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# The Effect of Direct Infrastructure Utilization on Students' Academic Performance in Public Secondary Schools in Zombo District, Uganda

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## Abstract

*The study examined the effect of direct infrastructure utilization on students' academic performance in public secondary schools in Zombo district of Uganda. The study aimed to examine the effect of direct infrastructure utilization on students' academic performance in public secondary schools in Zombo district of Uganda. A cross-sectional study design was used. Both quantitative and qualitative approaches were adopted with a sample of 150 out of 224 target population. A simple random sampling technique was used to select amongst the students, while purposive sampling was used to determine the headteachers and director of studies. Quantitative data analysis consisted of descriptive statistics (frequencies and percentages) and inferential statistics (Pearson correlation) and regression, while qualitative research used a thematic approach. Findings revealed a moderate positive correlation (r = .503) between direct infrastructure utilization and students' academic performance. Results of regression analysis of direct infrastructure utilization revealed that a unit increase in direct infrastructure utilization leads to an improvement in students' academic performance by 30.3% and was statistically significant at 1%. Thus, it was concluded that direct infrastructure utilization significantly affected academic performance in selected public secondary schools in the Zombo district of Uganda. It is recommended that secondary schools in Zombo district of Uganda should focus on direct infrastructure to improve students' academic performance.*

**Keywords:** *Infrastructure Utilization, Students' Academic Performance, Public Secondary Schools*

## Background to the study

The background was organized into four perspectives: 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 direct 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 direct infrastructure.

### *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 made globally and a valuable resource for any country's economic development and expansion (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 in 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, especially from the Church Missionary Society, the White Fathers, the Mill Hill Fathers, and the Comboni Missionaries, in the late nineteenth century (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. Nevertheless, the financial oversight of the schools was partially under the control of the colonial government. 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). After that, better schools were constructed, teacher evaluation and training programmes were implemented, and government grants were officially recognised. Nevertheless, as Ahumuza (2020) points out, the Thomas Education Committee recommended that governments get engaged in subsidising 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. 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 emphasised both qualitative and quantitative expansion at the primary level. The Castle Commission emphasised 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 for 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 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 Zombo district of Uganda has been impacted by the utilization of school facilities.

### *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 potential to achieve more from birth. The educational system should be established to remove any obstacles in a person's life, whether institutional or structural. 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 should not be a threat to social justice. As a result, social institutions like educational institutions should work to foster an enabling atmosphere by providing the infrastructure required for academic success. The educational institution should treat all students equally by providing the necessary facilities. 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 needed 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 resources. The concept, the author argues, is also helpful in comprehending how resources for infrastructure affect students' academic performance. Therefore, the current study aimed to evaluate how well certain public secondary schools in Uganda's Zombo area were using their school facilities.

### *Conceptual perspective*

The utilization of direct infrastructure is the independent variable in this study, and refers to the physical facilities like classrooms, laboratories, libraries, and computer laboratories, whereas academic accomplishment is the dependent variable. The quality and quantity of knowledge, abilities, procedures, positive attitudes, behaviours, and philosophies that learners attain or acquire are referred to as academic performance (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 student's performance in a test or examination 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 calibre and quantity of acquired knowledge, skills, techniques, constructive attitudes, behaviour, and philosophical understanding (Ferguson, 1990). This competence is assessed by the student's performance in a test or examination 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 was school infrastructure. School infrastructure is a collection of connected structural components that serve as the basis for a whole development structure. The researcher focused on the study's physical infrastructure, health and sanitary infrastructures, and co-curricular facilities, emphasising the calibre of classrooms, libraries, and laboratories. In addition to making, it difficult for students to focus, crowded classroom environments unavoidably reduce the time teachers can devote to creative instructional strategies like group projects and cooperative learning.

***Contextual perspective***

According to Uganda National Examinations Board (UNEB) results of 2022, out of 613 students who sat for Uganda Certificate of Education (UCE) from the schools under study, only 12 (2%) were in Division 1, 76 (12.4%) obtained Division 2, and 178 (29.0%) got Division 3. More students, 298 (48.6%), were in Division 4, 47 (7.7%) failed, and 2 students (0.3%) did not sit for all the examinations. The total number of students who got from Division 1 to 3 was 266 (43.4%) and by National standards qualified for admission to the next level of education. The total number that got from Division 4 to 9 was 347 (56.6%) and by national standard did not qualify for admission to the next level of education. The situation at an advanced level of education was not any better as students' academic performance was also wanting. For example, during the same year of sitting, out of 78 students who sat for the examinations, 6 students (7.7%) obtained 3 principal passes, 26 students (33.3%) got 2 principal passes, 31 students (39.7%) obtained 1principal passes, and 15 students (19.2%) obtained subsidiary passes. The total number of students who obtained 2 principal passes and above was 32 (41%) which was the minimum requirement for joining tertiary institutions, and the total number of students who obtained 1 principal pass down to subsidiary passes was 46 (59%). This category could not proceed to the next level of education as they did not meet the requirement. The poor performance was partly attributed to direct infrastructure utilization by the public secondary schools in Zombo District of Uganda.

The provision of educational and physical facilities at Zombo's secondary schools was unbalanced, according to a report from the district's education office dated 2021. In most schools, classes typically had 80 to 100 students. Some schools had insufficient libraries, staff offices, labs, restrooms, and classrooms. While some schools had leaking roofs and muddy, dusty floors, others lacked 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 does not seem to provide a conducive learning environment, and this could negatively impact the student's academic progress and the teaching and learning process in the long run.

Therefore, the researcher needed to determine how schools' physical facilities impacted pupils' academic performance in 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 |
|---|---|---|---|---|---|---|---|
| 2022 | 12 | 76 | 178 | 298 | 2 | 47 | **613** |
| 2020 | 19 | 70 | 193 | 251 | 5 | 35 | **573** |
| 2019 | 7 | 44 | 117 | 225 | 1 | 33 | **427** |
| 2018 | 9 | 49 | 126 | 241 | 2 | 75 | **502** |
| 2017 | 4 | 39 | 94 | 271 | 0 | 49 | **457** |

*Source:* UNEB Results for individual schools

From Ttable 1, students' academic performance at UCE from 2017 to 2022 has been generally poor. This may be partly attributed to the infrastructures available in the schools under the study.

**Statement of the problem**

According to Uganda National Examinations Board (UNEB) results for the last five years (2017-2022), students' academic performance has been generally very poor in Zombo District compared to other districts. For example, only 51 students obtained Division 1(2.0%), with the majority in Division 4, 1286 (50.1%), and Division 9, 239 (9.3%) for the five years. This could be partly blamed on direct infrastructure utilization.

The direct 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 direct infrastructure of the school plays a crucial role in secondary schools realizing their educational goals. A good school infrastructural environment, according to UNESCO (2010), the World Bank (2017), and Barret (2019), includes buildings in good condition, an

adequate number of efficiently organised 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 high-quality infrastructure makes improved instruction, higher student outcomes, and lower dropout rates possible (Barret, 2019).

Uganda is not an exception to the rule that many nations utilise a fragmented approach to investing in their education infrastructure. However, education officials increasingly emphasise 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 Zombo District and the West Nile sub-region. Poor performance might have resulted from this

(Tugineyo, 2018; NAPE reports, 2018).

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

**Purpose of the study**

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

**Objective of the study**

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

**Research Question**

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

**Research Hypothesis**

Direct infrastructure utilization significantly affects students' academic performance in public secondary schools in Zombo District.

**Significance of the study**

The Ministry of Finance, Planning and Economic Development and the Ministry of Education and Sports may find this study helpful in formulating policies and strategies to promote the development of direct infrastructure in secondary schools to increase students' access to education and the disbursement of infrastructure funds to Uganda's public secondary schools to realise Uganda's Vision 2040, the Sustainable Development Goal #4, and the National Development Plan III.

As stakeholders, the headteachers, the Board of Governors, and the Parent and Teachers' Association (PTA) may find the study findings beneficial in undertaking direct infrastructure that influences kids' academic success.

**Justification of the study**

Low-level students' academic achievement is caused by poor and insufficient direct infrastructure in the West Nile sub-region, particularly in the Zombo district of Uganda. However, no research has been done in the Zombo district. This significant study provided more information on how direct infrastructure is used and how well pupils perform academically in a sample of public secondary schools in Zombo district.

## Scope of the study

The study was to establish the effect of direct infrastructure utilization on students' academic performancein a few chosen public secondary schools in Zombo District.The study considered five years from 2017 to 2022.

## Literature Review

This study reviewed the literature on how direct infrastructure affects students' academic performance. Nevertheless, the section begins with theoretical and conceptual reviews.

## Theoretical review

Classical Liberty Theory was mainly 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 institutional or physical (Orodho, 2003).According to the classical liberty theory, granting everyone the same education access will help encourage social mobility.

Rousseau believed that if society pays people following their standing, personality traits should not 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 the necessary facilities (Orodho, 2003).Therefore, it is essential to ensure that students from all regions of the nation have access to the physical infrastructure required to offer equal education access, which will later raise their living standards.

The study was also influenced by Skinner's (1985) Motivational Theory of Learning. It claims the predicted reward affects students' motivation to complete a task. When the teacher effectively motivates 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 behaviour toward the accomplishment of the desired goals.Therefore, motivating students should be done through various methods, such as giving them career advice, providing 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 direct infrastructures to improve learning and 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 individuals and society, also guided the study. According to Schultz (1962), education improves 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 & King, 1991). Education and knowledge expansion are two key drivers of economic progress. They are not natural resources; instead, they are largely man-made, which necessitates savings and investments. There is proof that those with higher education and competence almost invariably make more money than others (Schultz, 1963, p. 46). Therefore, countries should invest in school infrastructure to enable access to education by all necessary for attaining human capital development. This theory, therefore, resonates with the need to provide the direct infrastructure necessary for human capital development.

## Conceptual Review

The use of the direct infrastructure served as the independent variable in this study, while the students' academic performance served as the dependent variable. Academic performance refers to the quality and quantity of knowledge, skills, techniques, positive attitudes, behaviours, and philosophy that learners acquire (Ferguson, 1990). Students' performance is defined as the ability of students to attain something (Oxford Advanced Learners Dictionary, 2014). The student's performance in a test or examination 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, behaviour, and philosophical attainment or acquisition were indicators of academic performance in this study (Ferguson, 1990). The student's performance on a test or examination 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.

Direct infrastructure 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 direct infrastructure and will continue to concentrate on physical infrastructure, primarily focusing on the calibre of classrooms, labs, and libraries. In addition to making it difficult for students to focus, crowded classroom environments unavoidably reduce the time teachers can devote to creative instructional strategies like group projects and cooperative learning.

## Review of Related Literature

This section reviewed the literature on how using the infrastructure directly affects students'

academic performance.

**Direct infrastructure utilization and students' academic performance**

Learning infrastructure in the context of this study includes classrooms, libraries, laboratories, and computer laboratories, among others. A study done by Ana et al. (2015) namely: 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 shows 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 West Nile Zombo District in Uganda. Several studies have shown that enrolment increases with a reduced 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 were utilised 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 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)—students' academic achievement 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 on Factors that affect academic achievement in a few Rwandan public secondary schools.Frequencies, ratios, percentages, and regression analysis were used to analyse the data, which was collected using a questionnaire and document review guides following the notion of the education production function.The results showed that the availability of physical resources like libraries and laboratories positively impacted student academic performance.The quantity and calibre 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 in 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 analysed 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 precisely 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.Kanyoi (2019) employed a descriptive survey design, questionnaires, and interview guides to collect data. Data were then analysed 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 this 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.

Kosgei (2018) undertook study, Adequate laboratories and their impact on chemistry performance in secondary schools in Kenya's Uasin Gishu County's Kesses sub-county.A descriptive and correlation research design was used, with stratified random sampling to get the parent population, simple random sampling to get the sample population, and a questionnaire as the data collection method. The results revealed a very substantial correlation between laboratory suitability and academic achievement.

## Methodology

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, instruments, validity and reliability, data management and analysis, measurement of variables, and ethical considerations. It also includes the instruments' pretesting and the data collection protocol.

### Research design

Cross-sectional survey methodology, including both qualitative and quantitative methodologies,was used in the study. Mann, (2003). This was mainly employed because it makes choosing a small sample of people from a larger population easier to serve as an inference. 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 Fowler (1993) advised, 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).

### 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 Zombo District.

### Sample Size and Selection

Using the Krejcie and Morgan sample size table, the following sample size in Table 1 was used.

**Table 2: 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).

## Sampling Techniques and Procedure

Both probability and non-probability sampling methods were used in the combination of sampling approaches. Respondents were randomly chosen from the population with probability sampling approaches, whereas with non-probability sampling techniques, participants were specifically chosen.The probability sampling approach and the non-probability sampling technique used essential random sampling. Due to their large number, a straightforward random selection procedure was utilised to choose the students, ensuring that every student in

every school had an equal opportunity to participate in the study and preventing bias. It also reduced the time and money that had to be spent. The Headteachers and Directors of Studies were chosen through purposeful sampling since it was anticipated that they would have more excellent in-depth knowledge of how the school infrastructure was used and how well the students performed academically.

## Data Collection Methods

### *Questionnaire survey*

A standardised questionnaire survey 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 significant to interview, a questionnaire survey was employed to save time.

### *Interview*

According to Mugenda and Mugenda (1999), structured interviews were utilised 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 clarifying unclear responses during structured interviews. To gather information for the study, structured interviews were created.

### 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.

### *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 independently without help.

### *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).This study time was spent using the probing interviewing technique to get a more in-depth explanation of the problem from the respondents.This was mainly because the respondents needed to be encouraged to elaborate on or better clarify their responses and ideas so that a more comprehensive comprehension

of the study's findings could be more readily attained.The researcher gave the interviewees questions, and their opinions were recorded. The information gathered through interviews was added to the information gathered through questionnaires.

### 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):

CV I= Number of items declared valid
All the items in the questionnaires

**Table 3: 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 = ≈ .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.

## Reliability

They were pilot-tested on comparable respondents in secondary schools who 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 analysed 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 4: 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, 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.*

## Procedure of Data Collection

The authorities received a letter of authorisation from Muni University. The researcher went to

the schools and requested permission from the Headteachers to gather data from the directors of studies and pupils. The researcher also requested permission from his Headteacher (Pakadha Seed Secondary School). The researcher then examined the data.

## Data Analysis

### Quantitative data analysis

Frequencies and percentages and inferential statistics like Pearson Product Moment Correlation, Regression, and ANOVA were significant components of quantitative data analysis. The respondents' opinions on using 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).This was squared and corrected to calculate the percentage of variance in the dependent variable that may be attributed to the independent variables.An ANOVA was computed to identify the aspects of using the school infrastructure that had the biggest impact on students' academic achievement.

### Qualitative data analysis

Content analysis was applied to modify qualitative data and reassemble it into more concise, comprehensible words.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.

### Ethical Consideration

The Oxford Advanced Learners' Dictionary (8$^{th}$ Edition) describes the word ethical as morally correct or acceptable. Johnson (2008), as cited in Kanyoi (2019), proposes that Ethics are the principles and guidelines that aid us in upholding the things we value. Ethics is a collection of values and principles to answer the problems of what is right or wrong in human affairs. 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 behaviour, 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 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 was sought from the participants. All participants were asked to consent in writing or complete an assent form. Additionally, participants could 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 the participants did not feel comfortable answering were entirely up to them. Participants' privacy and wishes were respected.

### Presentation, Analysis, and Interpretation of Findings

The results are given, looked at, and understood in this section. It is divided into four smaller pieces. In the first subsection, the response rate results are shown. The second sub-section reports findings related to respondents' demographic characteristics. 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 Zombo district of Uganda. Results for the dependent variable are presented in the fourth subsection.

### 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 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 5: Response Rate**

| Category of population | Sampled size | Response Rate | Percentage (%) |
|---|---|---|---|
| Headteachers | 07 | 05 | 71.4 |
| Director of Studies | 07 | 05 | 71.4 |
| Students | 136 | 210 | 140 |
| Total | 150 | 220 | 94.3 |

**Source:** Data from the field

When compared to the recommended 67% response rate (Amin, 2005; Mugenda & Mugenda, 1999), The response rate in Table 6 was 94.3%, which was much higher. As a result, the outcomes indicated that the 224 target participants had a very high response rate.

### Demographic characteristics

Tables 6, 7, 8, and 9 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 shown explicitly in Table 6.

**Table 6: 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 number of women (46.2%) also participated in the survey. This indicates that the study's conclusions benefited greatly from the perspectives of both sexes.

**Table 7: 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 more significant 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 participated in the survey (10.4%, 36.7%, and 10.4%, respectively). This indicates that all age groups contributed significantly to the study's conclusions.

**Table 8: 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. However, the majority (65.3%) had remained longer than a year. This indicated that most people were the most reliable information sources because they were in control of and sufficiently knowledgeable about what occurred with the utilisation of school facilities and kids' academic performance in their schools.

**Table 9: 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

More respondents were in the S4 class, as shown in Table 10. However, 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 utilisation on students' academic performance in public secondary schools in 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 first to 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.

### Descriptive results on direct infrastructure utilisation

Students responded to eight questions about using direct infrastructure on a five-point Likert scale by checking the boxes next to their agreed-upon statements.The results are displayed in Table 10. The items are displayed in the first column, and columns 2 through 6 display the frequency and percentage of students' responses to each item. 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 results in Table 10, the analysis and interpretation of the findings on direct infrastructure utilisation are provided.

**Table 10: Descriptive results on direct infrastructure utilisation**

| Direct infrastructure utilisation | 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 are not 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 nine 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 five 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 the 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 were unsure.

The interpretation from this analysis is as follows. According to the findings, the majority of students felt that their Ugandan schools in Zombo region lacked adequate classroom space, which hurt the students' academic performance. In addition, most students believed that their classrooms had adequate ventilation in schools inZombo district of Uganda, thus not affecting students' academic performance. Most students believed that their schools had laboratories for chemistry, physics, and biology, thus positively affecting students' academic performance. While most students believed their schools lacked libraries 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.

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

**Inferential statistical results on direct infrastructure utilisation and students' academic performance**

The first claim that, "There is a significant effect of direct infrastructure utilisation on the academic performance of students in public secondary schools in the Zombo district of Uganda" Was tested.

**Table 11: Correlation co-efficient on Direct Infrastructure**

| | **Direct Infrastructure** |
|---|---|
| Academic performance | r .503<br>$r^2$ .253<br>p .000<br>N 210 |

**Source:** Data from the field

Findings in Table 11 demonstrate a moderately favourable 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 utilisation 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). It is shown that the significance of the correlation (p = .000) is less than the recommended critical significance at .05. Because of this, the hypothesis that, *"There is a significant effect of direct infrastructure utilisation on the academic performance of students in public secondary schools in Zombo district of Uganda''* was accepted.

**Table 12: 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 12 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.

### 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 their' academic performance by indicating their agreement using a five-point Likert scale in Table 13. The keys used were for direct, indirect, and co-curricular infrastructure. The analysis and interpretation of the findings about students' academic performance follow the presentations of the findings in Table 13.

Table 13: **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%) |

| Students' academic performance | SD | D | NS | A | SA | TOTAL |
|---|---|---|---|---|---|---|
| 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 13 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%). The comparisons show that the percentages of those who disagreed on items 1,3, and 4 were higher than those who agreed and were unsure. The percentages of those who agreed with items 2 and 5 were higher than those who disagreed and were unsure. Most students believed 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 student's academic performance in their schools. Thus, there were poor studentsacademics performances.

Performance: Those who agreed with items 2 and 5 believed that their schools had high-performance standards ingrade scores and that students performed well in practical lessons. Thus, there was high student academic performance. Interview findings from headteachers and the director of studies shed more light on the effect of school infrastructure utilisation on students' academic performance in 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, infrastructure utilisation (interview with the headteacher of school D, 5th May 2023)".* Only one school out of the seven schools under study had adequate direct infrastructure utilisation, thus affecting students' academic performance positively.

> *"Our school has adequate direct infrastructure utilisation (interview with Director of Studies of school E, 6th May 2023)"*

## Discussion

The study sought to establish the effect of direct infrastructure utilisation on students' academic performance in selected public secondary schools in Zombo district of Uganda. The study found a moderate positive correlation between natural infrastructure and students' academic performance in public secondary schools in Zombo district of Uganda. Findings revealed that the availability of adequate classrooms with adequate ventilation, science laboratories, well-

stocked libraries, and computer laboratories have a moderate positive bearing on students' academic performance. Results showed that adequate direct infrastructure in the selected public secondary schools in Zombo district leads to better students' academic performance, other factors being constant.

The findings agree 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 positively affected students' academic performance. The library size and the quality of the materials in it significantly affect students' learning and academic achievement (Bello, 2018). The findings also concur with Kennedy et al. (2020), who 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 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.

The findings also agree with Will et al. (2020), who observed that pupils' academic performance was significantly impacted by their place in the classroom and by their use of computers. This is the same view in a study carried out in 2018 by Siham Gaber and Faraq. 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 is the same finding in a study by Kanyoi (2019) on factors influencing the integration of ICT in teaching and learning in secondary schools in the Matungulu sub-county of Machakos County, Kenya. The finding revealed that inadequate computers negatively affected students' academic performance.

The finding also concur with a study by Kosgei (2018) on adequate laboratories and their impact on chemistry performance in secondary schools in Kenya's Uasin Gishu County's Kesses sub-county, which observed a very substantial correlation between laboratory suitability and academic achievement.

## Conclusion

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

### Recommendation

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.

## Areas for further research

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

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