabonesa (2007) contend that Uganda's current educational system has been in place since the time of the missionaries, more specifically since 1965, when the Castle Education Commission Report on Education's recommendations were implemented. This illustrates how out-of-date the system is and how urgently it needs to be updated and revised (Uganda government white paper, 1992).

As Universal Primary Education (UPE) and Universal Secondary Education (USE) were adopted and implemented in 1997 and 2007 respectively, the demand for secondary education grew (UNESCO, 2014; Tsimpo & Wodon, 2016a; Uganda Education Statistical Abstract, 2009). Despite significant efforts to expand secondary school enrolment and access, Uganda's academic performance has lagged behind other African countries for many years, according to the World Bank's education report for those countries. This seems to be influenced by the standard of the school's infrastructure. A crisis of high school dropouts and poor performance has hindered academic performance in most secondary schools in Uganda (UNESCO, 2008). However, no one

has ever identified how, in recent decades, student academic progress in the Zombo district of Uganda has been impacted by the utilization of school facilities.

1.2.2 Theoretical perspective

This work was built upon Rousseau's Classical Liberty Theory, which he developed between 1712 and 1778. According to the classical liberty hypothesis, every individual has a sizable amount of potential to achieve more from birth. To remove any obstacles in a person's life, whether they are institutional or structural, the educational system should be established. The classical liberal theory claims that allowing everyone equal access to education will promote social mobility.

Rousseau, the theory's proponent, believed that as long as society compensates members following their standing, personality traits shouldn't be a threat to social justice. As a result, social institutions like educational institutions should work to foster an enabling atmosphere by providing, and utilizing the infrastructure required for academic success. By providing, and utilizing the necessary facilities, the educational institution should treat all students equally. Students should also take advantage of educational opportunities to improve their test scores. It is crucial to equip students from all parts of the country with the physical infrastructure that is utilized well to provide equal access to education, as doing so will ultimately improve their living situations and, in turn, their academic achievement. Knowledge of the classical liberty theory is necessary to comprehend how learning is performed through beneficial interactions between students and resource utilization. The concept, the author argues, is also useful for comprehending how school infrastructure utilization affects students' academic performance. Therefore, the goal of the current study was to evaluate how well certain public secondary schools in Uganda's Zombo area were using their school facilities.

1.2.3 Conceptual perspective

The utilization of school infrastructure is the independent variable in this study, whereas academic accomplishment is the dependent variable. The quality and quantity of knowledge, abilities, procedures, and positive attitudes, behaviors, and philosophies that learners attain or acquire are referred to as academic performance, on the other hand (Ferguson, 1990), as quoted by Ahumuza, (2020). The ability of students to achieve anything is referred to as their performance (Oxford Advanced Learners Dictionary, 2014). This ability is assessed by the students' performance on a test or examination that is given at the end of a subject, academic term, academic year, or educational cycle. The grades and test results for each student demonstrate their level of proficiency. The standard of the grade and the percentage of candidates who pass in various grades establish the level of academic accomplishment in each class or institution over the length of a specific examination, whether internal or external (Ferguson, 1999).

Academic performance in this subject will be determined by the caliber and quantity of acquired knowledge, skills, techniques, constructive attitudes, behavior, and philosophical understanding (Ferguson, 1990). This competence is assessed by the student's performance on a test or examination that is given at the end of a subject, academic term, school year, or educational cycle. Each student's grades and test scores, according to Ahumuza (2020), indicate their level of achievement. The independent variable in this study will be school infrastructure. School infrastructure refers to a collection of connected structural components that serve as the basis for a whole development structure. The researcher will focus on the physical infrastructure, health and sanitary infrastructures, and co-curricular facilities for the study, with an emphasis on the caliber of classrooms, libraries, and laboratories. In addition to making, it difficult for students to focus, crowded classroom environments unavoidably reduce the amount of time teachers can devote to creative instructional strategies like group projects and cooperative learning. Infrastructures known

as co-curricular facilities are designed to help children make social and physical changes. Fields, recreation centers, and spaces for indoor games are a few examples of them.

Good sanitation, as described by the School Sanitation Consultative Meeting Report (1999), is when the environment is clean on both an individual and communal level. Maintaining personal hygiene includes using safe methods for collecting, storing, and using clean water, especially for drinking. Therefore, clean bathrooms and toilets, a clean drainage system, access to a hand washing station, and well-maintained trash cans all constitute appropriate sanitation.

Infrastructures known as co-curricular facilities are designed to help children make social and physical changes. Fields, recreation centers, and spaces for indoor games are a few examples of them.

1.2.4 Contextual perspective

The provision of educational physical facilities at Zombo's secondary schools is unbalanced, according to a report from the district's education office dated 2021. In most schools, classes typically have 80 to 100 students. There are some schools with insufficient libraries, staff offices, labs, restrooms, and classrooms. While some schools have leaking roofs and muddy, dusty floors, others lack properly fitting doors and windowpanes. According to Kajubi (2012), many schools appear to have poor upkeep and dusty conditions that could be harmful to the health of students and staff. This layout doesn't seem to provide a conducive learning environment, which could negatively impact the students' academic progress in the long run as well as the teaching and learning process.

Records from Zombo District Education (2021) show that the district's secondary schools perform as expected on national exams. According to a recent article in the Daily Monitor newspaper from February 2017, the Zombo District in West Nile was among the worst-performing areas in the nation; none of the students who took the UCE exams in 2016 received a first-place result. Poor performance has been attributed to several factors. These include the inadequate provision of high-quality educational facilities and the inadequate planning of educational physical facilities. To comprehend the potential influence these facilities may have on the quality of education their children get, school administrators and parents should be informed of the state of the infrastructure at their children's schools (Tiberondwa, 2012). Therefore, the researcher needed to determine how schools' physical facilities impacted pupils' academic performance in the Zombo District.

Table 1: UCE results for selected schools in Zombo district 2020 – 2016

Year	Div 1	Div 2	Div 3	Div 4	Div 7	Div 9	Total
2020	14	58	156	176	1	10	**440**
2019	4	41	130	236	0	29	**440**
2018	9	52	115	234	2	67	**462**
2017	4	39	94	271	0	49	**447**
2016	0	36	87	326	1	88	**541**

Source: UNEB Results for individual schools

From the above table, students' academic performance at UCE from 2016 – 2020 has been generally poor and this may be partly attributed to the school infrastructures that are available in the schools under the study.

Table 2: UACE results for selected schools in Zombo District 2022 - 2016

Year	3 Principles	2 Principles	1 Principle	Subsidiary pass	Failure	Total Number of candidates
2022	03	05	06	02	00	16
2020	05	09	09	09	01	33
2019	04	07	06	07	01	25
2018	03	02	08	12	01	24
2017	03	10	07	07	00	27
2016	07	05	07	01	01	18

Source: UNEB Results for individual schools

1.2.5 Statement of the problem

The infrastructure of the school plays a crucial role in secondary schools realizing their educational goals. A good school infrastructure environment, according to UNESCO (2010), the World Bank (2017), and Barret (2019), includes buildings in good condition, including an adequate number of efficiently organized classrooms, libraries, labs, computer labs, and playgrounds, as well as access to an adequate number of sanitary facilities, clean drinking water supplies, electricity, ventilation, and light. According to Uwimana and Andala (2020), school infrastructure is crucial in the growth of both school performance and student academic performance. There is compelling evidence that improved instruction, higher student outcomes, and lower dropout rates are all made possible by high-quality infrastructure (Barret, 2019).

Uganda is not an exception to the rule that many nations utilize a fragmented approach to investing in their education infrastructure, even though education officials are increasingly emphasizing the quality of education and school learning environments (World Bank, 2018b). As a result, Uganda, like many other low-income nations, has significant gaps in its educational infrastructure (Tsimpo & Wodon, 2016a). The disparities are significantly more pronounced in the Zombo District and the West Nile sub-region in general. Poor performance might have been a result of this (Tugineyo,

2018, NAPE reports, 2018). Analysis of the 2020 UCE UNEB Examination results shows that academic performance in secondary schools in the Zombo area has continued to decline (UNEB Results, 2022). The inadequate and poor quality of the school infrastructure may be to fault for this.

Based on the context, the researcher had to ascertain how the use of school infrastructure in the Zombo District of Uganda affected students' academic performance, specifically how direct infrastructure, indirect infrastructure, and co-curricular infrastructure affected students' academic performance in the selected public secondary schools in Zombo.

1.3 Purpose of the study

The study aimed to ascertain how the utilization of school infrastructure affected students' academic performance in a sample of public secondary schools in the Zombo District.

1.4 Objectives of the study

This study sought to achieve the following objectives:

1. To establish the effect of direct infrastructure utilization on students' academic performance in selected public secondary schools in the Zombo District.

2. To investigate the effect of indirect infrastructure utilization on the academic performance of students in selected public secondary schools in the Zombo District.

3. To determine the effect of co-curricular infrastructure utilization on the academic performance of students in selected public secondary schools in Zombo District

1.5 Research Question

The research was guided by the following questions.

1. How does direct infrastructure utilization affect students' academic performance in selected public secondary schools in Zombo District?

2. Does indirect infrastructure utilization affect students' academic performance in selected public secondary schools in Zombo District?

3. What is the effect of co-curricular infrastructure on the academic performance of students in selected public secondary schools in Zombo District?

1.6 Research Hypothesis

The study tested the following research hypotheses:

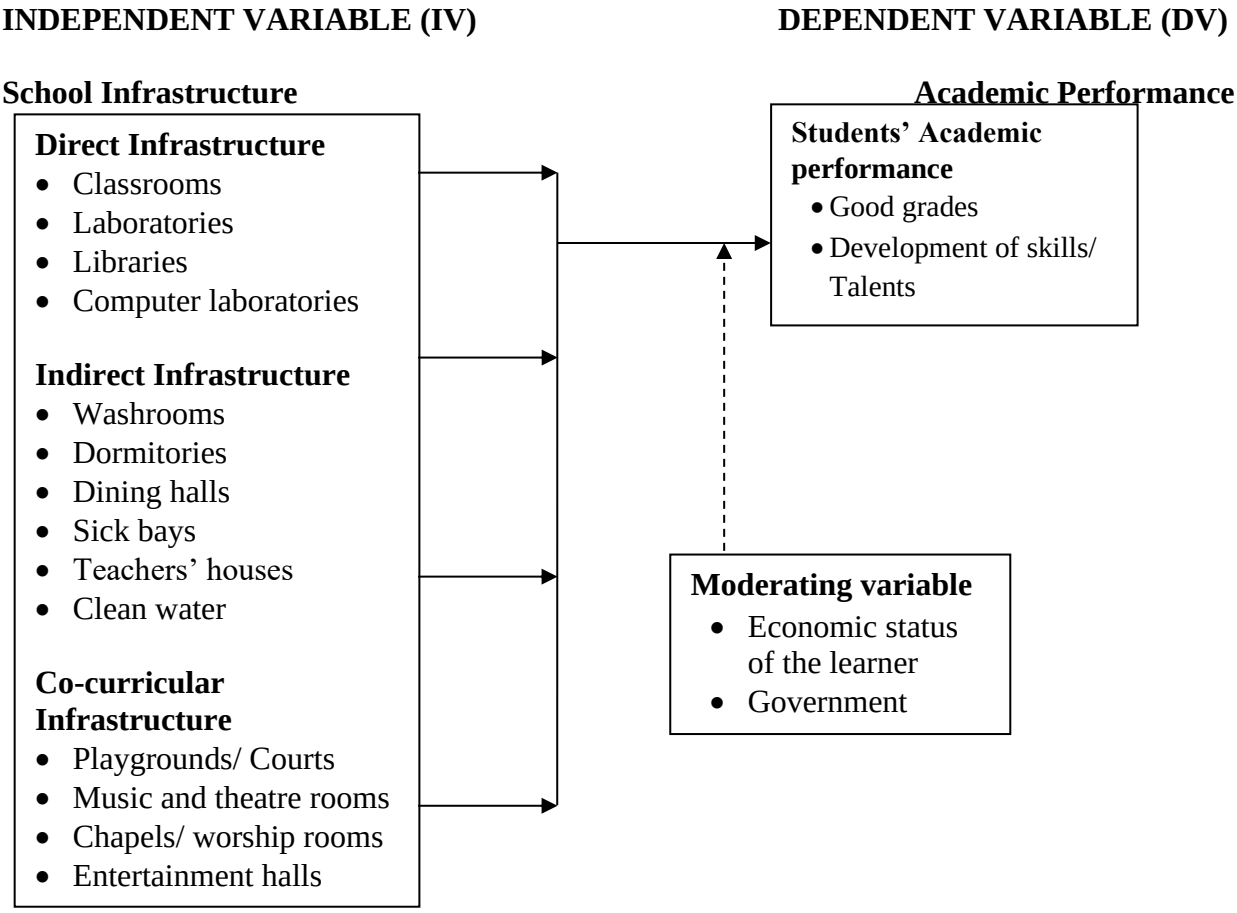
1. There is a significant effect of direct infrastructure utilization on the academic performance of students in selected public secondary schools in the Zombo District.

2. Indirect infrastructure utilization significantly affects students' academic performance in selected public secondary schools in Zombo District.

3. There is a significant effect of co-curricular infrastructure utilization on the academic performance of students in selected public secondary schools in the Zombo District.

1.7 Conceptual framework

Figure 0-1**: Conceptual Framework**



Source: self-conceptualized as guided by Armstrong 2010

Utilization of the school infrastructure and student academic achievement served as this study's independent and dependent variables, respectively. Direct, indirect, and co-curricular school infrastructure utilization were analysed, and student academic achievement was evaluated regarding good grades and developing skills and talents. Figure 1 depicts how the independent variables affect the dependent variables. The underlying premise was that kids would perform better academically, and the more effective direct, indirect, and co-curricular infrastructure was utilized. On the other hand, a student's academic performance will suffer from the less effective direct infrastructure, indirect infrastructure, and co-curricular infrastructure utilized.

1.8 Significance of the study

The Ministry of Finance and Development, the Ministry of Education and Sports, and the Ministry of Finance and Development may find this study to help formulate policies and strategies to promote the development of infrastructure in secondary schools to increase students' access to education and the disbursement of infrastructure funds to Uganda's public schools to realize Uganda's Vision 2040, the Sustainable Development Goals #4, and the National Development Plan III.

As stakeholders, the head teachers, the Board of Governors, and the Parent and Teachers Association (PTA) may find the study's findings beneficial in understanding the infrastructures that influence kids' academic success.

The findings of this study will form a basis for further researchers who might be interested in advancing, this study in the other region of this country.

1.9 Justification of the study

Low levels of student academic achievement are caused by poor and insufficient school infrastructure in the West Nile sub-region, particularly in the Zombo district. However, no research into the issue has been done in the Zombo district. This study was significant because it provided more information on how school infrastructure is used and how well pupils are performing academically in a sample of public secondary schools in the Zombo District.

1.10 Scope of the study

This was in three folds, that is.

Content scope: The study was interested in dealing with school infrastructure utilization and students' academic performance**,** specifically**:**

To examine how using the infrastructure directly affects students' academic performance in a few chosen public secondary schools in the Zombo District.

To examine how students' academic performance is affected by indirect infrastructure use in a few chosen public secondary schools in the Zombo District.

To ascertain how co-curricular infrastructure use affects students' academic performance in a few chosen public secondary schools in the Zombo District.

Geographical scope: In this instance, the geographical scope consisted of public secondary schools in the Ugandan district of Zombo.

Time scope: The study considered five years from 2017-2022.

1.11 Operational Definitions

The World Bank defines school infrastructure as the network of school facilities, campus grounds, buildings, furniture, and equipment that enable teachers and administrators to offer educational services following a country's regulatory framework.

School infrastructure refers to the indirect teaching support facilities such as offices, cafeterias, acoustics, toilets, laundry, mowers, residential halls, common rooms, cleaning materials ground, and similar items that satisfy the individual's physical and emotional needs. They are used to increase instructional effectiveness, improve the cleanness, orderliness, and safety of facilities, reduce the operational cost and life cycle cost of a building, extend the useful life of a building, increase efficiency and effectiveness of the staff and students, improve building appearance, use

data collection and analysis for decision making (Asiabaka, 2008) as cited in Gamariel (2018). For this study, school infrastructure is defined in the following ways:

Direct infrastructure refers to the physical space and equipment that support teaching and learning, they include classrooms, laboratories, libraries, and computer laboratories.

Indirect infrastructure refers to the physical infrastructures that support students to stay in schools such as dormitories, teachers' houses, washrooms, dining halls, and sickbay among others.

Co-curricular infrastructure refers to those facilities that are meant to bring social and physical adjustment in a student such as playgrounds, rooms for indoor games, worship places, and entertainment rooms among others.

Infrastructure refers to the fundamental programs and services required for an organization to function properly. The physical infrastructure of the schools was the main focus of this investigation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This study reviews the literature on how the use of school infrastructure affects students' academic performance, paying particular attention to the direct, indirect, and co-curricular infrastructure and how each of these factors affects students' academic performance.

2.2 Theoretical Review

Classical Liberty Theory was especially used as a guide for this investigation. Rousseau proposed the classical liberty idea between 1712 and 1778. According to the classical liberty idea, everyone is born with a significant amount of potential; as a result, the educational system should be developed to remove any limitations in a person's life, whether they be institutional or physical (Orodho, 2003). According to the classical liberty theory, granting everyone the same access to education will help to encourage social mobility.

Rousseau believed that if society pays people following their standing, personality traits shouldn't be a threat to social fairness. As a result, social institutions like educational institutions should work to create an enabling atmosphere by providing the infrastructure required for academic success. People should take advantage of educational possibilities and do better on exams, and educational institutions should treat everyone equally by providing, and utilizing the necessary facilities (Orodho, 2003). Therefore, it is important to make sure that students from all regions of

the nation have access to the physical infrastructure required, and utilized to offer equal possibilities for education access, which will later raise their living standards.

The study was also influenced by Skinner's (1985) Motivational Theory of Learning. It claims that the predicted reward affects students' motivation to complete a task. When the teacher is effective at motivating the learner, learning will be efficient. Both extrinsic and intrinsic stimuli have the potential to stimulate this drive, and both are critical in guiding and controlling the learner's behavior toward the accomplishment of the desired goals. Therefore, motivating students should be done through a variety of methods, such as giving them career advice, providing, and utilizing the necessary physical amenities like libraries, labs, dorms, and playgrounds, and verbal support. This would significantly enhance their academic achievement. Since this theory promotes the development of school infrastructures, and their utilization to improve learning and, consequently, academic achievement, it was pertinent to our study.

According to Obama (2004), parents are primarily responsible for establishing in their kids a work ethic and a desire to succeed in school. He said, "If we are to make the investments necessary to renovate our schools, then we will need to rediscover our faith that every child can learn and not, that is neither stupid nor impossible, but perhaps a slow learner."

The Human Capital Theory (Adam, 1776/1952; Mill; 1848; Marchall; 1890), which holds that investing in people has economic advantages for both individuals and society, also served as a guide for the study. According to Schultz (1962), education is thought to improve nutritional status and overall health. Education also tends to improve the general quality of life and influence population growth control (Becker, 1993). Education also gives people the tools they need to

become informed citizens who can take part in their nations' democratic processes (Swanson and King, 1991).

Education and knowledge expansion are two key drivers of economic progress. They are not natural resources; rather, they are largely man-made, which necessitates savings and investments. There is proof that those with higher levels of education and competence almost invariably make more money than others (Schultz, 1963, p. 46). Therefore, countries should invest in school infrastructure, and their utilization to enable access to education by all necessary for the attainment of human capital development. This theory, therefore, resonates with the need to provide the school infrastructure necessary for human capital development.

2.3 Conceptual Review

Utilization of the educational infrastructure served as the independent variable in this study while academic performance of the students served as the dependent variable. Academic performance refers to the quality and quantity of knowledge, skills, techniques, and positive attitudes, behaviors, and philosophy that learners achieve or acquire (Ferguson, 1990). Students' performance is defined as the ability of students to attain something (Oxford Advanced Learners Dictionary, 2014). The student's performance on a test or examination that is administered after a subject, academic term, academic year, or educational cycle is used to measure this ability. Each student's grades and scores reflect their level of achievement. The degree of academic achievement in each class or institution throughout a specific examination, whether internal or external, is determined by the quality of the grade and the proportion of candidates who pass in various grades (Ferguson, 1999).

The quality and quantity of knowledge, skills, techniques, positive attitudes, behavior, and philosophical attainment or acquisition were indicators of academic performance in this study (Ferguson, 1990). The student's performance on a test or examination that is administered after a topic, school term, year, or educational cycle is used to measure this skill. Each student's grades and scores reflect their level of achievement.

School infrastructure utilization served as the independent variable in this study. According to standard definitions, school infrastructure refers to a collection of interrelated structural components that serve as a framework for sustaining a comprehensive development structure. For the study's aims, the researcher focused on physical infrastructure, health, and sanitation infrastructures, as well as co-curricular facilities, and will continue to concentrate on physical infrastructure utilization with a primary focus on the caliber of classrooms, labs, and libraries. In addition to making, it difficult for students to focus, crowded classroom environments unavoidably reduce the amount of time teachers can devote to creative instructional strategies like group projects and cooperative learning. Infrastructures known as co-curricular facilities are designed to help children make social and physical changes. Fields, recreation centers, and spaces for indoor games are a few examples of them.

According to the School Sanitation Consultative Meeting Report (1999), which defined good sanitation as both individual and communal cleanliness, good sanitation is when the environment is clean. Food hygiene procedures, secure collection, storage, and use of clean water, especially for drinking, are all parts of maintaining personal cleanliness. Therefore, clean bathrooms and

toilets, a clean drainage system, access to a hand washing station, and well-maintained trash cans all constitute appropriate sanitation.

Infrastructures known as co-curricular facilities are designed to help children make social and physical changes. Fields, recreation centers, and spaces for indoor games are a few examples of them.

2.4 Review of Related Literature

This section reviewed the literature on the following objectives:

To look into how using the infrastructure directly affects students' academic performance, to look into how pupils' academic performance is affected by indirect infrastructure use, and to assess the impact of co-curricular infrastructure use on students' academic performance in a sample of Zombo District public secondary schools.

2.4.1 Direct infrastructure utilization and students' academic performance

Learning infrastructure in the context of this study includes classrooms, libraries, laboratories Computer laboratories, among others. A study was done by Ana et al., (2015): A study of the research on school infrastructure and students' educational outcomes, with a focus on Latin America, found some evidence that new school construction and school libraries boost enrolment and learning. The research also offers some evidence that restrooms enhance education and that access to safe drinking water and laboratories boost enrolment. Although the main conclusion of this study is that the evidence base is weak, the current study was conducted in a developing country, specifically Uganda, West Nile Zombo District. Several studies have shown that

enrolment increases with a reduction in the distance to the nearest school (World Bank, 2018, Kennedy et al., 2017).

(2020) Kennedy et al. The relationship between students' academic achievement and the board of managers' infrastructure development policies in Kenya's Nyamira County public secondary schools. Inferential statistics was utilized as the method for data analysis, and a convergent parallel mixed method study design was employed to choose the sample size. Questionnaires, interview guides, and observation were used as tools for data collection. The conclusion was that students' academic performance was significantly impacted by the lack of suitable infrastructure, such as classrooms, libraries, laboratories, and computer labs. The results of this study are consistent with those of Farooq, M., and Ahmed, R. (2021). Academic achievement of students and classroom management techniques. Anang Amiruddu Nugroho and Udik Budi, (2020) observed that the state of the classroom which is part of the school building, when in good condition will support teaching and learning, students will feel comfortable, excited, and facilitated in the teaching, learning process, hence academic performance.

Philothere et al. (2020) conducted a study. factors that affect academic achievement in a few Rwandan public secondary schools. Frequencies, ratios, percentages, and regression analysis were used to analyze the data, which was collected using a questionnaire and document review guides following the notion of the education production function. The results showed that student academic performance was positively impacted by the availability of physical resources like libraries and laboratories. The quantity and caliber of the library's resources have a big impact on how well pupils learn and perform in school (Bello, 2018). This is the same perspective that Bala

et al.'s (2020) study expressed. Academic library services' effects on students' achievement and performance are discussed. Although the results from the studies mentioned above indicate a good correlation between the availability of libraries and academic achievement, these studies were conducted outside the Zombo district, therefore the researcher needed to conduct this study to determine whether or not the results were accurate.

According to Ngozi's (2020) research. Studying how students performed on the National Examinations Council (NECO) and the West African School Certificate (WASC) in public schools in the Orlu Education Zone in Imo State, Nigeria, revealed the importance of the school library to students' math performance. Used correlation survey research design, a purposive sampling technique, SSCE for data collection technique and analyzed data using frequencies and percentages, tested hypothesis using chi-square. The conclusion was that the library had little bearing on pupils' academic achievement in mathematics. The researcher had to conduct the research in the field since the study region was distinct from that of the prior research and there were discrepancies in the findings regarding the impact of library infrastructure on students' academic achievement.

A research effort was carried out in 2018 by Siham Gaber and Farag. The results demonstrated that incorporating ICT in the teaching and learning process improves the teaching and learning environment and that there was a discernible improvement in student performance. This was done using a computer laboratory teaching management system.

Will et al. (2020) state the following. "The effect of computer use and seat placement in the classroom on students' academic performance" The study's conclusions demonstrated that pupils'

academic performance was significantly impacted by their place in the classroom and by the use of computers. However, these studies were done outside the researcher's study area, the researcher, therefore, had to research to find out exactly if the findings could be the same or not in his study area.

In a study by Jinnan et al. (2018), students in China were asked about their in-class and out-of-class cyberloafing habits. The findings revealed a negative correlation between in-class cyberloafing and academic performance and an inverted U-shaped relationship between out-of-class cyberloafing and academic performance.

To collect data, Kanyoi (2019) employed a descriptive survey design, questionnaires, and interview guides. Data were then analyzed using SPSS and content analysis for qualitative data. The results revealed deficiencies in ICT infrastructure. Whereas computer laboratories were available in the sampled schools, they were inadequate for use in teaching and learning, hence negatively affecting students' performance.

The researcher had to do the study in my study area to determine the impact of computer labs on the academic performance of chosen secondary schools in the Zombo District of Uganda due to discrepancies in the data.

According to a Kosgei, (2018) study. Adequate laboratories and their impact on chemistry performance in secondary schools in Kenya's Uasin Gishu County's Kesses sub-county. Descriptive and correlation research design was used, with stratified random sampling to get the parent population, simple random sampling to get the sample population, questionnaire as the data

collection method. The results revealed a very substantial correlation between laboratory suitability and academic achievement.

2.4.2 Indirect infrastructure utilization and students' academic performance

Physical infrastructures including restrooms, dining rooms, dorms, and staff homes are all included in indirect infrastructure. Not only do technical specifications need to be developed; but qualitative and adequacy aspects also need to be taken into account to plan and build effective boarding facilities and improve the physical learning environments (Marton and Booth, 2007).

Researchers Beer (2005) and Watson (2003) found that housing teachers and kids on the school grounds has a significant positive impact on student achievement. She established that teachers who remain on the school grounds can use remedial teaching to assist students outside regular class hours.

Solid waste disposal, drainage, and enough water for toilet cleansing and personal hygiene should all be included in sanitation facilities. Gogo (2002) and Wilkens, White, and Kinder (2003) both assert that the materials used in creating schools and the kind of buildings determine the degree of cleanliness. When schools are kept clean, children get drawn to them and motivated, which helps them perform well academically (Kinder 2003).

In a study done by Waga. (2013) on the influence of school water, sanitation, and sanitation programs on pupils' academic performance among rural public primary schools in Maseno division, Kisumu County, Kenya. The finding revealed that access to safe drinking water, availability and access to sanitation facilities, provision of hand washing facilities, and hygiene

education positively influenced the performance of pupils in rural primary schools in the Maseno division.

According to Comfort, O, A and Veronica, O, A, (2016) The impact of physical facilities on students' level of motivation and academic performance in senior secondary schools in southwest Nigeria. Adopted ex-post-design, questionnaire, and inventory to collect data. The results showed that there was a significant relationship between physical facilities and students' level of motivation and academic performance.

Amadi, E, and Chinyere, R, (2019) conducted a study. Physical resources availability and the academic performance of students in the universal basic education scheme, Rivers State. The descriptive survey design was used, the mean and standard deviation were used in analyzing the questions, Z-test was used in testing the hypothesis. The findings revealed that both students and teachers need facilities like libraries, laboratories, good buildings, classrooms, good water supply, toilet facilities, and security among others for teaching and learning to take place.

The researcher had to carry out the study in his study area to determine the effect of physical facilities on students' academic performance in the Zombo district of Uganda to validate the findings or not.

Yakubu (2017) states the following "Space for convenience planning and academic performance of secondary school students in Oyo State, Nigeria. A descriptive survey research design of the ex-post-facto type was adopted. The study concluded that toilet and water facilities contribute immensely to students' academic performance.

In a study by Abbas. (2021) the association between the presence of sanitation facilities and school enrolment in Pakistan. The finding revealed that a school with a toilet facility is correlated with increased enrolment.

All these studies were done outside the researcher's study area, which was why the researcher had to conduct this particular study to validate the findings or not.

Nabaseruka (2010) conducted a study on the effects of students' living conditions on their academic performance in secondary schools of Gomba sub-county, Mukono district. A cross-sectional survey design using both quantitative and qualitative methods was used. The findings suggested that living conditions affected students' academic performance positively where the living condition was good, and negatively where the living condition was bad. Since 2010 a lot could have changed which is why the researcher needed to carry out this particular research to validate the findings or not.

2.4.3 Co-Curricular Infrastructure Utilization and Students' Academic Performance

Fields, music studios, and theatres are just a few examples of the co-curricular infrastructure that allows students to participate in many activities that assist in developing them physically, socially, cognitively, and emotionally Ng'anga (2003). For the development of talent, it is important to have access to appropriate playing fields and the essential tools. To develop students' talents, co-curricular infrastructure should be strategically placed and well-organized (Khaemba, 2007).

Modern educational practices, according to Stephens and Schaben (2014), place a strong emphasis on students' overall development. It is considered that the goal of education itself

would not be achieved if there is not a balance between extracurricular and curricular activities. According to Broh (2012), extracurricular activities can improve students' academic achievement when they are well-managed and supported by the school administration.

Strong (2005) asserts that involvement in extracurricular activities can aid students in improving their focus, memory, and classroom behavior and that, in the hands of capable teachers, the addition of physical education to the school curriculum can be made without running the risk of impairing students' academic performance. On the other hand, taking time away from physical education classes to add to academic or curricular courses does not improve student performance in these areas and may even be harmful to their health. Trudeau and Shephard (2015) have shown that high-quality physical education has no negative effects on academic performance while producing significant physical education advantages including increased exercise and fitness. In California, a recent large-scale study investigating the link between physical fitness and academic accomplishment, or performance on standardized academic examinations, discovered a correlation between higher levels of physical fitness and higher achievement on standardized tests.

It is impossible to exaggerate how important sports are to the instructional process in educational institutions. Numerous studies have demonstrated a link between student participation in athletics and other sport-related activities and academic achievement, including those by Matano (1992) and Newman (2005), among others. Sports participation has several advantages. According to Seaton et al. (1965), Durojaie (1976), and John and Campbell (2011), playing sports improves physical fitness and promotes excellent health. The vigor and alertness

of people who actively participate in sports are higher than that of non-participants (Weinberg and Gould, 2012).

Ekperigin and Uti (2016) assert that involvement in extracurricular activities promotes excellent body composition or posture, which they define as the balanced growth of the entire body as well as the strength and fitness of all muscles. As a physical activity, sports encourage cooperation and teamwork among students as they work towards a common objective. Arnoldy (2005) observes that sports can be used as a means of establishing a safe space and gaining access to the public realm in his commentary on the return of sports in Afghanistan.

In a study on infrastructure problems and students' academic performance: evidence from emerging Nations done in 2022 by Prince Dacosta Anaman et al., it was discovered that schools needed sports fields, music rooms, church halls, mosques, and theatres for students to perform better.

In a study on the relationship between secondary school students' academic achievement and the use of school infrastructure in Uganda's Kajara County, Ntungamo district, Ahumuza Doreen (2020) discovered a marginally favorable relationship between co-curricular facilities and academic achievement.

In a study on the impact of co-curricular activities on student’s academic achievement at the secondary school level in southern districts of Khyber, Pakhtunkhwa, Nasir et al. (2018) both the results and discussion visibly show that co-curricular activities have a positive impact on students’ academic achievement.

In a study on the impact of students' involvement in co-curricular activities on academic performance in Kenya's Gem sub-county, Siaya County, Othoo, H. O, & Omondi, K. (2022) concluded that participation in co-curricular activities positively influences students' academic performance.

Rabia et al. (2020) conducted a study on the effect of sports facilities on the academic performance of female students of elementary classes in the Lahore district, Pakistan. Descriptive statistics, correlation, and regression analysis were applied for data analysis. The results show that in elementary schools, the academic performance of students was significantly associated with sports facilities on school premises.

Milambo, M. & Titus, O. (2021) conducted a study on the influence of sports and games on enhancing students' academic performance in public secondary schools in Nyamagama district, Tanzania. The findings revealed that students' participation in sports and games has a positive impact on their academic performance.

Singh (2017) conducted a study on the effect of co-curricular activities on the academic achievement of students and concluded that in wholesome the overall effect of co-curricular activities on the student's academic performance and personality development is positive, and it compliments the academic activities in the attainment of education's main goal of bringing change in student's behavior.

In a study on the correlation between co-curricular activities and academic achievements of students in Punjab, Lahore Pakistan, Ayesha, B. & Saghir, A. (2020) revealed a moderate positive relationship between participation in co-curricular activities and academic achievement of students. It was concluded that co-curricular activities play a major role in the academic achievement of students.

According to a 2014 study by Isaac Njugua Kimengi et al. on students' co-curricular activity and academic achievement in Kenyan secondary schools, there is no meaningful correlation between co-curricular participation and academic performance. All the studies were done outside the researcher's study area which is why the researcher had to go out in the field to validate these findings or not.

Seaton et al. (1965) and Helms and Turner (1992), who both emphasize the importance of sports, say that exerting physical effort is one of the best ways to cope with emotional stress. Across all ages and both sexes, exercise is linked to lower levels of anxiety, depression, stress indices, and positive emotional impacts (Hinzen, 2014). According to Sigmund Freud, play helps children deal with their inner tensions and anxieties or get rid of them (Mohan, 1992). According to Rhodes and Tracy (1974), the play offers appropriate avenues for cathartic release and acts as a vehicle for the child to externalize his issues and express them to others. According to psychologist Erik Erickson, play is one of the main ways the ego develops. As a result, via play, a kid can go on to new developmental stages and deal with experiences that they try to replicate or negate to master or master them. The youngster makes up for disappointments and setbacks in the actual world in the play (Faw & Belkin, 2016). Sports are also intended to be enjoyable.

Children prefer to seek out enjoyable experiences rather than painful ones, according to Sigmund Freud's theory of motivation (Mohan, 1992).

Quintillian, the renowned Greek orator and rhetorician of the first century, observes that play reveals children's bent and moral character, while Johann Heinrich Pestalozzi, an educationist, believes that the goal of the physical process of education is essentially moral - to develop perseverance, courage, and self-control (Rusk & Scotland, 1979). According to Clarke (1977), participation in sports ought to progressively promote self-control and a sense of order. Sports and recreational activities are viewed as effective ways to fill free time in Kenya in a socially acceptable way and as a way to cut down on time spent using drugs or alcohol, committing crimes, or indulging in other anti-social activities (Republic of Kenya, 1998). Play helps kids maintain better discipline by educating them about the importance and meaning of structure, rules, and order (Helms and Turner, 1976).

In comparison to non-athletes, athletes have superior personalities, claim Weinberg and Gould (2015). According to their research, those who participate in team sports show less abstract reasoning, more extroversion, more dependency, and less ego strength than non-athletes, whereas those who participate in individual sports show higher levels of objectivity, more dependency, less anxiety, and less abstract reasoning than non-athletes. However, according to other studies, athletes are less worried, more autonomous, and more objective than non-athletes (Cox, 1998).

Play prepares children for abilities they will use later in life. Play helps to prepare the mind and body for later life, according to the Pre-Exercise Theory of Play (Helms and Turner, 1992). They noticed that kids practice language through play, which helps them learn it. This supports Krogh's (2014) claim that play is the foundation for excellent verbal development and that it is

linked to the environment's richness. According to Loefflet et al. (2008), girls who played ice hockey had the highest likelihood of remaining in school and avoiding dropouts. Additionally, he mentioned that at the upper secondary and post-secondary levels, students who engaged in elite ice hockey performances received financial aid in the form of scholarships. On the one hand, there is a relationship between average health, adjustment, and exceptional academic achievement, according to Arnold (1968), and on the other, there is a relationship between low organic fitness and low academic achievement, even when the potential ability is above average.

Sports are explicitly incorporated in the Ugandan curriculum through a topic called Physical Education, which is allotted one and a half times in the upper secondary part and one and a half periods in the lower secondary section. Less formally, a games department and a games instructor are anticipated in every school. Different school stakeholders approach sports in two distinct ways (Bitamazire, 2011). The first viewpoint emphasizes that schools should put their primary attention on the transfer of formal education and emphasize the pursuit of academic excellence. Sports are enjoyable, but they are not a significant part of schooling for this reason. The opposing viewpoint contends that sports-related personal development experiences are an essential component of schooling. Thus, while the latter contends that it is significant as a component of the school curriculum, the former maintains that student participation in sports interferes with academic programs in schools. Students who participated in sports outperformed their non-athlete peers in academic performance, according to a study conducted in Maryland, USA at Patapsco High School, and Centre for the Arts (Weinberg & Gould, 2015). This was attributed to student-athletes' high discipline, dedication, and physical fitness levels. The survey also showed that the facility had excellent sports facilities that enhanced access to sporting events, a quality that is severely lacking in many Ugandan secondary schools.

2.5 Summary of Literature Review

Direct infrastructure utilization and students' academic performance

Direct infrastructure utilization of classrooms, libraries, and laboratories among others is pivotal for learning and therefore academic performance. Numerous types of literature have been reviewed in this regard, including Ana et al. (2015), Kennedy et al. (2020), Farooq (2021), Philothere et al. (2020), Bala et al. (2020), Ngozi (2020), Will et al. (2020), Jinnan et al. (2018), and Kanyoy (2019), all of which showed a strong positive correlation between the availability of these facilities and students' academic performance. However, all of the research was conducted outside of the Zombo District in the West Nile Sub-region of Uganda, which is why the researcher wanted to do this specific study to either confirm or refute the results of the previous studies.

Indirect infrastructure utilization and students' academic performance

Indirect infrastructure utilization in the context of this research refers to sanitation blocks, dining halls, dormitories, staff houses, and access to clean water among others. Various types of literature have been examined in this regard; for instance, Marton and Booth (2007), Beer (2005), Watson (2003), Gogo (2002), White and Kinder (2003), Amadi, E, and Chinyere, R, (2019), Yakubu (2017), Abbas. (2021), and Nabaseruka (2010), among others, found a significant correlation between academic achievement and the availability of boarding facilities. However, where this research was done was different from the current study area that's why the researcher had to carry out this research in Zombo District

Co-curricular infrastructure utilization and students' academic performance.

In this sense, co-curricular infrastructure utilization comprises, among other things, playing fields, music rooms, and theatre rooms. Reviewing many works on co-curricular activities revealed some conclusive links between the availability of these resources and academic achievement, including those by Nganga (2003), Stephens and Schabem (2002), Broh (2012), Strong 2005, and Uti (2016), Dacosta Anaman et al (2022), Doreen (2020), Nasir et al. (2018), Othoo, H. O, & Omondi, K. (2022), Rabia et al. (2020), Milambo, M. & Titus, O. (2021), Ayesha, B. & Saghir, A. (2020), Singh (2017), among others. These studies although all agreed to the fact that the provision of co-curricular infrastructure and their usage leads to academic achievement, were done outside the researcher's study area that's why the researcher would wish to carry out this research in Zombo District.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The methodology that was employed to conduct the study is presented in this chapter. It includes the research design, study population, sample size, sampling procedures, and instruments, as well as the validity and reliability, data management and analysis, measurement of variables, and ethical considerations. It also includes the pretesting of the instruments and the protocol for data collection.

3.2 Research design

Cross-sectional survey methodology including both qualitative and quantitative methodologies were used in the study. Mann, (2003). This was mainly employed because it makes it easier to choose a small sample of people from a larger population to serve as an inference, and because surveys are made to give an overview of the state of the world at a particular moment, it permitted the inclusion of many variables at the time (Levin, 2007). As advised by Fowler (1993), survey methodology was used in this study to measure variables and examine connections between factors. Cross-sectional studies offer a clear snapshot of the outcome and characteristics connected with such a study at a certain point in time when they are conducted, according to Hall, John (2008).

3.3 Study population

This study's population consisted of Headteachers, Directors of Studies, and students, and it was based on how the school infrastructure was used and how well the students were performing academically in a sample of public secondary schools in the Zombo District of Uganda. Thus, it was determined that 224 people made up the population from which the sample was drawn. This information was gathered from the seven public secondary schools in the Zombo District.

3.4 Sample Size and Selection

Using the Krejcie & Morgan sample size table, the following sample size in Table 1 will be used.

Table 3: Sample size and techniques for data collection

Categories	Target population	Sample size	Sampling Technique	Data Collection Method
Headteachers	**07**	**07**	**Purposive Sampling**	**Interview**
Director of Studies	**07**	**07**	**Purposive Sampling**	**Interview**
Students	**210**	**136**	**Simple Random Sampling**	**Questionnaire**
Total	**224**	**150**		

Source: Education office Zombo District (2022) and guided by Krejcie and Morgan (1970) Sampling Method as cited by Amin (2005).

3.5 Sampling Techniques and Procedure

Both probability and non-probability sampling methods were used in the combination of sampling approaches. With probability sampling approaches, respondents were randomly chosen from the population, whereas with non-probability sampling techniques, participants were specifically chosen. Both the probability sampling approach and the non-probability sampling technique used basic random sampling. Due to their large number, a straightforward random selection procedure was utilized to choose the students, ensuring that every student in every school had an equal

opportunity to take part in the study and preventing bias. It also reduced the amount of time and money that had to be spent. The Headteachers and Directors of Studies were chosen through the use of purposeful sampling since it was anticipated that they would have greater in-depth knowledge of how the school infrastructure was used and how well the students were performing academically.

3.6 Data Collection Methods

3.6.1 Questionnaire survey

A survey employing standardized questionnaires was conducted to gather data from a chosen group of students (Amin, 2005). This strategy entailed gathering information from a sample of pupils systematically. For this group of respondents, whose number was too great to interview, a questionnaire survey was employed to save time.

3.6.2 Interview

According to Mugenda and Mugenda (1999), structured interviews were utilized to gather information from headteachers and directors of studies because they allowed the researcher to build a connection with them, secure their participation, and provide informative data. In addition, they were small but the most educated about how their particular schools used their educational infrastructure and how well their pupils performed academically. In-depth information was also obtained by probing and clarification of unclear responses during structured interviews. To gather information for the study, structured interviews were created.

3.7 Data Collection Instruments

As described in the following subsection, two different types of data collection devices were employed in the study: questionnaires and interview guides.

3.7.1 Questionnaires

Students' quantitative responses to self-administered questionnaires (SAQs) were gathered. According to Mugenda and Mugenda (1999), SAQs were employed for this group of respondents because it would take too long to interview them all and because they could read and write English well enough to complete the questions on their own without help.

3.7.2 Interview guide

By probing Headteachers and Directors of Studies who were able to provide in-depth information about their schools during the interview (DiCicco-Bloom & Crabtree, 2006; cited in Picho, 2017), a qualitative data set was gathered (Amin, 2005). To get a more in-depth explanation of the problem at hand from the respondents, a lot of the time in this study was spent using the probing interviewing technique. This was mostly because the respondents needed to be encouraged to elaborate on or better clarify their responses and ideas so that a wider comprehension of the study's findings could be more readily attained. The interviews were given questions by the researcher, and their opinions were recorded. The information gathered through interviews was added to the information gathered through questionnaires.

3.8 Validity and Reliability of Instruments

3.8.1 Validity

To establish construct, content, and face validity, the instruments were provided to two experts knowledgeable about the subject field who commented on the ambiguity and relevance of the items. The following equation was applied to determine the content validity index (CVI):

$$CVI = \frac{\text{Number of items declared valid}}{\text{All the items in the questionnaires}}$$

Table 4: Validity of the questionnaire

Raters	Items rated relevant	Items rated no relevant	Total
Rater 1	26	4	30
Rater 2	24	6	30
Total	50	10	60

Thus, applying the formula, $CVI = \frac{50}{60} \approx .8333$

According to Professor Amin (Amin, 2005), a research tool is valid if the score is from 0.7 to 0.9 and therefore, this research tool was valid because the score was within the range.

3.8.2 Reliability

They were pilot-tested on comparable respondents in secondary schools that were not chosen to participate in the study. The results were subjected to Cronbach alpha reliability, and the data collected from the pilot test was analyzed using Statistical Package for Social Sciences (SPSS). This was done to ensure the extent to which questionnaires produced consistent results when used under the same conditions. A table was used to present the results.

Table 5: Reliability of the questionnaire

Variables	Cronbach's Alpha	Number of items
Reliability for direct infrastructure	.846	10
Reliability for indirect infrastructure	.810	10
Reliability for co-curricular infrastructure	.740	10
Reliability for students' academic performance	.759	10

According to Nunnally, who is mentioned in Picho (2017), the Cronbach alpha coefficients for the variables in the questionnaire were higher than 0.7, which is advised. As a result, the questionnaire was deemed trustworthy for gathering data.

3.9 Procedure of Data Collection

The authorities received a letter of authorization from Muni University; The researcher went to the schools and requested permission from the Headteachers to gather data from the directors of studies pupils. The researcher also requested permission from his Headteacher (Pakadha Seed Secondary School). The data was then examined by the researcher.

3.10 Data Analysis

3.10.1 Quantitative data analysis

Frequencies and percentages as well as inferential statistics like Pearson Product Moment Correlation, Regression, and ANOVA were the major components of quantitative data analysis. The respondents' opinions on the use of the school's infrastructure and students' academic performance were ascertained using frequencies and percentages. To test the hypotheses, Pearson product-moment correlation was used. The strength of the association between the variables was assessed using the correlation coefficient (r). The nature of the association was determined by the sign of the correlation coefficient (+ or -). The reliability of the results was assessed using the

significance of the correlation coefficient (p). The linear link between the variables was identified by the regression coefficient (R). To calculate the percentage of variance in the dependent variable that may be attributed to the independent variables, this was squared and corrected. To identify the aspects of the use of the school infrastructure that had the biggest impact on students' academic achievement, an ANOVA was computed.

3.10.2 Qualitative data analysis

To modify qualitative data and reassemble it into more concise, comprehensible words, content analysis was applied. The analysis of qualitative data in which themes, categories, and patterns were found employed a thematic method. In the results, the recurring themes that arose in response to each of the interview's leading questions were given, with a few direct quotes from participants serving as examples.

3.11 Measurement of variables

The questionnaire was accompanied by an ordinal measurement, which categorized and ranked the variables. Thus, a Likert scale was used to collect opinion data on the study variables using the five scales: 5 = strongly agree; 4 =agree; 3 =Not sure; 2 =disagree; 1 =strongly disagree.

3.12 Ethical Consideration

The Oxford Advanced Learners' Dictionary (8^{th} Edition) describes the word ethical as something morally correct or acceptable. Johnson, (2008) as cited in Kanyoi, 2019 proposes that Ethics are the principles and guidelines that aid us to uphold the things we value. To answer the problems of what is right or wrong in human affairs, ethics is a collection of values and principles. It looks for

justifications for behaving or not acting; for approving or not approving conduct; for affirming or rejecting a claim regarding righteous or impious behavior, or norms of good or evil (Australian Law Reform Commission and Austrian Health Ethics Committee, 2001), as referenced in Picho, 2017. For researchers, ethics is an essential consideration and ethical clearance was given by Muni University allowing the researcher to carry out the study. Additionally, the researcher asked his headteacher for permission to gather data from the chosen public secondary schools in the Zombo district. The researcher also asked the Headteachers of the chosen public secondary schools for permission to conduct the study in their institutions.

The value of research relies as much on its ethical veracity as on the novelty of its discoveries (William, 2011) as cited in Kanyoi, 2019. Permission from the participants was sought; All participants were asked to either consent in writing or complete an ascent form. Additionally, participants had the option to withdraw their consent whenever they felt uncomfortable. No identifying information was included in the questionnaire; therefore, all data and personal information were kept private. Any questions that the participants did not feel comfortable answering were completely up to them. Participants' privacy and wishes were respected.

CHAPTER FOUR

PRESENTATION, ANALYSIS, AND INTERPRETATION OF FINDINGS

4.1 Introduction

In this chapter, the results are given, looked at, and understood. It is divided into seven smaller pieces. In the first subsection, the response rate results are shown. In the second sub-section, findings related to respondents' demographic characteristics are reported. In the third sub-section, findings addressing the direct relationship between infrastructure use and academic achievement are reported for a few chosen public secondary schools in the Zombo district of Uganda. The impact of indirect infrastructure use on pupils' academic achievement in a few selected secondary schools in Uganda's Zombo area is shown in the fourth sub-section. Results for a few selected public secondary schools in the Zombo area of Uganda regarding the influence of co-curricular infrastructure utilization on students' academic achievement are displayed in the fifth sub-region. Results for the dependent variable are presented in the sixth subsection. Results for all independent factors combined on the dependent variable are shown in the seventh sub-section.

4.2 Response Rate

The response rate, also known as the completion rate, in survey research is the proportion of the sample population that responded to the survey out of the entire population (Johnson & Owens, 2003). If the non-response is unequal across the participants considering exposure and/or outcome, a low response rate may result in sampling bias. The sample size for this study was 224 respondents, and 98.2% of them responded, well exceeding the suggested 67%. Table 6 below shows the breakdown.

Table 6: Response Rate

Category of population	Sampled size	Response Rate	Percentage (%)
Headteachers	07	05	71.4
Director of Studies	07	05	71.4
Students	210	210	100
Total	**224**	**220**	**98.2**

Source: Data from the field

When compared to the recommended 67% response rate (Amin, 2005; Mugenda & Mugenda, 1999), Table 6's response rate was 98.2%, which is much higher. As a result, the outcomes were regarded as being indicative of what the 224 target participants would have revealed.

4.3 Demographic characteristics

Tables 7, 8, 9, and 10 present the respondents' responses to questions about gender, age, class, and length of time spent in their schools, which the researcher used to enlighten and explain certain phenomena. Results on respondents' gender groups are specifically shown in Table 7.

Table 7: Gender of respondents

Gender of Respondents	Frequency	Percentage (%)
Male	113	53.8
Female	97	46.2
Sub-total	**210**	**100.0**

Source: Data from the field

According to Table 7, more respondents (53.8%) were men. However, a sizable proportion of women (46.2%) also took part in the survey. This indicates that the study's conclusions benefited greatly from the perspectives of both sexes.

Table 8: Age of respondents

Age	Frequency	Percentage
12 – 15 years	21	10.0
16 – 18 years	90	42.9
19 – 21years	77	36.7
21 years and above	22	10.4
Total	**210**	**100.0**

Source: Data from the field

According to Table 8, a larger percentage of respondents (42.9%) fell into the 16–18 age range. Other age groups, such as those between the ages of 12 and 15, 19 to 21, and over 21, also took part in the survey (10.4%, 36.7%, and 10.4%, respectively). This indicates that all age groups made a major contribution to the study's conclusions.

Table 9: Length of Stay of Respondents

Length of stay of respondents	Frequency	Percentage
Less than a year	73	34.7
1 – 3 years	60	28.6
4- 5 years	64	30.5
More than 5 years	13	6.2
Total	**210**	**100.0**

Source: Data from the field

According to Table 9, a sizable portion of respondents (34.7%) had attended their respective schools for no more than a year. But the majority (65.3%) had remained for longer than a year. This indicated that the majority of people were the most reliable information sources because they were in control of and sufficiently knowledgeable about what occurred with the utilization of school facilities and kids' academic performance in their schools.

Table 10: Class of respondents

Class	Frequency	Percentage
S1	42	20.0
S2	17	8.0
S3	35	16.7
S4	64	30.5
S5	31	14.8
S6	21	10.0
Total	**210**	**100.0**

Source: Data from the field

There were more respondents in the S4 class, as shown in Table 10, but there were also respondents in the S1 (20.0%), S2 (8.0%), S3 (16.7%), S5 (14.8%), and S6 (10.0%) classes, suggesting that the opinions of all the classes considerably influenced the study's conclusions.

Effect of direct infrastructure on students' academic performance in selected public secondary schools in the Zombo district of Uganda

To establish any correlation between the direct use of infrastructure (classrooms, labs, libraries, and computer labs) and students' academic performance, it was prudent to first learn the results on each of the variables independently using descriptive statistics, which in the study were frequencies and percentages given that the type of data was ordinal. As a result, the findings about direct infrastructure use and students' academic achievement are presented in the following subsections.

4.3.1 Descriptive results on direct infrastructure utilization

Students responded to eight questions about the usage of direct infrastructure on a five-point Likert scale by checking the boxes next to the statements they agreed with. The results are displayed in Table 11. The items are displayed in the first column, and columns 2 through 6 display the frequency and percentage of students' responses to each of the items. The frequency and percentage

of students who answered each question correctly are shown in the final column. Strongly Disagree, Disagree, Not Sure, Agree, and Strongly Agree are represented by the letters on the keys. strongly agree. Following the presentation of results in Table 11, the analysis and interpretation of the findings on direct infrastructure utilization are provided.

Table 11: Descriptive results on direct infrastructure utilization

Direct infrastructure utilization	SD	D	NS	A	SA	TOTAL
Classrooms are adequate in this school	62 (29.5%)	72 (34.3%)	9 (4.3%)	26 (12.4%)	41 (19.5%)	210 (100.0%)
Classrooms have adequate ventilation	39 (18.6%)	44 (21.0%)	5 (2.4%)	66 (31.4%)	56 (26.7%)	210 (100.0%)
The school has a laboratory for Chemistry which is well-stocked and used by learners	41 (19.5%)	32 (15.2%)	15 (7.1%)	57 (27.1%)	65 (31.0%)	210 (100.0%)
The school has a laboratory for Physics which is well-stocked and used by learners	48 (22.9%)	26 (12.4%)	25 (11.9%)	59 (28.1%)	52 (24.8%)	210 (100.0%)
The school has a laboratory for Biology which is well-stocked and used by learners	56 (26.7%)	29 (13.8%)	15 (7.1%)	52 (24.8%)	58 (27.6%)	100 (100.0%)
The school has a library that is well-stocked with relevant textbooks	63 (30.0%)	42 (20.0%)	18 (8.6%)	44 (21.0%)	43 (20.5%)	210 (100.0%)
Because there aren't enough classrooms, optional subjects are taught in laboratories.	78 (37.1%)	37 (17.6%)	11 (5.2%)	41 (19.5%)	43 (20.5%)	210 (100.0%)
The school has a computer laboratory with enough computers	104 (49.5%)	46 (21.9%)	12 (5.7%)	30 (14.3%)	18 (8.6%)	210 (100.0%)

Source: Data from the field

In this study, "strongly disagreed" and "disagreed" were merged to mean "disagreed," while "strongly agreed" and "agreed" were combined to imply "agreed." This was done for the sake of clarity in the analysis. According to Table 4.3.1, 134 respondents, or 63.8%, disagreed with the statement, compared to 67 respondents, or 31.9%, who agreed, and 9 respondents, or 4.3%, who

were unsure. According to Table 4.3.2, 122 respondents (58.1%) agreed with the statement, 83 respondents (39.6%) disagreed, and 5 respondents (2.4%) were unsure. According to Table 4.3.3, 73 (34.7% of the respondents) agreed with the statement, whereas 122 (58.1%) of respondents disagreed, and 15 (7.1%) of the respondents were unsure. For items 2, 3, 4, and 5, more students generally agreed with the statements; the percentage of respondents who agreed with the statement ranged from 52.4 to 58.1; the percentage of respondents who disagreed with the statement ranged from 34.7 to 40.5; and the percentage of those who were unsure ranged from 7.1 to 11.9. More respondents disagreed with the claims than agreed or were unsure about items 1, 6, 7, and 8. The responders who disagreed, as a percentage, ranged from 50.0 to 71.4. Between 22.9 and 41.5 percent of respondents agreed with the claims, whereas between 5.2 and 8.6 percent of respondents were unsure.

The interpretation is as follows from this analysis. According to the findings, the majority of students felt that their Ugandan schools in the Zombo region lacked adequate classroom space, which harmed the students' academic performance. In addition, most students were of the view that their classrooms had adequate ventilation in the schools in the Zombo district of Uganda, thus not affecting students' academic performance. Most students were of the view that their schools had laboratories for chemistry, physics, and biology, thus positively affecting students' academic performance. While the majority of students believed that their schools lacked libraries that were fully stocked with pertinent textbooks and frequently used by students, negatively affecting students' academic performance, laboratories were not used for optional subjects due to subpar classrooms and lacked computer labs with enough computers.

The effectiveness of direct infrastructure utilization on students' academic achievement in a few selected public secondary schools in the Zombo district of Uganda, according to interview findings *"Most school administrators revealed that their schools had the inadequate direct infrastructure, thus negatively affecting students' academic performance (interview with director of studies of school A,27 April 2023)".*

4.3.2 Inferential statistical results on direct infrastructure utilization and students' academic performance

The first claim was put to the test: "There is a significant effect of direct infrastructure utilization on the academic performance of students in selected public secondary schools in the Zombo district of Uganda."

Table 12: Correlation co-efficient on Direct Infrastructure

	Direct Infrastructure	
Academic performance	r	.503
	r^2	.253
	p	.000
	N	210

Source: Data from the field

Table 12's findings demonstrate a moderately favorable association (r =.503) between students' academic achievement in a sample of Uganda's public secondary schools and the use of direct infrastructure. The square of the correlation coefficient, or the coefficient of determination (r^2=.253), was calculated and expressed as a percentage to estimate the variation in students' academic performance attributable to direct infrastructure utilization because the correlation does suggest a causal relationship, as stated in the first objective. Findings indicate that a 25.3% difference in students' academic achievement was directly attributable to the use of the

infrastructure. These findings were subjected to a test of significance (p) and it is shown that the significance of the correlation (p = .000) was statistically significant at 1%. Because of this, the hypothesis *"There is a significant effect of direct infrastructure utilization on the academic performance of students in selected public secondary schools in Zombo district of Uganda'' was* ***accepted***.

Table 13: Multiple regression for direct infrastructure utilization model.

	Model 1	Model 2
Variables	**Coefficient (P-Value)**	**Coefficient (P-Value)**
Direct infrastructure utilization	0.303 (0.000)	0.294 (0.000)
Age of students		0.389 (0.410)
Length of stay of students		0.520 (0.182)
Class of students		-0.183 (0.463)
Constant	8.091 (0.000)	6.868(0.000)

Source: Empirical Data- 2023

Model 1: Simple Regression of direct infrastructure utilization model.

Model 2: Multiple regression of direct infrastructure utilization model.

Findings in Table 13 reveal the p-values for model 1, and model 2 were statically significant for direct infrastructure utilization because their p-values were statistically significant at 1%. A unit increase in direct infrastructure utilization leads to an improvement in students' academic performance by 30.3%, and 29.4% for models 1, and 2 respectively. Compounding variables (age of students, length of stay in school of students, and class of students) were statistically insignificant. The compounding variables reduced the coefficient value of direct infrastructure utilization by 0.009.

4.4 Indirect infrastructure utilization and students' academic performance in the Zombo district of Uganda

Descriptive statistics for indirect infrastructure utilization are presented to show the respondents' perspectives on this variable before determining the effects of indirect infrastructure utilization (washrooms, dormitories, dining halls, sick bays, staff houses, and clean sources of drinking water) on students' academic performance. The next subsections contain a presentation of the findings.

4.4.1 Descriptive results on indirect infrastructure utilization

Table 14 asked students to reply to 8 questions about indirect infrastructure utilization by checking the boxes next to the statements they agreed with on a five-point Likert scale. The keys were used to access the infrastructure directly. The presentation of findings in Table 13 is followed by the analysis and interpretation of the findings on indirect infrastructure utilization.

Table 14: Descriptive results on indirect infrastructure utilization

Indirect infrastructure utilization	SD	D	NS	A	SA	TOTAL
The school has adequate washrooms for boys	108 (51.4%)	52 (24.8%)	20 (9.5%)	19 (9.0%)	11 (5.2%)	210 (100.0%)
The school has adequate washrooms for girls	64 (30.5%)	56 (26.7%)	19 (9.0%)	32 (15.2%)	39 (18.6%)	210 (100.0%)
The school has spacious dormitories for boys	116 (55.2%)	41 (19.5%)	18 (8.6%)	22 (10.5%)	13 (6.2%)	210 (100.0%)
The school has spacious dormitories for girls	60 (28.6%)	38 (18.1%)	15 (7.1%)	37 (17.6%)	60 (28.6%)	210 (100.0%)
There is a dining hall in the school	154 (73.3%)	25 (11.9%)	4 (1.9%)	4 (1.9%)	23 (11.0%)	210 (100.0%)
The school has a sick bay	132 (62.9%)	34 (16.2%)	12 (5.7%)	9 (4.3%)	23 (11.0%)	210 (100.0%)
The school has staff houses for all the teachers/ support staff	88 (41.9%)	33 (15.7%)	10 (4.8%)	47 (22.4%)	32 (15.2%)	210 (100.0%)
There is a clean source of drinking water within the school	66 (31.4%)	25 (11.9%)	8 (3.8%)	59 (28.1%)	52 (24.8%)	210 (100.0%)

Source: Data from the field

Findings in Table 14 show that more students disagreed with items 1-7 about indirect infrastructure utilization than those who agreed. Most students agreed with item 8 about indirect infrastructure utilization 111(52.9%) those who disagreed 91(43.3%) and those who were not sure 8(3.8%). From these comparisons, it can be seen that the percentages of those who disagreed on items 1-7 were higher than those who agreed and were not sure. Those who disagreed ranged from 98(46.7%) to 179(85.2%), while those who were not sure ranged from 4(1.9%) to 20(9.5%) and those who agreed ranged from 23(12.9%) to 97(46.2%.Most students were of the view that washrooms for both boys and girls were inadequate, dormitories for boys and girls were not spacious, there were no dining halls in their schools, sick bays were not in place, and their schools did not have staff houses for all the teachers and support staff, thus negatively affected students' academic performance. Those who agreed with item 8 of indirect infrastructure utilization were of the view that their schools had clean sources of drinking water within their schools, thus, affecting students' academic performance positively.

More information on the impact of direct infrastructure utilization on students' academic achievement in selected public secondary schools in the Zombo area of Uganda may be found in interview findings from headteachers and the director of studies. Interviews with school administrators revealed inadequate indirect infrastructure in their schools that negatively affected students' academic performance.

"Only one school out of the seven schools under study had adequate indirect infrastructure for both boys and girls, all the schools had inadequate washrooms, and their dormitories were congested (interview with administrator of school B, 4th May 2023)''.

4.5.1 Inferential statistical results on indirect infrastructure utilization and Students' academic performance

"Indirect infrastructure utilization significantly influences students' academic performance in selected public secondary schools in the Zombo district of Uganda," is the second hypothesis. was examined.

Table 15: Correlation co-efficient on Indirect Infrastructure

	Indirect Infrastructure	
Academic performance	r	.475
	r^2	.226
	p	.000
	N	210

Source: Data from the field

Findings in Table 15 show that there was a moderate positive correlation (r =.475) between indirect infrastructure utilization and students' academic performance in selected public secondary schools in the Zombo district of Uganda. The indirect usage of infrastructure, as measured by the coefficient of determination (r^2 =.226), was in charge of 22.6% of the difference in students' academic performance. The correlation's significance (p =.000) was statistically significant at 1%. This was discovered after these data were subjected to a test of significance (p). Because of this, the hypothesis *"Indirect infrastructure utilization significantly affects students' academic performance in selected public secondary schools in the Zombo district of Uganda'', was* ***accepted***.

Table 16: Multiple regression of indirect infrastructure utilization model

	Model 1	Model 2
Variables	**Coefficient (P-Value)**	**Coefficient (P-Value)**
Indirect infrastructure utilization	0.356 (0.000)	0.355 (0.000)
Age of students		0.696 (0.141)
Length of stay in the school of students		0.752 (0.055)
Class of students		-0.369 (0.141)
Constant	9.396 (0.000)	7.386 (0.000)

Source: Empirical Data- 2023

Model 1: Simple Regression of indirect infrastructure utilization model.

Model 2: Multiple regression of indirect infrastructure utilization model.

Findings in Table 16 reveal the p-values were statically significant for the dimension of indirect infrastructure utilization and length of stay in the school of students because their p-values were statistically significant at 1%, and 10% respectively. A unit increase in indirect infrastructure utilization, and stay in the school, leads to improvement in students' academic performance by 35.6%, 35.5% for indirect infrastructure utilization, and 75.2% for length of stay in the school of students respectively. The age of students and a class of students were statistically insignificant. The compounding variables reduced the coefficient value of indirect infrastructure utilization by 0.001

4.5 Co-curricular infrastructure utilization and Students' academic performance in selected public secondary schools in the Zombo district of Uganda

Descriptive statistics for co-curricular infrastructure utilization are presented to show the respondents' perspectives on this variable before determining the effects of co-curricular infrastructure utilization (playgrounds, music/theatre rooms, worship rooms, entertainment halls,

and rooms for indoor games) on students' academic performance. The next subsections contain a presentation of the findings.

4.5.1 Descriptive Results on co-curricular infrastructure utilization

A five-point Likert scale was used to ask students to react to five questions about co-curricular infrastructure in Table 16. Both direct and indirect infrastructure utilization used the same keys. Following the presentations in Table 15 is the analysis and interpretation of the findings regarding the use of co-curricular infrastructure.

Table 17: Descriptive results on co-curricular infrastructure utilization

Co-curricular infrastructure	SD	D	NS	A	SA	TOTAL
The school has a playground for both boys and girls	119 (56.7%)	35 (16.7%)	8 (3.8%)	25 (11.9%)	23 (11.0%)	210 (100.0%)
There is a music/ theatre room in the school	146 (69.5%)	37 (17.6%)	10 (4.8%)	9 (4.3%)	8 (3.8%)	210 (100.0%)
The school has worship rooms for the known denominations	115 (54.8%)	43 (20.5%)	11 (5.2%)	22 (10.5%)	19 (9.0%)	210 (100.0%)
There is an entertainment hall in the school	128 (61.0%)	30 (14.3%)	8 (3.8%)	19 (9.0%)	25 (11.9%)	210 (100.0%)
The school has room for indoor games	141 (67.1%)	38 (18.1%)	13 (6.2%)	12 (5.7%)	6 (2.9%)	210 (100.0%)

Source: Data from the field

Table 17's findings reveal that more students disagreed than agreed or were unsure about the usage of co-curricular infrastructure for items 1 through 5. Comparing responses to items 1 through 5 reveals that the percentage of people who disagreed ranged from 158 (75.3%) to 183 (87.1%), those who agreed from 17 (8.1%) to 44 (20.9%), and those who were unsure from 8 (3.8%) to 13 (6.2%). The percentages of those who disagreed with items 1 through 5 were larger than those who agreed but were unsure based on these comparisons. Most students were of the view that most schools lack playgrounds for both boys and girls, no music or theatre rooms, worship rooms for

the known denominations are lacking, lack entertainment halls, and rooms for indoor games, thus negatively affecting students' academic performance.

The results of interviews provide more insight into the effect of co-curricular infrastructure on students' academic achievement at a few selected public secondary schools in Uganda's Zombo area. Interviews with school administrators revealed that co-curricular infrastructure was inadequate and thus negatively affected students' academic performance.

"Only one school out of seven schools under study had playgrounds for both boys and girls, rooms for indoor games, music or theatre rooms were lacking, thus affecting students' performance in co-curricular activities and their overall students' academic performance negatively (interview with the headteacher of school C 5th May 2023)".

4.5.2 Inferential Statistical Results on co-curricular Infrastructure Utilization and Students' Academic Performance

The third claim, "Co-curricular infrastructure utilization has a significant impact on students' academic performance in selected public secondary schools in the Zombo district of Uganda," was put to the test.

Table 18: Correlation co-efficient on Co-curricular Infrastructure

	Co-curricular Infrastructure	
Academic performance	r	.382
	r^2	.146
	p	.000
	N	210

Source: Data from the field

Results from Table 18 demonstrate a weakly positive connection (r = 0.382) between students' academic achievement in a sample of public secondary schools in the Zombo area of Uganda and

the use of co-curricular infrastructure. The use of co-curricular infrastructure was found to be responsible for 14.6% of the variation in students' academic performance, according to the coefficient of determination (r^2 =.146). The correlation's significance (p =.000) was statistically significant at 1%. This was discovered after these data were subjected to a test of significance (p). Consequently, the premise *"There is a significant effect of co-curricular infrastructure utilization on students' academic performance in selected public secondary schools in Zombo district of Uganda'' was* ***accepted***.

Table 19: Multiple regression of co-curricular infrastructure utilization model

	Model 1	Model 2
Variables	**Coefficient (P-Value)**	**Coefficient (P-Value)**
Co-curricular infrastructure utilization	0.436 (0.000)	0.455 (0.000)
Age of students		0.810 (0.102)
Length of stay in the school of students		0.783 (0.057)
Class of students		-0.562 (0.035)
Constant	8.091 (0.000)	9.269 (0.000)

Source: Empirical Data- 2023

Model 1: Simple Regression of Co-curricular infrastructure utilization model.

Model 2: Multiple regression of the Co-curricular infrastructure utilization model.

Findings in Table 19 reveal the p-values were statically significant for co-curricular infrastructure utilization, and compounding variables of length of stay in the school, and class of students because their p-values were statistically significant at 1%, and 10% respectively. A unit increase in co-curricular infrastructure utilization, stay in the school, and class, leads to an improvement in students' academic performance by 43.6%, 45.5% in models 1, and 2 respectively for co-curricular infrastructure utilization, 78.3% for the length of stay in the school, and decreases by 56.2% for the class of students. The age of students was statistically insignificant. The compounding variables increased the coefficient value of co-curricular infrastructure utilization by 0.019.

4.6 Students' Academic Performance

To understand the indicators of students' academic performance (good grades and development of skills/talents), students were asked to respond to 5 items about students' academic performance by indicating their agreement using a five-point Likert scale in Table 20. The keys used were for direct infrastructure, indirect infrastructure, and co-curricular infrastructure. The analysis and interpretation of the findings about students' academic performance follow the presentations of the findings in Table 20.

Table 20: Descriptive results on students' academic performance

Students' academic performance	SD	D	NS	A	SA	TOTAL
Students have computer knowledge/ skills	61 (29.0%)	34 (16.2%)	31 (14.8%)	43 (20.5%)	41 (19.5%)	210 (100.0%)
Performance standards in terms of grade scores in the school are high	25 (11.9%)	64 (30.5%)	28 (13.3%)	73 (34.8%)	20 (9.5%)	210 (100.0%)
Students perform better in weekly tests and end-of-term exams	42 (20.0%)	43 (20.5%)	50 (23.8%)	49 (23.3%)	26 (12.4%)	210 (100.0%)
I am satisfied with the level of students' academic performance in the school	41 (19.5%)	44 (21.0%)	47 (22.4%)	53 (25.2%)	25 (11.9%)	210 (100.0%)
Students perform well in practical lessons	29 (13.8%)	24 (11.4%)	32 (15.2%)	61 (29.0%)	64 (30.5%)	210 (100.0%)

Source: Data from the field

Table 20 shows that more respondents disagreed with items 1, 3, and 4 compared to those who agreed and were not sure, more respondents agreed with items 2 and 5 than those who disagreed. A comparison of items 1,3, and 4 shows that those who disagreed ranged from 85(40.5%) to 95(45.2%), those who agreed ranged from 75(35.7%) to 84(40%), and those who were not sure ranged from 28(13.3%) to 50(23.5%). From the comparisons, it can be seen that the percentages of those that disagreed on items 1,3, and 4 were higher than those that agreed and were not sure. The percentages of those that agreed with items 2, and 5 were higher than those that disagreed and were not sure. Most students were of the view that students did not have computer skills,

performance in weekly tests and end-of-term exams was no better, and were not satisfied with the level of students' academic performance in their schools, thus there were poor students' academic

Performance. Those who agreed with items 2, and 5 were of the view that their schools had high-performance standards in terms of grade scores and that students performed well in practical lessons, thus there was high students' academic performance. Interview findings from headteachers and the director of studies shed more light on the effect of school infrastructure utilization on students' academic performance in selected public secondary schools in the Zombo district of Uganda. Interviews with school administrators revealed that most schools had inadequate school infrastructure (direct, indirect, and co-curricular infrastructure), thus negatively affecting students' academic performance.

'' Our school has inadequate direct, indirect, and co-curricular infrastructure (interview with the headteacher of school D, 5th May 2023)''. Only one school out of the seven schools under study had adequate school infrastructure (direct, indirect, and co-curricular infrastructure), thus affecting students' academic performance positively.

"Our school has adequate has the adequate direct, indirect, and co-curricular infrastructure (interview with Director of Studies of school E, 6th May 2023)"

4.7 Regression statistics

After determining how each of the independent variables affected the dependent variable, a regression analysis was conducted to establish which of the independent variables affected the dependent variable most. The findings are presented in table 21.

Table 21: Joint test of significance of infrastructure utilization on students' academic performance

Variables	Coefficient	t	Adjusted R^2	F	P-value
Constant	6.836	7.410	0.296	30.021	0.000
Direct infrastructure utilization	0.195	4.240			0.000
Indirect infrastructure utilization	0.139	2.220			0.027
Co-curricular infrastructure utilization	0.168	2.095			0.037

Source: Empirical Data- 2023

Findings in Table 21 show the Adjusted R Square (.296) shows that the dimensions of school infrastructure utilization (direct infrastructure, indirect infrastructure, and co-curricular infrastructure utilization) accounted for a 29.6% variance in students' academic performance.

The Fisher's ratio (F = 30.0) had a significant value of .000, which was statistically significant at 1%. This indicated an acceptable error in the findings in the previous paragraph and hence confidence in the findings. It was concluded that the dimensions of school infrastructure utilization (direct infrastructure, indirect infrastructure, and co-curricular infrastructure utilization) contributed to a 29.6% variance in students' academic performance. Since the 29.6% variance in students' academic performance was a combined effect of the dimensions of school infrastructure utilization(direct infrastructure, indirect infrastructure, and co-curricular infrastructure) on students' academic performance, there was a need to determine which dimension affected students' academic performance most. Table 21, shows that only one dimension of school infrastructure utilization (direct infrastructure) largely had a significant effect on students' academic performance in selected public secondary schools in the Zombo district of Uganda because they had a p-value (.000), which was statistically significant at 1%. Indirect infrastructure, and co-curricular infrastructure utilization also significantly affected less students' academic performance in the selected public secondary schools in the Zombo district of Uganda.

CHAPTER FIVE

SUMMARY, DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary, discussions, conclusions, recommendations, and areas for further study. It is divided into four sub-sections. The first sub-section presents a summary of the findings. The second sub-section presents the discussion according to the objectives of the study. The third sub-section presents the conclusions. The fourth sub-section presents the recommendations and the areas for further study.

5.2 Summary of Findings

5.2.1 Effect of Direct Infrastructure Utilization on Students' Academic performance in selected public secondary schools in Zombo District of Uganda

There was a moderate positive correlation(r=.503) between direct infrastructure utilization and students' academic performance in selected public secondary schools in the Zombo district of Uganda.

This implied that the better the direct infrastructure utilization, the better the student's academic performance in selected public secondary schools in the Zombo district of Uganda. This is an indication that any positive change in direct infrastructure leads to students' academic performance by 50.3%.

5.2.2 Effect of indirect infrastructure utilization on Students' academic performance in selected public secondary schools in the Zombo district of Uganda

There was a moderate positive correlation (r =.475) between indirect infrastructure utilization and students' academic performance in selected public secondary schools in the Zombo district of Uganda.

This implied that the better the direct infrastructure utilization, the better the student's academic performance in selected public secondary schools in the Zombo district of Uganda. This is an indication that any positive change in indirect infrastructure leads to students' academic performance by 47.5%.

5.2.3 Effect of Co-curricular Infrastructure Utilization on Students' Academic performance in Selected Public Secondary Schools in the Zombo district of Uganda

There was a slight positive correlation (r =.382) between co. curricular infrastructure and students' academic performance in selected public secondary schools in the Zombo district of Uganda. This implied that the availability of co-curricular infrastructure influences students' academic performance. This implies that any positive change in co-curricular infrastructure leads to a change in students' academic performance by 38.2%.

5.3 Discussion

5.3.1 Effect of Direct Infrastructure Utilization on Students' Academic Performance in Selected Public Secondary Schools in the Zombo District of Uganda

The study sought to establish the effect of direct infrastructure utilization on students' academic performance in selected public secondary schools in the Zombo district of Uganda. The study established a moderate positive correlation between direct infrastructure utilization and students' academic performance in selected public secondary schools in the Zombo district of Uganda. Findings revealed that the availability, and effective utilization of classrooms with adequate ventilation, science laboratories, well-stocked libraries, and computer laboratories have a moderate positive bearing on students' academic performance. Results showed that the availability and effective utilization of direct infrastructure in the selected public secondary schools in the Zombo district leads to better students' academic performance other factors constant.

The findings are in agreement with Philothere et al., (2020) who conducted a study on the determinants of school performance in selected public schools in Rwanda and concluded that the availability of physical resources such as libraries and laboratories had a positive effect on students' academic performance. The library size together with the quality of the materials in it significantly affects students' learning and academic achievement (Bello, 2018). The findings also concur with Kennedy et al., (2020) conducted a study on the influence of board of managers' infrastructural development practices and students' academic performance in public secondary schools in Nyamira County, Kenya, and concluded that inadequate provision of infrastructural facilities like classrooms, libraries, laboratories, and computer laboratories negatively affected students, academic performance. This is the same finding in a study done by Farooq, M., and

Ahmed, R., (2021) on classroom management practices and learners' academic achievement. Anang Amiruddu Nugroho and Udik Budi, (2020) observed that the state of the classroom which is part of the school building, when in good condition will support teaching and learning, students will feel comfortable, excited, and facilitated in the teaching, and learning process, hence academic performance.

5.3.2 Effect of Indirect Infrastructure Utilization on Students' Academic Performance in Selected Public Secondary Schools in Zombo District of Uganda

The study sought to investigate the effect of indirect infrastructure utilization on students' academic performance in selected public secondary schools in the Zombo district of Uganda. The study established a moderate positive correlation between indirect infrastructure utilization and students' academic performance in selected public secondary schools in the Zombo district of Uganda. Findings revealed that the availability, and effective use of washrooms, dormitories, a dining hall, a sick bay, staff houses, and a clean source of drinking water has a moderate positive bearing on students' academic performance. Results showed that the availability and effective use of indirect infrastructure in the selected public secondary schools in the Zombo district leads to better students' academic performance other factors constant.

The findings are in agreement with Beer (2005) and Watson (2003) who observed that housing teachers and students in the school compound goes a long way to improving learners' performance. Teachers who stay within the school compound can get time to help learners after class hours through remedial teaching. According to Gogo (2002), materials used in the construction of school buildings and the type of buildings determine the levels of cleanliness. When cleanliness in schools

is maintained, students get attracted and motivated and this will contribute to the good academic performance of students (Kinder, 2003).

The findings are also in agreement with Waga (2013) and the United Nations Children's Emergency Fund (U.N.I.CEF) (2006) that revealed that access to safe drinking water, availability and access to sanitation facilities, promotion of hand washing facilities, and hygiene education positively influenced pupils' academic performance. Water is linked to school attendance and academic performance. The findings also concur with Yakubu (2017) conducted a study on space for convenience planning and academic performance of secondary school students in Oyo State, Nigeria, and concluded that toilet and water facilities contribute immensely to the academic performance of students. This is the same finding in a study done by Abbas (2021) on the association between the presence of sanitation facilities and school enrolment in Pakistan.

Nabaseruka (2010) observed that living conditions affected students' academic performance and that where the living academic performance was affected positively but where the living conditions were poor, students' academic conditions were good, and students' performance was negatively affected.

The findings are also in agreement with Comfort, O., A., and Veronica, O, A, (2016) who conducted a study on the impact of physical facilities on students' level of motivation in senior secondary schools in southwest Nigeria and concluded that there was a significant relationship between physical facilities and students' level of motivation and academic performance. This is

the same finding in a study done by Amadi (2019) on physical resource availability and the academic performance of students in the universal basic education scheme in Rivers State.

5.3.3 Effect of C-curricular Infrastructure Utilization on Students' Academic Performance in Selected Public Secondary Schools in Zombo District of Uganda

The study sought to determine the effect of co-curricular infrastructure utilization on students' academic performance in selected public secondary schools in the Zombo district of Uganda. The study established a weak positive correlation between indirect infrastructure utilization and students' academic performance in selected public secondary schools in the Zombo district of Uganda. Findings revealed that the availability and effective use of a playground, music/theatre rooms, worship rooms, entertainment hall, and room for indoor games has a moderate slight positive bearing on students' academic performance. Results showed that the availability and effective use of co-curricular infrastructure in the selected public secondary schools in the Zombo district slightly leads to better students' academic performance.

The findings are in agreement with Doreen Ahumuza's (2020) conducted study on school infrastructure utilization and students' academic performance in secondary schools in Kajara County Ntungamo district and concluded that there was a moderate positive correlation between school infrastructure utilization and students' academic performance. The findings also concur with Strong (2005) who stated that participation in co-curricular activities can help learners improve their concentration, memory, and classroom behavior as cited in Ahumuza (2020). Trudeau and Shephard (2015) as cited in Ahumuza (2020) have demonstrated that quality physical education produces important physical education benefits like increased activity and fitness while

having no ill effect on academic learning. The findings are also in agreement with Anaman et al., (2022) who conducted a study on infrastructural challenges and students' academic performance: evidence from a developing nation and concluded that schools require sports fields, music rooms, church halls, mosques, and theatres for students to perform better.

The findings are also in agreement with Anaman et al., (2022) who conducted a study on infrastructural challenges and students' academic performance: evidence from a developing nation and concluded that schools require sports fields, music rooms, church halls, mosques, and theatres for students to perform better.

The findings are also in agreement with Comfort, O., A., and Veronica, O, A, (2016) who conducted a study on the impact of physical facilities on students' level of motivation in senior secondary schools in southwest Nigeria and concluded that there was a significant relationship between physical facilities and students' level of motivation and academic performance. This is the same finding in a study done by Amadi (2019) on physical resource availability and the academic performance of students in the universal basic education scheme in Rivers State.

The findings concur with Nasir et al (2018) who conducted a study on the impact of co-curricular activities on student's academic achievement at the secondary school level in southern districts of Khyber, Pakhtunkhwa and concluded that co-curricular activities have a great influence on student's academic achievement. This is the same finding in a study done by Othoo, H. O. & Omondi, K. (2022) on the impact of students' involvement in co-curricular activities on academic performance in Gem sub-county, Siaya County, Kenya.

The finding is also in agreement with Ayesha, B. & Saghir, A. (2020) who conducted a study on the correlation between co-curricular activities and academic achievements of students in Punjab, Lahore Pakistan, and concluded that there was a moderate positive relationship between participation in co-curricular activities and academic achievement of students. This is the same finding in a study done by Singh (2017) on the effect of co-curricular activities on the academic achievement of students which concluded that on the whole, the overall effect of co-curricular activities on the student's academic performance and personality development is positive and it complements the attainment of education's main goal of bringing change in students' behavior.

The findings also concur with Rabia et al. (2020) who conducted a study on the effects of sports facilities on the academic performance of female students of elementary classes in the district of Lahore, Pakistan, and concluded that in elementary schools, the academic performance of students was significantly associated with sports facilities in school premises.

5.4 Conclusions

5.4.1 Effect of direct infrastructure utilization on students' academic performance in selected public secondary schools in the Zombo district of Uganda

The study concludes that there is a moderate positive effect of direct infrastructure utilization on students' academic performance in selected public secondary schools in the Zombo district of Uganda. The study found that a unit increase in direct infrastructure utilization would lead to a 50.3% increase in students' academic performance in selected public secondary schools in the Zombo district of Uganda. The study established that the utilization of classrooms, laboratories, libraries, and computer laboratories influences students' academic performance in selected public secondary schools in the Zombo district of Uganda.

5.4.2 Effect of indirect infrastructure utilization on students' academic performance in selected public secondary schools in Zombo district of Uganda

The study concluded that there was a moderate positive effect of indirect infrastructure utilization on students' academic performance in selected public secondary schools in the Zombo district of Uganda. The study found that a unit increase in indirect infrastructure utilization would lead to a 47.5% increase in students' academic performance in selected public secondary schools in the Zombo district of Uganda. The study established that the utilization of washrooms, dormitories, dining halls, sick bays, staff houses, and clean sources of drinking water influences students' academic performance in selected public secondary schools in the Zombo district of Uganda.

5.4.3 Effect of co-curricular infrastructure utilization on students' academic performance in selected public secondary schools in Zombo district of Uganda

The study concludes that there is a slight positive effect of co-curricular infrastructure utilization on students' academic performance in selected public secondary schools in the Zombo district of Uganda. The study found that a unit increase in direct infrastructure utilization would lead to a 38.2% increase in students' academic performance in selected public secondary schools in the Zombo district of Uganda. The study established that the utilization of playgrounds, music/theatre rooms, worship rooms, entertainment halls, and rooms for indoor games influence students' academic performance in selected public secondary schools in the Zombo district of Uganda.

5.5 Recommendations

5.5.1 Effect of Direct infrastructure utilization on students' academic performance in selected public secondary schools in Zombo district of Uganda

The study recommends that the government should ensure adequate provision and efficient use of direct infrastructure (classrooms, laboratories, libraries, and computer laboratories) to improve students' academic performance and attract learners who will be able to complete the secondary education cycle. This is because the availability and proper use of direct infrastructure ensures the stay of learners and their successful completion.

5.5.2 Effect of Indirect Infrastructure utilization on students' academic performance in selected public secondary schools in the Zombo district of Uganda

The study recommends that the government and board of governors ensure adequate provision and effective utilization of indirect infrastructure (washrooms, dormitories, dining halls, sick bays,

staff houses, and clean sources of drinking water) is adequate to improve students' academic performance. This is because the availability and proper use of indirect infrastructure improve students' academic success.

5.5.3 Effect of co-curricular Infrastructure Utilization on students' academic performance in selected public secondary schools in Zombo district of Uganda

The study recommends that the government and board of governors ensure that co-curricular infrastructure (playgrounds, music rooms, worship rooms, entertainment halls, and rooms for indoor games) are available and properly used to enhance students' academic performance. This is because the availability and proper use of co-curricular infrastructure ensures students participate in physical education and out-of-class activities like games and sports, music dance and drama, and prayers for the different denominations which leads to all-around learning and success in academics.

5.6 Areas for Further Research

Further research needs to be conducted on the influence of government policy on school infrastructure on students' academic performance in selected public secondary schools in the Zombo district of Uganda.

Further study should be conducted on the effects of school management on students' academic performance in selected public secondary schools in the Zombo district of Uganda.

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INTRODUCTORY LETTER

MUNI UNIVERSITY
P. O. BOX 725, ARUA

Faculty of Education

Date: 8/4/2023

TO WHOM IT MAY CONCERN

Dear Sir/Madam

RE: INTRODUCTORY LETTER OF OBEDLING JOHNSON THOMBU – 2021/U/MED/00328

This is to introduce the above-named Muni University student pursuing a degree in Master of Education in Educational Planning and Management.

As part of the requirements for the award of a Master's Degree, the student is required to undertake research in an area of interest and submit a report. His research proposal was approved by the faculty and is now ready to proceed and collect data. The research topic is School Infrastructure Utilization and Students' Academic Performance in Selected Public Secondary Schools in Zombo District, Uganda

The purpose of this letter is to kindly request you to accord him the necessary assistance.

Yours Sincerely,

Joyce Bukirwa Rebecca (PhD)

Dean Faculty of Education

Muni University

PAKADHA SEED SECONDARY SCHOOL

P.O. BOX 143, PAIDHA – ZOMBO (U)

TEL: 0782016199

Email: pakadha.seedsecondaryschool@yahoo.com

Our ref: ……

Your ref: ……

Date: 27/04/2023

TO WHOM IT MAY CONCERN

Dear sir/ Madam,

RE: PERMISSION FOR OBEDLING JOHNSON THOMBU

The above referenced is one of my Staff and a student at Muni University **pursuing** Master of Education in Educational Management and Planning. He has been granted permission to be away from school from Thursday 27th April 2023 to Friday 5th **May** 2023 to collect data from the intended schools as part of the requirement for the award of Master degree of Muni University.

The purpose of this letter is to kindly request you to accord him the necessary assistance,

Yours sincerely,

DONGE FRANCIS

HEAD TEACHER

PAKADHA SEED SECONDARY SCHOOL

THE HEADTEACHER Date 27/4/23 PAKADHA SEED SCHOOL

A REPLICA OF THE HEADTEACHERS' CONSENT LETTER

TITLE OF THE STUDY

School Infrastructure Utilization and Students' academic performance in Zombo District – Uganda.

Headteacher of the school consent form.

I give consent to you to approach teachers of my institution to participate in the above-named study. I have read the information on the study statement explaining the purpose of the study and understand that; -

- The role of my school is voluntary.
- Headteacher, teachers, and students will participate, and that permission will be sought from them.
- My schoolteachers' and students' names will not be used nor will be identifiable in any written reports about the study.
- My school will not be identifiable in any report about the study.
- The participants from my school will be free to withdraw from the study at any time without any penalty.
- All the information obtained in the study will be treated with strict confidence.

Umikowun Cointa ..... Head teacher

Zeu Secondary School - Headteacher, Date..... - P.O. Box 159, Paidha

Stamp

..... Signature

27/4/2023. ..... Date

CONSENT LETTER FOR HEADTEACHERS AND DIRECTOR STUDIES.

OBEDLING JOHNSON THOMBU

MUNI UNIVERSITY

P.O. BOX 725, ARUA - UGANDA

RE: LETTER OF CONSENT

I am a master's student at Muni University Pursuing Master of Education in Educational Planning and Management. I intend to conduct a study: School Infrastructural Utilization and Students' Academic Performance in Selected Public Secondary Schools in Zombo District – Uganda. Muni University has approved this study. You are requested to take part in answering the questions about School Infrastructural Utilization and Students' Academic Performance in selected public Secondary schools in Zombo District.

You are free to take part in answering the questions and stop at any point. To ensure confidentiality, your responses will stay unknown, and no names shall be referenced in the final research report.

I understand this information and consent to participate fully, and completely under the conditions articulated above.

Name:....YOACEL JOSEPH.....
Signed: .....
Date: ...27/4/2023.....

CONSENT LETTER FOR STUDENTS

OBEDLING JOHNSON THOMBU

MUNI UNIVERSITY

P.O BOX 725, ARUA - UGANDA

RE: LETTER OF CONSENT

I am a master's student at Muni University pursuing a Master of Education in Educational Planning and Management. I intend to conduct a study: School Infrastructure Utilization and Students' Academic Performance in Selected Public Secondary Schools in Zombo District-Uganda. Muni University has approved this study. You are requested to take part in answering the questions about School Infrastructure Utilization and Students' Academic Performance in selected public Secondary schools in Zombo District.

You are free to take part in answering the questions and stop at any point. To ensure confidentiality, your responses will stay unknown, and no names shall be referenced in the final research report

I understand this information and consent to participate fully, and completely under the conditions articulated above.

Name:..LEMBANGO PHIONA.....

Signed:....

Date:...27/4/2023.....

Appendix 1**: Questionnaire for students.**

Dear respondent,

This questionnaire is intended to facilitate a study about school infrastructure utilization and students' academic performance in selected public secondary schools in Zombo District, West Nile Sub region of Uganda. School infrastructure utilization is the independent variable while students' academic performance is the dependent variable. The study is for academic purposes only and is carried out as a partial requirement of the award of Master of Education. Education Planning and Management of Muni University. Your honest responses will be highly appreciated and treated as confidential.

Section A: Background information.

Instructions: Please tick the most applicable.

1. What is your gender? 1.☐ Male 2.☐ Female
2. What is your age? 1.12-15yrs☐ 2.16-18yrs☐ 3.19-21yrs☐ 4.21 and above☐
3. How long have you stayed in this school? 1. Less than a yr☐ 2. 1-3yrs☐ 3.4-5yrs☐ 4. More than 5 yrs☐
4. What is your class? 1. S.1☐ 2.S.2☐ 3.S.3☐ 4.S.4☐ 5.S.5☐ 6.S.6☐

Section B: School information

Instructions: Please evaluate by ticking on a scale of 1-5 indicating the extent to which you agree with the statement.

Please use the key below to answer the following question by indicating.

1. If you strongly disagree (SD)
2. If you disagree (D)
3. If you are not sure (NS)
4. If you agree (A)
5. If you strongly agree (SA).

	SECTION B:					
		SD	D	NS	A	SA
	Direct Infrastructure	**1**	**2**	**3**	**4**	**5**
D1	Classrooms are adequate in this school					
D2	Classrooms have adequate ventilation	1	2	3	4	5
D3	The school has laboratories for chemistry well stocked and used by learners.	1	2	3	4	5
D4	The school has laboratories for physics well stocked and used by learners.	1	2	3	4	5
D5	The school has laboratories for Biology well stocked and used by learners.	1	2	3	4	5
D6	The school has a library that is well-stocked with relevant textbooks.	1	2	3	4	5
D7	Laboratories are utilized for optional subjects because of inadequate classroom	1	2	3	4	5

D8	The school has a computer laboratory with enough computers.	1	2	3	4	5
	Indirect infrastructure	**SD**	**D**	**NS**	**A**	**SA**
I1	The school has spacious dormitories for boys.	1	2	3	4	5
I2	The school has spacious dormitories for girls.	1	2	3	4	5
I3	The school has adequate washrooms for boys,	1	2	3	4	5
I4	The school has adequate washrooms for girls.	1	2	3	4	5
I5	There is a dining hall in the school	1	2	3	4	5
I6	The school has a sick bay	1	2	3	4	5
I7	The school has staff houses for all the teachers/ support staff.	1	2	3	4	5
I8	There is a clean source of water within the school.	1	2	3	4	5
	Co. curricular infrastructure	**SD**	**D**	**NS**	**A**	**SA**
CO1	The school has a playground	1	2	3	4	5
CO2	There is a music/ theatre room in the school.	1	2	3	4	5
CO3	The school has worship rooms for all the known denominations.	1	2	3	4	5
CO4	There is an entertainment hall in the school.	1	2	3	4	5
CO5	The school has room for indoor games.	1	2	3	4	5

Section C: Students' Academic Performance.

S/N	**Statement**	**SD**	**D**	**NS**	**A**	**SA**
AP1	Students have computer knowledge	1	2	3	4	5
AP2	Performance standards in terms of grade scores in this school are high	1	2	3	4	5
AP3	Students perform better in weekly tests and end-of-term exams	1	2	3	4	5
AP4	I am satisfied with the level of students' academic performance in this school	1	2	3	4	5
AP5	Students perform well in practical lessons	1	2	3	4	5

Thank You

Appendix 2: Interview Guide for Head Teachers, and Director of Studies.

	SECTION D: School Infrastructure	
	Direct Infrastructure	Opinion of the interview on the corresponding items
1	Share with me the kind of direct infrastructure available in this school.	
2	How would you rate the adequacy of the direct infrastructure in your school?	
3	How has the direct infrastructure affected learners' performance in this school?	
4	What are the indirect infrastructure available in this school?	
5	How would you rate the adequacy of the indirect infrastructure in your school?	
6	How has the indirect infrastructure affected students' performance in this school?	
7	What are the co-curricular infrastructure available in your school?	
8	How would you rate the adequacy of the co-curricular infrastructure in your school?	
9	How has co-curricular infrastructure affected students' academic performance in this school?	

Dear respondents,

These items for the interview are intended to capture your view on how school infrastructure (direct infrastructure, indirect infrastructure, and co-curricular infrastructure affects students' academic performance in selected public secondary schools in Zombo District, West Nile Sub-region of Uganda. Considering that you are familiar with students' academic performance in your institution from 2017-2022, or part of this period, I kindly request you to answer or give your honest opinion on the following items below. Note that the study is for academic purposes only and is carried out as a partial requirement of the award of Master of Education - Education Planning

and Management of Muni University. Your honest responses will be highly appreciated and treated confidentially.

Institution……..…….….

Title …….

Thank You.

Appendix 3: UCE results for selected schools in Zombo district 2020 – 2016

2020								
S/No	**Schools**	**Div 1**	**Div 2**	**Div 3**	**Div 4**	**Div 7**	**Div 9**	**Total**
1	St. Aloysius College Nyapea	00	09	12	08	01	00	**30**
2	Paidha seed SS	07	15	34	61	00	02	**119**
3	Pakadha Seed SS	01	12	34	41	00	00	**88**
4	Aluka SS	03	10	44	35	00	03	**95**
5	Zeu SS	03	04	12	2	00	05	**49**
6	Warr Girls' SS	00	05	14	15	00	00	**36**
7	Jangokoro SS	00	03	06	14	00	00	**23**
2019								
1	St. Aloysius College Nyapea	01	03	09	10	00	00	**23**
2	Paidha Seed SS	01	16	35	57	00	04	**113**
3	Pakadha Seed SS	02	04	24	57	00	00	**87**
4	Aluka SS	00	08	30	54	00	09	**101**
5	Zeu SS	00	07	15	35	00	12	**69**
6	Warr Girls' SS	00	02	14	12	00	00	**28**
7	Jangokoro SS	00	01	03	11	00	04	**19**
2018								
1	St. Aloysius College Nyapea	00	07	10	14	00	00	**31**
2	Paidha Seed SS	02	08	30	51	00	06	**97**
3	Pakadha Seed SS	02	11	21	36	02	05	**77**
4	Aluka SS	03	10	23	46	00	06	**89**
5	Zeu SS	01	09	12	40	00	26	**69**
6	Warr Girls' SS	01	05	14	28	00	05	**54**
7	Jangokoro SS	00	02	05	19	00	19	**45**
2017								
1	St. Aloysius College Nyapea	01	08	16	10	00	00	**35**
2	Paidha Seed SS	00	10	28	76	00	06	**112**
3	Pakadha Seed SS	01	10	22	37	00	13	**83**
4	Aluka SS	00	05	12	71	00	08	**96**
5	Zeu SS	02	04	09	33	00	12	**58**
6	Warr Girls' SS	00	01	04	33	00	05	**43**
7	Jangokoro SS	00	01	03	11	00	05	**20**
2016								
1	St. Aloysius College Nyapea	00	04	07	20	00	00	**31**
2	Paidha Seed SS	00	12	30	85	01	15	**143**
3	Pakadha Seed SS	00	02	11	40	00	06	**59**
4	Aluka SS	00	13	20	69	00	24	**126**
5	Zeu SS	00	01	10	52	00	15	**78**
6	Warr Girls' SS	00	03	05	35	00	11	**57**
7	Jangokoro SS	00	01	04	25	00	17	**47**
		0	36	87	326	1	88	**541**

Appendix 4: UACE results for selected schools in Zombo District 2022 - 2016

Year	3 Principles	2 Principles	1 Principle	Subsidiary pass	Failure	Total Number of candidates
2022	03	05	06	02	00	16
2020	05	09	09	09	01	33
2019	04	07	06	07	01	25
2018	03	02	08	12	01	24
2017	03	10	07	07	00	27
2016	07	05	07	01	01	18