School Environment and Students' Academic Performance in Government-Aided Secondary Schools: A Case Study of Northern Division, Mbale City.

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Declaration

I, Namisano Alex, declare that this research proposal entitled *"School Environment and Students' Academic Performance in Government-Aided Secondary Schools: A Case Study of Northern Division, Mbale City"* is my original work and has not been submitted to any academic institution for award of any Degree.

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Approval

We certify that this research proposal titled *"School Environment and Students' Academic Performance in Government-Aided Secondary Schools. A Case Study of Northern Division, Mbale City"* by Alex Namisano has been carried out under our supervision and is now ready for submission to the graduate school with our approval as supervisors.

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Dedication

I dedicate this proposal to my father, Mr. Dominic Namisano (RIP), and my mother, Mrs. Annet Namisano, not forgetting my dear wife, Mrs. Dorothy Namisano, who have stood with me all the way through this academic journey up to the end.

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Abstract

The study was on the relationship between school environment and the level of students' academic performance in government-aided secondary schools in Northern Division, Mbale City. The objectives were to examine the nature of physical school environment in government-aided secondary schools, to examine the level of academic performance in government aided secondary schools and to determine the relationship between the physical school environment and academic performance in government aided schools of Northern Division in Mbale city. Number of science laboratories, Number of libraries, Number classroom facilities, Number of textbooks, Presence of shades with seats, Presence of talking compounds, Presence of school farms, Presence of playgrounds denoted school environment and Grades at UNEB, students' projects and mock assessments denoted the level of students' academic performance in government-aided secondary schools in Northern Division of Mbale City. The study was conducted using a cross-sectional research design; data were collected from 120 respondents using questionnaire and interview guide. Questionnaire and interview data were analysed using descriptive statistics to determine the nature of physical school environment in government-aided secondary schools, to examine the level of academic performance in government aided secondary schools (objectives one and two). Pearson correlation used to analyse objective three using data from objectives one and two. The findings indicated that the physical school environment across the sampled schools is generally functional but characterized by significant disparities. Students report strong performance in national examinations, supported by competent teachers and a school culture that places high value on academic excellence. The findings show a moderately strong and statistically significant positive correlation ($r = 0.470$, $p < 0.01$) between the physical school environment and students' academic performance. The study concluded that although the physical learning environment in schools is moderately adequate, significant inconsistencies and inequalities in infrastructure across institutions negatively influence the quality of teaching and learning, thereby affecting students' educational experiences and outcomes. The study concluded that although learners perceive their academic performance positively and benefit from strong teacher quality and school culture, significant inequalities in resources and learning conditions persist across schools. The study concluded that the physical school environment plays a vital and statistically significant role in determining students' academic performance. It is recommended that government and education stakeholders prioritize targeted infrastructure investment, specifically directing resources toward the most under-resourced schools, recommended that education authorities prioritise targeted resource allocation and infrastructural improvement in the most disadvantaged schools and recommended that policymakers, school administrators and government stakeholders increase targeted investment in school infrastructure, focusing especially on upgrading classrooms, enhancing sanitation, improving lighting and ventilation and providing adequate learning materials.

Keywords: School Environment and Students' Academic Performance.

Chapter One

Introduction

1.0. Overview

A school environment is characterized by facilities and teacher-student relationships (Tadese and Mulu, 2022). These components significantly boost students' motivation, engagement and academic performance (Tadese and Mulu, 2022). Although scholars such as Tadese and Mulu emphasised on the benefits of quality instructional materials, research by Fryer (2013) show that low level of anxiety and depression and are less likely to engage in substance abuse.

This study assessed the nature of physical school environment, assess the level of academic performance and established the relationship between physical infrastructure and academic performance in government-aided schools in Northern Division in Mbale City.

1.1 Background

This section is divided into four sub-sections, namely; historical, theoretical and conceptual perspectives.

1.1.1 Historical background

Historically, formal education systems placed considerable emphasis on examination achievement and mastery of prescribed academic content (UNESCO, 2024). As mass education expanded during the twentieth century, researchers and education policymakers increasingly became interested in explaining why students attending different schools achieved different levels of academic success (OECD, 2020). The long-running debate concerning the relative contribution of schools, homes, peers and teachers to student achievement can be traced to influential educational research and has remained an important concern in education research (Mushtaq-ur-Rehman, 2016).

The concept of academic performance subsequently became increasingly associated with measurable learning outcomes which included examination scores, grades, progression and demonstrated proficiency in subjects such as mathematics, reading, science and languages (UNESCO, 2024).

The understanding of the school environment came to encompass not only physical facilities such as classrooms, laboratories, libraries, furniture, water and sanitation, but also teacher-student relationships, school climate, safety, discipline, instructional resources and the

organisation of learning (Tian and Sun, 2018). Thus, historically, there has been a gradual movement from viewing academic performance primarily as an individual student outcome to recognising it as an outcome produced within a wider educational environment involving the learner, teacher, school and community (UNESCO, 2024).

In Sub-Saharan Africa, the historical concern about students' academic performance has been closely associated with the rapid expansion of access to secondary education as governments expanded secondary education to provide opportunities for increasingly larger numbers of learners (World Bank, 2017). However, expansion in enrolment was not always matched by equivalent improvements in school infrastructure, instructional resources, teacher availability, sanitation and other conditions necessary for effective learning (Abuhassna et al., 2020). Consequently, attention increasingly shifted from access to education towards the quality of learning and academic outcomes (Abuhassna et al., 2020).

The school environment became particularly important because many secondary schools in the region have experienced challenges such as overcrowded classrooms, inadequate laboratories and libraries, insufficient instructional materials, poor sanitation, inadequate furniture, teacher shortages and unsafe or poorly maintained facilities (Madudili, 2019). Such conditions may limit the amount and quality of learning students receive and consequently affect their performance in school-based and national examinations (Madudili, 2019).

In Tanzania Mkumbo's (2013) study of secondary schools examined the relationship between school characteristics and students' examination performance against a background of declining Form Four examination outcomes. The study was prompted by deterioration in national examination performance, with the 2012 examination described as a particularly serious low point, when about 65% of candidates who took the examination failed. The study specifically investigated school characteristics and school climate as possible explanations for variations in academic achievement (Mkumbo, 2013).

Similarly, evidence from Tanzania indicates that school safety is directly relevant to learning outcomes. Research examining the impact of safe learning environments found that an unsafe school environment had significant negative effects on standardised reading and mathematics outcomes. This demonstrates that the African concern with academic performance has progressively expanded from examination results themselves to the school conditions that facilitate or hinder students' ability to achieve those results (Owoeye and Yara, 2018).

African education systems have sought to increase the number of students entering and completing secondary education and they have had to ensure that the expanded school systems provide conditions capable of producing acceptable academic outcomes. Consequently, students' academic performance has become an important measure of whether expansion in secondary education has translated into meaningful learning (Odutuyi, 2015).
In Uganda, the historical development of secondary education has similarly involved a transition from an emphasis on expanding access towards increasing the quality of learning and students' academic performance (Emma and Ounyesiga, 2025). Government interventions, particularly the Universal Secondary Education (USE) programme, significantly expanded opportunities for students to attend secondary school. However, increased access created greater demand for classrooms, laboratories, libraries, sanitation facilities, teachers, instructional materials and other resources required to support effective teaching and learning (Emma and Ounyesiga, 2025).

Academic performance in Uganda has been commonly reflected through students' performance in school assessments and national examinations, particularly the Uganda Certificate of Education (UCE) at the end of lower secondary education (UNEB, 2026). Consequently, examination performance has remained an important concern for government, schools, parents and communities. The Ministry of Education and Sports' Education Statistical Abstract 2025 reports that 358,838 learners registered for UCE in 2024, of whom 357,158 (99.5%) sat the examinations. The statistics illustrate the enormous scale at which academic performance is now used to assess outcomes in Uganda's secondary education system (UNEB, 2025).

The expansion produced substantial increases in secondary enrolment. For example, official statistics show that secondary enrolment increased from 814,087 students in 2006 to 954,328 in 2007 and continued rising to 1,225,692 by 2010 (MoE&S, 2026). The rapid expansion, however, generated challenges for the school environment. The increase in enrolment was not always accompanied by equivalent increases in classrooms, teachers, textbooks and other resources. World Bank (2017) evidence reported that the growth in enrolment after USE placed pressure on infrastructure and contributed to large classes, with some schools experiencing student-teacher ratios of 60 or more. Such conditions raised concerns about the quality of the learning environment and the ability of schools to provide effective instruction (MoE&S, 2010). The secondary schools have increasingly been expected to provide education to larger and more diverse populations while government remains responsible for

the provision of staffing, financing, infrastructure, supervision and quality assurance (MoE&S, 2017).

Examination grades provided a relatively standardised basis for determining students' mastery of curriculum content and progression to higher levels of education. However, academic performance has increasingly been understood more broadly (UNEB, 2026). It may include examination achievement performance in UCE, UACE and school examinations, subject achievement students' grades and scores in individual subjects, mastery of knowledge and skills the extent to which students acquire expected competencies, continuous assessment performance students' performance in tests, assignments and classroom activities, progression and completion whether students successfully progress through secondary education and complete the required cycle, participation and engagement students' involvement in learning activities and application of knowledge the ability to use acquired knowledge and skills in practical and unfamiliar situations (UNEB, 2026). This broader understanding is important because a student may obtain an examination grade without necessarily demonstrating all dimensions of learning. UNEB itself conducts research on educational assessment, including studies concerning students' proficiency and academic performance (Opio et al., 2024).

1.1.2. Theoretical background

This study was informed by Ecological Systems Theory (Bronfenbrenner, 1979). Bronfenbrenner's Ecological Systems Theory argues that human development is influenced by multiple environmental systems that interact with one another. These include the microsystem, mesosystem, exosystem and macrosystem. In this study, the microsystem represents the immediate school environment experienced directly by students. Differences in this environment may contribute to differences in students' academic performance as reflected in UNEB results, project performance and general performance grades.

The mesosystem refers to the relationships and interactions between two or more microsystems in which the student participates. It is therefore not simply the presence of facilities or people, but how different parts of the student's immediate environment work together. The exosystem consists of settings in which the student does not necessarily participate directly but which nevertheless influence the student's experiences and development. The macrosystem is the widest environmental system. It consists of the broader cultural, economic, political, social and policy conditions that shape the other systems. The macrosystem therefore provides the broader context within which schools operate.

The choice of the theory was based on the proposition that students' academic performance is partly shaped by the quality of the immediate school environment and by the interaction between school-level resources and the wider educational systems within which government-aided secondary schools operate.

The theory was appropriate for this study as it recognises the school as an immediate developmental environment in which students spend a significant amount of their educational lives, it explains how physical resources such as laboratories, libraries, classrooms, textbooks and seating can influence students' learning opportunities rather than treating academic performance as solely an individual characteristic and it allows the study to recognise that school facilities do not operate independently. Their availability and utilisation are influenced by school management, government policies, funding and the broader educational system.

Therefore, Bronfenbrenner's Ecological Systems Theory provides a strong theoretical lens for investigating whether differences in the school environment are associated with differences in students' academic performance in government-aided secondary schools. The theory particularly supports the argument that adequate and functional learning environments create opportunities for students to participate in meaningful learning experiences, undertake projects, develop competencies and ultimately achieve better results in UNEB examinations and other measures of academic performance.

1.1.3 Conceptual background

According to Konishi et al. (2017), school environment refers to physical, social and emotional academic factors within a school that collectively influence teaching, learning activities. It includes everything from classroom conditions, teacher-student relationships, policies, facilities (like libraries, labs) and school culture to the broader community context (Konishi et a., 2017). School environment is the total atmosphere and external influences shaping a student's educational experience and development, affecting their academic achievement, attitudes and behaviour (Madudili, 2019). In the view of Han, Moon and Lee (2019), school environment refers to the set of relationships that occur among members of a school community that are determined by structural, personal and functional factors of the educational institution, which provide distinctiveness to schools.

In this study, school environment is conceptualised as number of science laboratories, number of libraries, number classroom facilities, number of textbooks, presence of shades with seats,

presence of talking compounds, presence of school farms and the presence of playgrounds for learners.

According to Narad & Abdulla (2016), student's academic performance is the knowledge gained which is assessed by marks by a teacher and/or educational goals set by students and teachers to be achieved over a specific period of time. Student's academic performance can be understood as the quantifiable and apparent behavior of a student within a definite period and is an aggregate of scores fetched by a scholar in various evaluations through class tests, mid and end term examinations (Yusuf, Onifade and Bello, 2016). Meanwhile Clifton & Anderson (2018) looked at student's academic Performance as progression of the students on academic grounds, to attain completion of degree, regardless of institution related contexts and issues.

This study conceptualised students' academic performance as grade of the student projects and grades at UNEB-UCE.

1.1.4 Contextual background

In Mbale City the expansion of secondary education has increased demand for school facilities, while the ability of individual schools to provide adequate laboratories, libraries, classrooms, textbooks, seats and recreational spaces may vary (United Nations Development Programme, 2017). Two government-aided secondary schools may operate within the same national education system and follow the same curriculum but produce different academic outcomes because the learning environments available to their students differ (Effiong, 2020). One school may have several functional science laboratories, a well-stocked library, adequate classrooms, sufficient textbooks and seats, while another may have inadequate facilities relative to its student population. Such differences can affect the opportunities students have to learn and consequently their academic performance (Wisenbaker, 2023).

The concern was therefore not simply whether a school has a particular facility, but whether the quantity and adequacy of facilities are sufficient to support the number of students enrolled (UNDP, 2017). For example, the presence of one science laboratory in a school with a very large student population may not provide the same learning opportunities as several functional laboratories in a school with a smaller enrolment. The same argument applies to classrooms, libraries, textbooks and seats (World Bank, 2017).

The contextual issue underlying this study was that government-aided secondary schools are expected to provide an environment that enables students to attain satisfactory academic outcomes, yet differences may exist in the availability and adequacy of the facilities that constitute this environment (MoE&S, 2025). Where laboratories, libraries, classrooms, textbooks and seats are inadequate, students may have limited opportunities for practical learning, reading, research, classroom participation and independent study. Where playgrounds and talking compounds are inadequate or poorly managed, opportunities for recreation, social interaction and student wellbeing may also be affected (MoE&S, 2025).

At the same time, academic performance remains a critical concern because students are expected to demonstrate achievement through UNEB examinations, projects and school-based grades (UNEB, 2025). Consequently, the critical contextual question is whether the existing school environment in government-aided secondary schools in Mbale City is sufficiently equipped to support the level of academic performance expected of students (UNEB, 2025).

Although school facilities are generally recognised as important components of educational quality, the availability of a facility did not necessarily mean that it was adequate for the number of students or effectively supports learning. Furthermore, academic performance is sometimes assessed predominantly through examination results, potentially overlooking students' project work and general school performance (MoE&S, 2026).

This study, therefore, contextualised school environment in terms of the number of science laboratories, libraries, classroom facilities, textbooks, playgrounds, talking compounds and seats, while assessing academic performance through UNEB results, students' projects and general performance grades. Focusing specifically on government-aided secondary schools in Mbale City provides an opportunity to establish whether differences in these environmental conditions are associated with differences in students' academic performance.

1.2 Problem statement

Students’ academic performance should be reflected not only in students’ ability to obtain passes in national examinations, but also in their subject achievement, examination scores and grades, continuous assessment, progression, completion and mastery and application of expected learning outcomes (MoE&S, 2017). Government-aided secondary schools are expected to provide a conducive, adequate and functional school environment that enables students to learn effectively and attain satisfactory academic performance (MoE&S, 2025).

A supportive school environment should provide sufficient and functional science laboratories, libraries, classrooms, textbooks, playgrounds, talking compounds and seats commensurate with student enrolment (MoE&S, 2017). Such facilities are expected to provide students with opportunities for practical experimentation, reading, research, classroom interaction, independent study, project work, recreation and effective participation in teaching and learning (MoE&S, 2024). In such an environment, students should be able to demonstrate the knowledge, skills and competencies acquired through good Uganda National Examinations Board (UNEB) results, quality project work and satisfactory general performance grades. Thus, good academic performance should be an important indication that the school environment is effectively supporting teaching and learning (UNEB, 2020).

In practice, however, students' academic performance in some government-aided secondary schools remains a concern despite government efforts to expand access to secondary education and improve school infrastructure and learning resources (MoE&S, 2024). Differences in students' performance in UNEB examinations, school-based assessments and project activities suggest that students may not be benefiting equally from the learning opportunities available in their schools. Some government-aided secondary schools may have inadequate numbers of science laboratories, libraries and classrooms relative to student enrolment, while shortages of textbooks and seats may constrain effective teaching and learning (MoE&S, 2024).

Similarly, inadequate or poorly maintained playgrounds and talking compounds may limit opportunities for recreation, social interaction and students' overall wellbeing. Where students have limited access to functional laboratories, libraries, textbooks and adequate classroom facilities, their opportunities to undertake practical work, conduct research, concentrate during lessons, complete assignments and participate actively in learning may be reduced (MoE&S, 2026). These conditions may subsequently be reflected in poor or inconsistent UNEB results, weak project performance and unsatisfactory general performance grades.

The continued concern about students' academic performance is significant because academic achievement represents one of the principal outcomes expected from secondary education. Poor performance may limit students' progression to higher education, acquisition of relevant competencies and access to future employment opportunities (UNEB, 2024). It may also indicate that the resources invested in secondary education are not being translated adequately into learning outcomes. However, students' academic performance is influenced by several factors, including teacher quality, teaching methods, student motivation, attendance, parental

support, socioeconomic circumstances and school leadership. Consequently, the extent to which the school environment itself contributes to differences in students' academic performance needs to be empirically established rather than assumed.

Although previous studies have examined school facilities and students' academic achievement, much of the available evidence has concentrated on individual components of the school environment, such as classrooms, laboratories, libraries or sanitation, rather than examining the school environment as a broader combination of facilities. In addition, academic performance has often been represented mainly by examination results, with comparatively less attention to a combination of UNEB results, students' project performance and general performance grades. There is also limited context-specific empirical evidence demonstrating how the availability and adequacy of science laboratories, libraries, classroom facilities, textbooks, playgrounds, talking compounds and seats relate to students' academic performance in government-aided secondary schools specifically in Mbale City. Therefore, it remains unclear whether variations in the school environment are associated with variations in students' academic outcomes in this setting.

This study was therefore conducted to fill the contextual, empirical and measurement gaps by examining the relationship between the school environment and students' academic performance in government-aided secondary schools in Mbale City. Specifically, the study considered the availability and adequacy of science laboratories, libraries, classroom facilities, textbooks, playgrounds, talking compounds and seats and related these environmental conditions to students' academic performance as reflected in UNEB results, students' project performance and general performance grades. The findings are expected to provide context-specific evidence to guide school administrators, the Ministry of Education and Sports, Mbale City education authorities and other education stakeholders in identifying environmental conditions that require improvement in order to create learning environments capable of enhancing students' academic performance.

1.3 Objectives of the study

1.3.1 General Objective

The general objective of this study was to assess the relationship between school environment and academic performance of learners in government-aided secondary schools in the Northern Division of Mbale City.

1.3.2 Specific Objectives

1) To examine the nature of school environment in government-aided secondary schools of Northern Division in Mbale city
2) To examine the level of academic performance in government aided secondary schools in Northern Division of Mbale city
3) To determine the relationship between the physical school environment and academic performance in government aided schools of Northern Division in Mbale city

1.3.3. Research Questions

1) What is the nature of school environment is present in the government-aided secondary schools of Northern Division in Mbale city?
2) What is the level of academic performance in the government-aided secondary schools of Northern Division in Mbale city?
3) What is the relation between school environment and academic performance in government aided secondary schools of Northern Division in Mbale city?

1.4 Scope of the Study

1.4.1. Content Scope

The study was limited to examining the impact of the school environment on the level of academic performance of learners. The academic performance was evaluated by analyzing scores obtained at the end of the term for continuous assessment and the National Examination Board results for the last five years (2021 -2025).

1.4.2. Geographical Scope

This study was conducted in all five government-aided secondary schools in the Northern Division of Mbale City. This is because the study was targeting government-aided secondary schools and Northern division has only five government-aided secondary schools. This division has been selected because it has the biggest schools in terms of number of students in Mbale City.

1.4.2 Time Scope

The study data were collected within the years 2021-2025. This was the period when Mbale City became fully operational after Covid-19 and low level of students' academic performance was recorded to be low and no study was conducted on the same.

1.5 Significance of the Study

The results inform local leaders in Mbale City, at the Ministry of Education and Sports and the leaders of these schools on the state of physical infrastructure and how they are impacting the learner's academic performance at different levels of the education cycle.

This study can stimulate parents, school managers, teachers, students and society's awareness of the importance of providing a conducive learning environment in government-aided schools not only in cities but even in rural areas.

The findings of this study may be beneficial to students themselves especially if the policymakers and school leaders take into consideration and implement the recommendations that will be generated.

1.6 Conceptual framework

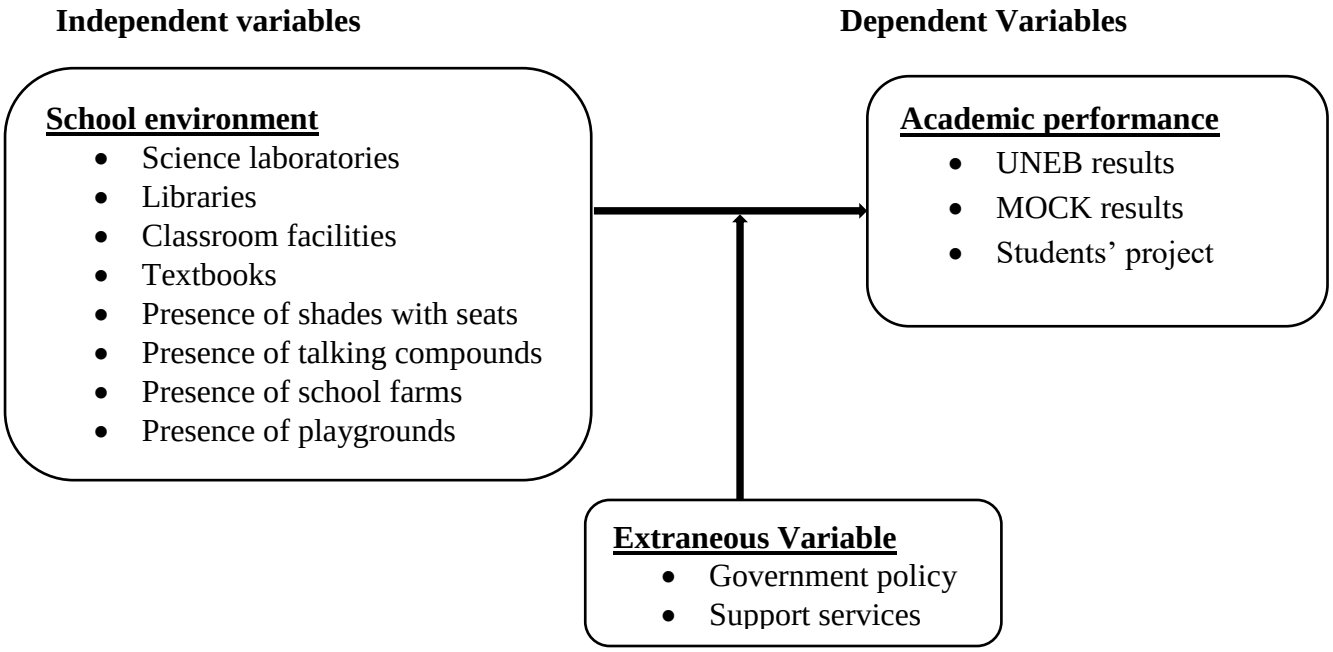


Fig.1. Conceptual framework Showing the Relationship between School Environment and Level of Students' Academic Performance in Government-Aided Secondary Schools in Northern Division, Mbale City.
Source: Primary Data (2025).

The relationship between school environment and students' academic performance is understood from the premise that students learn within a physical and social environment that can either facilitate or constrain their ability to acquire knowledge, develop skills, complete academic tasks and perform well in assessments. In this study, the school environment comprises science laboratories, libraries, classroom facilities, textbooks, playgrounds, talking

compounds and seats, while academic performance is measured using UNEB results, students' projects and general performance grades.

Science laboratories provide students with opportunities to translate theoretical knowledge into practical experience. An adequate number of functional laboratories can enable students to conduct experiments, make observations, manipulate materials and develop problem-solving and practical skills. Where laboratories are inadequate relative to student enrolment, students may have limited opportunities for practical activities. This can result in excessive dependence on theoretical teaching and potentially affect students' ability to perform practical tasks and demonstrate competencies in projects and examinations.

Libraries provide students with opportunities for reading, reference, research and independent learning. A school with adequate library facilities can give students access to additional sources of knowledge beyond classroom instruction. Where libraries are inadequate, students may have fewer opportunities to undertake independent academic research, revise content or consult additional learning materials.

Classrooms are the immediate physical setting for most teaching and learning activities. Adequate classrooms can reduce overcrowding and provide an environment conducive to concentration, teacher student interaction, discussion and participation. In contrast, inadequate classrooms may result in overcrowding, reduced interaction and distractions, which can interfere with effective teaching and learning and consequently affect students' grades and examination performance.

Textbooks provide students with structured curriculum content that can be used during and outside lessons. They support reading, revision, assignment completion, research and preparation for examinations. Textbooks can also support students' projects by providing information needed to investigate topics, develop arguments and complete assignments. Where textbooks are insufficient, several students may have to share one book or depend primarily on teacher-prepared notes, potentially limiting opportunities for independent learning.

Playgrounds contribute to the broader school environment by providing space for physical education, sports and recreation. Although playgrounds do not directly teach academic content, they can contribute indirectly to students' wellbeing, social interaction, physical fitness and engagement with school. The relationship between playgrounds and academic

performance is therefore likely to be indirect, unlike the more direct relationship expected for laboratories, libraries, classrooms and textbooks.

Talking compounds provide spaces where students can interact informally with peers and communicate outside formal classroom settings. When properly managed, these spaces may facilitate social interaction, peer learning, exchange of ideas and students' sense of belonging. However, talking compounds can also become sources of distraction if they are poorly managed. Therefore, their contribution to academic performance may depend on how the school regulates and utilises these spaces.

Adequate seats or desks provide students with the physical support necessary for writing, reading, completing exercises and sitting comfortably during lessons and examinations. Where seats are inadequate, students may share desks excessively or sit in uncomfortable positions, which can interfere with concentration and participation. Consequently, adequate seating may contribute to better classroom performance and, indirectly, examination outcomes.

School environment variable	Main learning mechanism	Expected academic-performance outcome
Science laboratories	Practical experimentation and application	UNEB results, projects, general grades
Libraries	Reading, reference and research	Projects, general grades, UNEB results
Classroom facilities	Concentration, interaction and instruction	General grades and UNEB results
Textbooks	Access to content, revision and independent study	UNEB results, projects, general grades
Playgrounds	Recreation, physical activity and wellbeing	Mainly indirect influence on general performance
Talking compounds	Peer interaction and communication	Engagement and general performance
Seats	Comfort, concentration and participation	General grades and UNEB results

Chapter Two

Literature Review

2.0 Introduction

This chapter reviews existing literature on school infrastructure, learners' academic performance the relationship between school infrastructure and learners' performance.

2.1. Theoretical Review

Systems Theory (Ludwig von Bertalanffy, 1968).

Systems Theory views an organisation as a set of interrelated and interdependent components that work together toward common goals. Applied to a school, the institution can be viewed as a system comprising students, teachers, administrators, infrastructure, learning materials, policies and the surrounding community.

The theory is relevant because the school environment consists of interconnected elements such as classroom conditions, teacher-student relationships, school leadership, sanitation, safety, teaching and learning resources and physical facilities. A weakness in one component can affect other components and ultimately influence students' academic performance. For example, inadequate classrooms or instructional materials may affect teaching effectiveness, which may subsequently affect students' learning outcomes.

The theory assumes that improvements in the school environment—such as adequate facilities, supportive teacher-student relationships, effective administration and availability of learning resources can contribute to improved academic performance because these components interact to support the educational process.

Ecological Systems Theory (Bronfenbrenner, 1979)

Bronfenbrenner's Ecological Systems Theory argues that human development is influenced by multiple environmental systems that interact with one another. These include the microsystem, mesosystem, exosystem and macrosystem.

The theory is particularly relevant to students because the school constitutes an important part of the student's immediate environment (microsystem). Relationships with teachers, peers and school administrators can influence students' learning experiences. The interaction between school and home also constitutes an important mesosystem relationship.

The theory helps explain why students' academic performance cannot be understood solely in terms of individual ability. Their performance may be influenced by classroom conditions, teacher support, peer relationships, school safety, school-home relationships and broader educational policies.

Social Learning Theory (Albert Bandura, 1977)

Social Learning Theory proposes that people learn through observation, imitation and interaction with others, with behaviour influenced by environmental factors and personal characteristics.

This theory is relevant because students spend substantial time interacting with teachers and peers within the school environment. Teachers' behaviours, attitudes, teaching practices and expectations can provide models that students observe and emulate. Similarly, peer behaviour can influence students' attitudes toward learning, attendance, discipline and academic achievement.

A supportive school environment in which teachers demonstrate commitment to teaching, encourage students and reinforce positive academic behaviours may promote learning. Conversely, negative peer influence, teacher absenteeism or an unsupportive school climate may undermine students' engagement with learning.

2.3.1. Physical School environment in Secondary Schools.

Globally, a conducive school environment is increasingly understood as more than the existence of school buildings but it includes adequate classrooms, laboratories, libraries, textbooks, furniture, grounds and other facilities that enable teachers to provide effective instruction and students to participate actively in learning (OECD, 2019). OECD (2020) evidence indicates that educational materials such as textbooks, library and laboratory materials, together with physical infrastructure such as buildings, instructional spaces and school grounds, are important components of a quality learning environment. However, their influence depends on their availability, quantity, quality and equitable distribution as the global evidence suggests that schools may have facilities but still experience an inadequate environment when the facilities are insufficient, poor quality, inaccessible or poorly utilised (UNESCO, 2024). The research gap is that much global evidence aggregates school resources into broad indices of infrastructure or material shortages, giving less attention to the specific combination of laboratories, libraries, classrooms, textbooks, playgrounds, talking

compounds and seats that characterises the school environment in particular government-aided secondary schools. This content gap justified examining the nature of these specific facilities in this study.

In the United States, school environments generally have relatively developed physical infrastructure, but significant differences remain in the condition and adequacy of school facilities (Warner, 2018). The U.S. Government Accountability Office reported in early 2026 that 47% of school districts experienced chronic facility problems in 2024–25, with facility problems contributing to school cancellations and loss of learning days. Similarly, the National Center for Education Statistics recognises school facilities as important settings for learning, health and comfort (Teachmint, 2020). Thus, the U.S. experience demonstrates that the nature of a school environment is not determined simply by whether facilities exist, but also by their physical condition, functionality and ability to support instruction (Warner, 2018). Much U.S. evidence concentrates on building condition, maintenance and infrastructure inequality. Less attention is given to the combined influence of specific facilities such as laboratories, libraries, textbooks, playgrounds, talking compounds and seating on students' overall academic performance. This creates a contextual gap for studies in developing-country government-aided schools.

In Latin America and the Caribbean countries, school environments show considerable inequalities in infrastructure and learning resources (Entwisle, 2018). UNESCO (2024) and the Inter-American Development Bank found substantial differences among and within countries in access to basic school infrastructure, particularly between urban and rural schools and between schools serving higher- and lower-income communities. Infrastructure characteristics associated with learning included libraries, science laboratories, computer rooms and basic services (Warner, 2018). The finding, therefore, demonstrates that the school environment is characterised by unequal availability and quality of learning spaces and resources and UNESCO further noted limitations in available data because much information concerns only whether facilities are present, without adequately capturing their quality, use and users' perceptions (UNESCO, 2024). Latin American studies have largely focused on infrastructure sufficiency and inequality, with less evidence on how a broader school environment including learning spaces, textbooks, seating and recreational/social spaces operates together in secondary schools. This contextual gap supported a more comprehensive examination in Mbale City.

In Canada there is a comparatively well-resourced school environment, although material and physical-resource shortages have not been eliminated (Cakir, 2018). PISA 2025 reported that 18% of Canadian students were in schools where principals indicated that inadequate educational materials, including textbooks, library or laboratory materials hindered instruction to some extent, while 24% were in schools where physical infrastructure posed some hindrance (Wisenbaker, 2023). The Canadian finding shows that even relatively well-resourced education systems need to maintain adequate and functional learning environments and the issue is not merely provision but also quality, adequacy and changing educational needs. Findings in Canadian revealed useful information about material and infrastructure shortages but provided the context of a high-income education system with limited explanation of how specific physical and instructional resources operate within resource-constrained government-aided secondary schools in Uganda, thus leaving a contextual gap.

In the UK, particularly England, considerable attention is given to the physical condition, maintenance and suitability of school buildings. The Department for Education's current estate strategy recognises that poor school-building conditions can negatively affect attainment and that the physical environment can influence students' wellbeing and engagement (Waxman, 2018). The government is also undertaking systematic condition surveys of government-funded schools to identify deterioration and guide maintenance and investment. Further finding shows that the physical condition of classrooms affect teachers' ability to teach, while the design and condition of school spaces influence pupil behaviour (Waxman, 2018). The UK studies and policy assessments tend to emphasise building condition, safety, maintenance and wellbeing rather than examining the combined availability and adequacy of laboratories, libraries, textbooks, classrooms, playgrounds, talking compounds and seats in relation to academic performance. This provided a content and contextual gaps for this study in Mbale City. The evidence was also based on a substantially different resource and governance

Wang and Chen (2025) reported that in China there is substantial investment in school infrastructure and educational resources, but inequalities in the distribution of school resources remain. OECD analysis identifies infrastructure, facilities, educational materials and technological equipment as important dimensions of China's learning environment and notes socioeconomic differences in physical infrastructure. More recent PISA 2025 evidence from Beijing, Shanghai, Jiangsu and Zhejiang indicates that 26% of students were in schools where principals reported that shortages of educational materials hindered instruction, while

29% were in schools where physical infrastructure was reported as a hindrance (Wang and Chen, 2025). Above finding demonstrates that even rapidly developing education systems continue to experience differences in the adequacy of school resources. However, most studies focus on broad infrastructure and resource indicators rather than the specific combination of facilities proposed in this study. Furthermore, the Chinese context differs substantially from government-aided secondary education in Uganda.

In Eastern Europe and Central Asia, school environments vary considerably across countries as OECD evidence shows that schools experience shortages or inadequacies in physical infrastructure, instructional space, textbooks, laboratory equipment, instructional materials and computers, although the magnitude differs between countries (Saeed and Wain, 2019). The evidence also indicates that outdated infrastructure and low-quality textbooks can obstruct effective teaching and learning (Saeed and Wain, 2019). Findings above largely examined school resourcing at national or system level and there is comparatively less attention to how specific physical and instructional facilities combine to constitute the everyday school environment experienced by students in individual government-funded secondary schools. This limits direct applicability to the Ugandan context.

According to Owoeye and Yara (2018), in Sub-Saharan Africa the nature of the school environment remains strongly affected by inadequate infrastructure and learning resources. The World Bank reports that although the region has expanded access to primary and lower-secondary education, learning levels remain low, indicating that access alone has not guaranteed effective learning. UNESCO also reports persistent deficiencies in school infrastructure and safe, supportive learning environments, particularly in low-income settings (Arul, 2015). The African context is therefore characterised by challenges involving overcrowded classrooms, inadequate laboratories and libraries, shortages of textbooks and furniture, and insufficient or poorly maintained school facilities and these conditions restrict practical learning, reading, individual study, classroom participation and effective teaching (Owoeye and Yara, 2018). As seen above, much findings from Sub-Saharan African concentrated on broad infrastructure shortages or individual facilities. There is still insufficient empirical evidence examining the combined nature of laboratories, libraries, classrooms, textbooks, playgrounds, talking compounds and seats as dimensions of the school environment in government-aided secondary schools. This content gap provided a strong basis for country-specific investigation in Mbale city.

In Uganda, government investment in secondary education has expanded access, but the adequacy and distribution of school facilities remain important concerns (Nsigo et al., 2026). Evidence from Tororo, for example, indicates that although government supports the provision of classrooms, libraries and laboratories, some schools continue to experience overcrowded classrooms, poor ventilation and inadequate desks, with implications for teaching and learning (Naiggaga, 2019). Earlier research in Mbale District also identified deficiencies in science laboratories, inadequate and poorly equipped libraries, inadequate classrooms and overcrowding. The study concluded that the availability and effective management of school facilities were important for the teaching-learning process and academic performance (Emma and Ounyesiga, 2025). Findings from Uganda align with this study objective, however, it examined selected components of the school environment; libraries, sanitation, classrooms, or physical infrastructure, thereby, leaving content gap for this study to have been conducted in Mbale city which looked at textbooks, playgrounds and talking compounds and nature of these facilities together rather than treating them as isolated infrastructure categories.

2.3.2. Level of Academic Performance in Secondary Schools

Globally, students' academic performance is commonly assessed through achievement in standardised examinations, classroom assessments, projects and competency-based tasks (Bakari et al., 2020). However, performance varies considerably across education systems. PISA 2022, for example, reported large differences among participating countries in mathematics, reading and science. The OECD (2026) average scores were 472 in mathematics, 476 in reading and 485 in science, while approximately one-quarter of students across OECD countries were low performers in mathematics, reading and science. The assessment also showed substantial differences between high- and low-performing students within countries and this suggests that although many education systems have expanded access to secondary education, high enrolment does not automatically translate into high academic achievement (Ballotpedia, 2023). This created the need for contextual study at lower geographical levels in secondary schools in Mbale city.

In the United States, students generally demonstrate relatively strong performance compared with many education systems, although performance is not uniform. In PISA 2022, U.S. students scored 458 in mathematics, 504 in reading and 499 in science, with mathematics performance below the OECD average while reading and science were above the OECD average (OECD, 2019). The results demonstrate that academic performance can be strong in

some domains and weaker in others, rather than being uniformly high across the curriculum. Differences also exist according to students' socioeconomic backgrounds and school contexts (OECD, 2020). U.S. studies provide extensive national and state-level assessment data, but such evidence is situated in a substantially different education and resource environment from Uganda. Moreover, less attention is given to the combined measurement of national examination results, projects and general school grades as indicators of academic performance in government-aided schools.

Latin American countries generally show greater variation in students' academic achievement than the highest-performing education systems. PISA 2022 results illustrate this variation: for example, mathematics scores were 378 in Colombia, 383 in Brazil, 403 in Uruguay, 412 in Mexico and 435 in Chile, all below the OECD average of 472. Reading and science performance similarly varied across the region (OECD, 2026). Findings above indicate that substantial proportions of students struggle to reach basic levels of proficiency, although some countries have made progress, thus, academic performance in Latin America can be described as uneven, with significant differences between countries, schools and student groups (World Bank, 2017). Evidence above resonates with this study objective, however, it focused on standardised tests such as PISA and therefore captures cognitive achievement mainly through examinations. There is less emphasis on students' project performance and routine/general grades, which may provide additional evidence of students' application of knowledge and continuous learning. This gap supports broader measurement of academic performance.

Canada is among the relatively high-performing education systems (Lamas, 2015) (Ballotpedia, 2023). In PISA 2022, Canadian students scored 497 in mathematics, 507 in reading and 515 in science, placing Canada above the OECD average in all three areas and among the education systems identified as combining relatively high performance with comparatively high educational equity (Ballotpedia, 2023). According to Louis (2012), the decline in mathematics performance between 2018 and 2022 shows that even high-performing systems can experience challenges. Findings above align with this study objective as its evidence demonstrates generally high academic achievement but provides limited insight into academic performance under the conditions of resource-constrained government-aided secondary schools in developing countries. It also tends to rely heavily on standardised assessment rather than the combined indicators proposed for the present study.

Students in the United Kingdom performed above the OECD average in mathematics, reading and science in PISA 2022. About 76% of UK students attained at least Level 2 proficiency in

mathematics, compared with an OECD average of 69% (OECD, 2026). However, mathematics and reading performance declined compared with 2018, while science performance remained approximately unchanged (OECD, 2019). In the view of OECD (2026), the UK demonstrates that even relatively high-performing education systems can experience declining achievement and differences between high- and low-performing learners. The UK evidence is dominated by national assessment and international comparative testing. There is less direct applicability to understanding performance patterns in government-aided secondary schools in Uganda, where examination results, projects and continuous school grades may be shaped by very different resource and institutional conditions.

China's participating education systems have historically demonstrated very high academic performance, particularly in mathematics, reading and science (Tian and Sun, 2018). In PISA 2022, Hong Kong, Macao and other Chinese participating systems were among the highest-performing systems in mathematics, while Hong Kong and Macao also performed strongly in reading and science (Wang and Chen, 2025). This demonstrates that students can achieve exceptionally high academic outcomes where education systems place strong emphasis on learning, assessment and academic achievement (Tian and Sun, 2018). Findings from China mainly reflects highly developed education systems with distinctive examination cultures, teacher preparation and resource structures. It therefore cannot adequately explain the level of academic performance among students in government-aided secondary schools in Uganda, where access to learning resources and school conditions may differ considerably.

Eastern European education systems demonstrate considerable variation in academic achievement and PISA 2022, for example, shows differences between countries such as Poland, Czechia (Lodhi et al., 2019). Hungary, Serbia and other participating systems performed above the OECD average in particular domains, while others remained below it (OECD, 2026). In the view of OECD (2020), the regional pattern indicates that academic performance is not uniform even among countries with relatively similar geographical and historical backgrounds in Eastern Europe. Findings above generated much of the evidence through cross-national standardised assessments. There remains insufficient evidence concerning the school-level nature of academic performance, particularly performance that combines examination results with project work and general grades. This limits direct understanding of students' broader academic achievement.

In Sub-Saharan Africa, the challenge is more pronounced because expansion of access to secondary education has not always been accompanied by equivalent improvements in learning outcomes (Kuwornu et al., 2018). The World Bank has characterised the region's education challenge as moving beyond schooling access toward ensuring that students actually acquire foundational knowledge and skills as the region continues to face concerns about low learning achievement, examination performance and disparities between schools and learners (Madudili, C. G. 2019). Academic performance is often characterised by wide differences among schools, weak mastery of foundational competencies, examination failures and relatively small proportions of learners attaining high levels of achievement (World Bank, 2017). Findings above examined examination performance or learning achievement in isolation. Less empirical attention has been given to measuring academic performance through UNEB-type national examination results, project performance and general school grades simultaneously, particularly in government-aided secondary schools. This creates the need for country-specific and school-level investigations.

In Uganda, academic performance at secondary level is primarily reflected through UCE results, classroom assessment, projects and other school-based evaluations. The 2024 UCE examinations were conducted during the transition to the new Lower Secondary Curriculum and introduced a revised competency-oriented assessment system (UNEB, 20224). Nationally, 350,146 candidates, representing 98.05% of candidates who sat the examination, qualified for the UCE certificate by attaining at least Grade D in one subject (MoE&S, 2025). However, the new system means that this figure should not be interpreted simply as 98% achieving high academic performance; qualification for a certificate is different from attaining strong performance across subjects (UNEB, 2024).

According to Ministry of Education and Sports (MoE&S, 2026), the transitional UCE results further demonstrate substantial differences in achievement levels. Among transitional candidates, only 0.8% obtained Division 1 and 5.2% Division 2, while 17.6% obtained Division 3 and 59.7% Division 4; 16.7% were ungraded. This suggests that although many learners may technically qualify for certification, high-level academic achievement remains much more limited. Findings in Ugandan have largely investigated factors such as guidance services, parental participation, drug abuse and selected physical infrastructure in relation to academic achievement. However, there was need to establish the actual level of students' academic performance across government-aided secondary schools in Mbale City using

multiple indicators UNEB results, students' project performance and general performance grades rather than relying predominantly on examination results alone.

2.3.4. Relationship between physical school infrastructure and academic performance

Daily et al. (2019) reported positive relationship between school resources and the broader learning environment and student achievement. PISA (2022) consents that educational materials including textbooks, library and laboratory materials and physical infrastructure, school buildings and grounds as important dimensions of the learning environment. Across participating systems, students in schools with fewer shortages of educational materials tended to perform better in mathematics before socioeconomic factors were controlled for. In the view of Darling-Hammond and Cook-Harvey (2018), the relationship between school environment and students' academic performance is not direct or automatic because after controlling for the socioeconomic characteristics of students and schools, the relationship between material shortages and mathematics performance becomes statistically insignificant in many systems. This suggests that school environment interacts with other factors such as socioeconomic background, school management and student characteristics (Darling-Hammond and Cook-Harvey, 2018). The global studies established that school resources and learning environments is associated with academic achievement, but much of the evidence is based on broad international indicators and standardised tests. There was limited evidence on the combined relationship between laboratories, libraries, classrooms, textbooks, playgrounds, talking compounds and seats and multiple measures of academic performance. This provided the first rationale for this study to be conducted in Mbale city.

Villegas (2021) reported that in the United States, school environment is generally characterised by relatively developed physical infrastructure and extensive instructional resources, however, differences in school facilities and learning conditions continue to exist between schools. The U.S. experience suggests that the presence of facilities alone does not guarantee high achievement as their quality, accessibility, effective utilisation and the learning practices occurring within them are important. For example, a laboratory that exists but is poorly equipped or rarely used may contribute little to students' practical learning (Alam, 2022). Findings from the U.S. was generated from a comparatively resource-rich education system and, therefore, provides limited explanation of how shortages or inadequacies of basic facilities affect students' academic performance in resource-constrained government-aided schools. This study, therefore, sought evidence under the government-aided secondary schools in Mbale city, Ugandan context.

Muller, C., & Kerbow, D. (2018) reported that in Latin America there is stronger connection between school infrastructure and learning. A comparative UNESCO–Inter-American Development Bank (2024) study covering 15 countries examined the relationship between school infrastructure and student learning and identified sufficiency, equity and effectiveness as important dimensions of school infrastructure. It reported that significant numbers of students, particularly those from poorer and rural communities, lacked access to basic infrastructure. Meanwhile, Ressa and Andrews (2022) argued that inadequate classrooms, learning spaces and other infrastructure constrain the learning opportunities available to students and conversely, adequate infrastructure can create conditions conducive to learning. Findings from the Latin American resonate with this study objective, however, the studies primarily examined broad infrastructure and learning outcomes with less evidence about the simultaneous relationship of specific instructional facilities, furniture, recreational spaces and informal social spaces with different measures of academic performance. Thus, there was need to investigate the relationship using more specific school-environment indicators.

Fisher et al. (2018) argued that Canada provides an example of a relatively high-performing education system in which school resources and learning conditions are generally adequate as PISA evidence shows that Canadian schools report relatively low levels of shortages of educational materials and infrastructure compared with many participating systems. The Canadian context illustrates an important point: adequate resources create favourable conditions for learning, but academic performance is also influenced by factors beyond physical facilities, including teaching quality, student characteristics and school climate (Nguyen, Yuan and McNeeley, 2020). Findings from Canada provide limited insight into the relationship between school environment and academic performance in settings where schools may face shortages of basic textbooks, laboratory facilities, classrooms and furniture. The socioeconomic and institutional differences between Canada and Uganda, therefore, created a contextual gap for this study.

Owens and Candipan (2019) reported that in the UK, school environment encompasses the quality of school buildings, classrooms, learning spaces, educational resources and the social climate within schools. Similarly, OECD (2026) report indicates that school climate, safety, teacher support and learning conditions are important aspects of the environment within which students learn and encompassing the relationships, shared norms and the general atmosphere of school life. The implication is that academic performance is likely to be better where students experience a school environment that supports concentration, participation,

safety, interaction and access to learning resources (Owens and Candipan, 2019). UK research and assessment systems operate within a comparatively well-developed educational infrastructure. Consequently, they provide limited empirical explanation of how basic shortages of laboratories, libraries, classrooms, textbooks and seats may affect achievement in government-aided secondary schools in Uganda.

Han, Moon and Lee (2019) argued that the context of China provides contrasting perspective several Chinese education systems have achieved high levels of academic performance. The Chinese experience demonstrates that academic achievement is highly associated with a combination of adequate educational resources, strong school organisation, intensive learning opportunities and supportive learning environments. School organisation, teaching practices, student effort and educational expectations also contribute to achievement and the broader framework similarly treats tangible resources, school management, curriculum organisation and positive school climate as interconnected elements of school effectiveness (Han, Moon and Lee, 2019). Studies of the Chinese evidence comes from a substantially different educational, cultural and resource context. It therefore provides limited evidence about how the availability and functionality of basic school facilities relate to academic performance in government-aided secondary schools in Uganda.

In the view of Cepada and Grepon (2020), the broader international evidence indicates that schools' instructional materials, physical infrastructure and learning conditions can contribute to differences in learning opportunities and outcomes. Furthermore, Cepada and Crepon (2020) argued that the relationship between school environment and students' academic performance is relevant where shortages of textbooks, laboratory materials, learning spaces or other facilities limit teachers' ability to provide effective instruction. Cepada and Grepon's findings focused on national or system-level comparisons rather than examining the relationship between a comprehensive set of school-environment characteristics and students' academic performance at individual-school level. Moreover, these countries in Eastern Europe differ considerably from Uganda in terms of education financing and school infrastructure.

Madudili (2019) reported that there is significant relation between school environment and academic performance in Sub-Saharan Africa because many education systems have expanded enrolment faster than they have expanded adequate learning infrastructure. Though there are still other schools which may still experience overcrowded classrooms, inadequate textbooks, limited laboratory facilities, insufficient furniture and inadequate learning spaces

(Madudili, 2019. The relationship remains influenced by how the school environment (facilities) are managed and utilised (Odutuyi, 2015). African studies investigated individual aspects such as classrooms, laboratories, textbooks or school infrastructure and there is comparatively less evidence examining the combined relationship between the complete school environment and students' academic performance, particularly using examination results, projects and general grades simultaneously.

Research by Earthman (2017) synthesised findings from over 200 studies and concluded that substandard physical conditions, including poor air quality, inadequate lighting, and dilapidated furniture, consistently reduced student academic performance by an estimated 5-17%. In sub-Saharan Africa, studies by Ramadhan et al. (2023) in Nigeria and Okello and Tumwebaze (2019) in Uganda found that students in schools with adequate facilities and sanitation outperformed those in schools with deficient physical environments on standardised assessments. Findings above examined selected aspects of the school environment, but the relationship between the broader school environment and students' academic performance has not been sufficiently established using the specific combination of facilities and performance indicators proposed in this study, hence, leaving the content gap for this study.

In West Africa, Kazaara & Kazaara (2025) established that teacher qualification and instructional expertise were among the strongest predictors of student achievement across school systems. In Uganda, studies by Ssekamwa (2019) found that teacher absenteeism and poor pedagogical practices were significant constraints on student performance in secondary schools, particularly in government-aided institutions. Findings by Kazaara and Kazaara (2025) and Ssekamwa (2019) showed that educational materials and school infrastructure are associated with performance in many contexts, but some associations diminish after socioeconomic characteristics are controlled. This study was, therefore, meant established relationships between selected facilities and academic achievement, but have not adequately addressed the combined relationship of laboratories, libraries, classrooms, textbooks, playgrounds, talking compounds and seats with UNEB results, project performance and general performance grades.

In Uganda, the relationship between school environment and academic performance has received increasing attention as the expansion of secondary education has increased demand for classrooms, laboratories, libraries, textbooks, furniture and other learning facilities (Frank et al., 2023). However, differences in the availability and adequacy of these resources remain

important (Frank et al., 2023). Nsigo et al. (2026) conducted a study on selected public secondary schools in Mbale found a positive correlation between the presence of libraries and students' academic achievement and the study found a positive and stronger relationship between sanitation and achievement, while classroom facilities were also examined as contributors to achievement. Similarly, international evidence indicates that educational materials such as textbooks, libraries and laboratory materials are related to learning opportunities, although the strength of the relationship changes after socioeconomic characteristics are considered (OECD, 2020). Although existing Ugandan and Mbale studies provide evidence that selected school facilities are associated with academic achievement, they tend to examine individual or selected components of the school environment. For example, the Mbale study examined library, sanitation and classroom facilities. There remains insufficient evidence on the relationship between the broader combination of science laboratories, libraries, classroom facilities, textbooks, playgrounds, talking compounds and seats and academic performance measured through UNEB results, students' projects and general performance grades.

2.4. Research Gaps

Existing literature generally acknowledges that the physical school environment including classrooms, laboratories, libraries, sanitation facilities, furniture, lighting, ventilation, recreational facilities and the general safety and cleanliness of the school can influence students' learning experiences. However, much of the available literature tends to discuss school infrastructure broadly without providing sufficient empirical evidence on the actual condition and adequacy of physical learning environments in government-aided secondary schools specifically in Northern Division of Mbale City. There was therefore a contextual gap, because findings from other districts, cities, countries, or private schools cannot automatically be generalized to government-aided schools in Northern Division. Schools operate under different funding arrangements, student populations, infrastructure pressures, and administrative circumstances. In addition, urban schools may experience particular challenges such as overcrowding, pressure on existing facilities, inadequate classroom space, and deterioration of infrastructure resulting from high student enrolment. What remained insufficiently established was the extent to which these physical facilities were adequate, accessible, safe, and conducive to learning in the specific study area. There was also a descriptive gap concerning which components of the physical school environment were relatively adequate and which were deficient. For instance, a school may have adequate

classrooms but inadequate laboratory facilities, sanitation, furniture, lighting, or library resources. Examining the nature of the physical environment therefore provided empirical evidence on the specific strengths and weaknesses of school infrastructure in Northern Division.

Although academic performance is commonly used as an indicator of educational effectiveness, there was inadequate localized evidence establishing the level and pattern of students' academic performance in government-aided secondary schools within Northern Division. A contextual gap existed because academic performance differs across schools and geographical contexts depending on factors such as teacher availability, student characteristics, school leadership, instructional resources, parental support, and learning conditions. Consequently, evidence obtained from other parts of Uganda could not adequately explain the academic performance situation in Northern Division of Mbale City.

There was also a measurement gap. Academic performance is sometimes discussed in general terms such as "good" or "poor" performance without systematically examining the indicators that demonstrate students' achievement. The study was therefore necessary to establish the prevailing level of students' academic performance and provide empirical evidence that could be compared with the observed physical conditions of the schools.

Although previous studies have generally suggested that conducive physical environments can enhance teaching and learning, the existing evidence does not necessarily establish a consistent relationship across all contexts. Some studies report positive associations between adequate school facilities and academic achievement, while others suggest that infrastructure alone may not significantly determine academic outcomes because performance is also influenced by teacher quality, school leadership, student motivation, socioeconomic circumstances, parental involvement, and instructional practices. Thus, a knowledge gap existed regarding whether, and to what extent, the physical school environment was actually associated with students' academic performance in government-aided secondary schools in Northern Division.

The presence of classrooms, laboratories, libraries, sanitation facilities, furniture, and other infrastructure does not automatically demonstrate that these facilities contribute to better academic outcomes. Empirical testing was therefore required rather than relying on assumptions. There was also a geographical/contextual gap, since studies conducted in other regions of Uganda or outside Uganda may have produced findings that are not directly

applicable to Northern Division of Mbale City. The unique socioeconomic, demographic, administrative and infrastructural circumstances of the area created a need for localized evidence.

Chapter Three

Methodology

3.0 Introduction

This chapter presents the research design, study population, sample size and method, sources of data, data collection tools and procedures.

3.1 Research Orientation

This study was oriented to quantitative method. Research orientation refers to the overall philosophical or methodological direction that guides how a researcher understands reality, generates knowledge, collects data, and analyses evidence (Creswell and Creswell, 2018). Quantitative was preferred because it made the researcher to rely on numerical measurements and standardized procedures, which reduced subjective interpretation by the researcher.

3.2. Research Design

This study used correlational design. Correlational research design is a non-experimental, quantitative method that measures the statistical relationship between two or more naturally occurring variables (Tan, 2014). According to Creswell and Creswell (2018), research design is a plan for conducting research that involves decisions about the overall approach and specific procedures for collecting and analysing data. Kothari (2004) describes research design as the arrangement of conditions for collecting and analysing data in a manner that seeks to achieve the research purpose efficiently. This design was preferred as this study was dealing with the relationship between variables. Statistical techniques such as Pearson's correlation coefficient (r) can indicate whether the relationship is positive, negative or weak/strong. The study adopted a correlational research design because it sought to establish the relationship between school environment and students' academic performance in government-aided secondary schools. The design was appropriate because the study variables were measured as they naturally occurred without manipulation by the researcher. It enabled the researcher to determine the direction and strength of the relationship between community participation and school development using appropriate statistical techniques such as Pearson's correlation coefficient. The design also provided an opportunity to use regression analysis to establish the extent to which community participation statistically predicts variations in school development.

3.3. Study Population

This study population was composed of head teachers, PTA members, District Education Department personnel and secondary learners from secondary schools in Mbale City. These were chosen because they provided richer information for the study.

3.3 Sample Size and Sample Selection

3.3.1 Sample Size

This study sample size was 120 respondents which consisted of 10 PTA executives, five head teachers, 100 learners from senior four and five education personnel from office of Mbale city education office. The total sample size was arrived at using Krejcie and Morgan (1970) table of sample size determination as shown in table below.

Table 1: Showing Sample Size of Study Population.

Category of respondents	**Population**	**Sample**	**Sampling technique**
PTA members	40	10	Purposive sampling
Secondary learners	200	100	Simple random sampling
District education department	10	5	Purposive sampling
Head teachers and teachers	10	5	Purposive sampling
Total	**260**	**120**	

Source: Krejcie & Morgan (1970)

3.3.2 Sampling technique and procedure

According to Bodnar et al., (2013), sampling is the technique of choosing a representative segment of a population to establish the characteristics of the entire population. The researcher uses both simple random sampling and purposive sampling techniques while selecting the target respondents. Purposive sampling is a non-probability sampling technique in which the researcher deliberately selects participants or cases because they possess particular characteristics, knowledge, experiences or information that are relevant to the objectives of the study (Saunders, Lewis, & Thornhill, 2019). Palinkas et al. (2015) explain that purposeful sampling is widely used to identify and select information-rich cases related to the phenomenon under investigation. According to Creswell and Creswell (2018), random sampling involves selecting individuals from a population in such a way that each individual has an equal probability of being selected. Similarly, Saunders, Lewis, and Thornhill (2019) describe probability sampling as a procedure in which the probability of each case being

selected is known, with simple random sampling giving each member of the population an equal chance of selection. These techniques were applied to all the respondents of the study to purposely select those with the required information. These techniques was used because it ensured that only those with the relevant information were selected.

3.4 Data Collection Techniques

The data of this study were collected using questionnaire survey.

3.4.1. Questionnaires Survey. The study used questionnaire surveys to collect data from PTA executives, learners, City Education Officer, City Inspector Schools, school directors, Head teachers and teachers and is considered appropriate because of its efficiency for a large sample that other techniques may not be able to cover effectively (Kaplan and Maxwell, 2019). Kaplan and Maxwell (2019) asserted that questionnaire surveys help in achieving uniformity, stability and consistency in facts and information.

3.5. Data Collection Method

This study used questionnaires to collect the research data.

3.5.1. Questionnaires. This questionnaires will be with closed ended questions divided into sections: Section A on background information that require respondents to tick the most appropriate item that relates to them, section B on management strategies used by private secondary schools which requires respondents to tick the most appropriate level of their agreement or disagreement with the statements using five points Likert Scale to obtain immediate feedback.

3.7 Quality Control

3.7.1 Data Reliability

Reliability is the extent to which results are consistent over time and accurately representative of the total population, it is the consistency of research results if is repeated at different times the same results are obtained Kothari (2008). The researcher used simple language and clear instructions which are quite appropriate to the respondents. Instructions were made as simple and clear as possible. Questions were phrased clearly to ensure consistence in responses of the respondents.

Reliability Statistics

Cronbach's Alpha	N of Items
.634	*2*

The reliability statistics show a Cronbach's Alpha of .634 for the two items measured in the study. Cronbach's Alpha is a measure of internal consistency, which indicates how well the items in a scale measure the same underlying construct. A value of 0.634 falls within the moderate reliability range. This means the two items are reasonably related to each other and measure the same concept to a fair extent, but the scale is not highly consistent.

3.7.2 Data Validity

Validity is the degree to which the tool measures what it claims to measure. To establish validity of the questionnaires and interview guide, pre-testing were done amongst selected respondents and fellow students by asking them to read through the questionnaires and answer them which enabled the researcher eliminate ambiguities. Then later, seek permission for final approval of the research instruments from the supervisor before going to the field.

3.8 Procedure of data collection

An introductory letter was obtained from the Department of Education Gulu University and this enabled the researcher to enter the field to gather the relevant data from various respondents from the various schools selected regarding the study topic under investigation.

3.9 Data analysis and Presentation

Data analysis refers to the process of revealing and comprehending the gathered raw data to derive its meaning and outline (Gao & Jacobson, 2016). This study collected numerical data. The data were collected, sorted, edited, coded and tabulated in the data processing exercise. This was done to check the completed responses with a purpose of detecting and eliminating errors and identifying vital information that were essential in coding and tabulating. This involved mainly the use of simple statistical techniques like use of tables, percentages to test the significance of the information from which meaningful information were drawn.

Frequency tables, graphs and charts aided in presenting the collected data so as to make it summarized and more understandable using statistical packages like Microsoft Excel. Frequencies and percentages wer also used in tabulation to portray statistics used to analyze and interpret the findings of the study.

Analysis of quantitative data were done through the use of descriptive statistical methods of frequency distribution and tabulation. Frequencies and percentages were used in tabulation to

portray statistics used to analyze and interpret the findings of the study. SPSS version 16 was used in analysis of data.

In analyzing qualitative data, when the process of data collection is over, raw data were transcribed from audio format to text format and checked and subjected to inductive thematic data analysis to build patterns, categories and themes based on the objectives/questions. Common themes were identified by searching for keywords or phrases and grouping them into categories and sub-categories.

In reporting the information collected, some direct quotations and verbal responses from participants were used as recorded. The researcher also made comments on the response from participants which backed up by literature reviewed in chapter two while codes were used to

3.10. Ethical considerations

The protection of study participants' rights, the development of their sense of reliability and the advancement of research integrity are all aided by ethical considerations (Emong, 2014). Ethical consideration for this study were;
Research ethical considerations were adhered to at all times during the research study in order to maintain credibility and authenticity, paying special attention to consent and information confidentiality in order to safeguard participants' reputations. In an effort to uphold these ethics, participants were informed of the study's objective, duration and intended use.

Permission to undertake the study was obtained from the school authorities directing participants to provide the necessary assistance which eased with the introductory letter signed with a stamp.

Care was taken to ensure that all those who accept to participate do so voluntarily because it was by choice and should give their consent.

Participants' identities and responses to the interview were strictly kept confidential and only be used for the purpose of the study.

The data collected were done one on one and not revealing it to any other person, the audios and questionnaires taken were kept jealously with backups.

3.11. Limitations and of the study

Financial constraints, the researcher might face a problem of limited finances while carrying out the research. However the researcher managed to overcome this by soliciting funds from a number of sources such as friends, family and relatives.

Some key respondents might be too busy as a result of their numerous schedules. This was overcome by giving the respondents enough time to fill and complete the questionnaires.
Partial disclosure of relevant information by some respondents. The researcher took appropriate measures to explain and motivate the respondents to accept the reasons why questionnaires were administered on them.

Chapter Four

Data Analysis, Presentation and Interpretation

4.0. Introduction

This chapter presents data analysis, presentation, summary of the findings and interpretation of the results are based on the study objectives formulated under chapter one. Descriptive statistics was used to analyse the background of respondents, objectives one and two. Pearson correlation was used to analyse objective three; relation between physical school environment and academic performance in government aided schools. Interview data were content analysed.

4.1. Demographic Characteristics of Respondents.

Demographic characteristics of the respondents were analysed according to gender, age bracket, classes of respondents (learners), their parents' level of education and parents' monthly income.

Table 2: Demographic Characteristics of Respondents (Learners).

		Frequency (N)	Percent (%)
Gender	Male	*57*	*57*
	Female	*43*	*43*
Age bracket	15-20 years	*48*	*48.0*
	21-26 years	*51*	*99.0*
	27 and above years	*1*	*1.0*
Class	Senior 1-2	*69*	*69.0*
	Senior 3-4	*31*	*31.0*
Education Level of Parents	Primary	*5*	*5.0*
	Secondary	*92*	*97.0*
	Diploma	*2*	*99.0*
	Degree	*1*	*1.0*
Income Level of Parents	100000-300000 shillings	*78.*	*78.0*
	400000-700000 shillings	*18*	*96.0*
	800000 and above shillings	*4*	*4.0*

Findings of the study show that the respondents are fairly balanced by gender, with males constituting 57% and females 43%. This distribution indicates a relatively inclusive sample with slight male dominance.

Most learners are young: 48% fall in the 15–20 years bracket, while 51% are in the 21–26 years category. Only 1% are above 27 years. This shows that the majority of respondents are within the expected secondary school-going age, although the presence of older learners (21–26) may reflect late school entry, dropouts returning, or schooling interruptions.

A larger proportion of respondents (69%) are in Senior 1–2, while 31% are in Senior 3–4. This means the sample is dominated by lower secondary learners who may have different academic needs, maturity levels, and perceptions compared to upper secondary students.

Most parents have a secondary level of education (92%), while very few have primary (5%), diploma (2%), or degree (1%) qualifications. This indicates that learners generally come from moderately educated households but with very limited higher-education parental background.

A large majority (78%) of parents earn between 100,000–300,000 UGX, showing low-income status. Only 18% fall in the middle-income range (400,000–700,000 UGX), and a small group (4%) are in higher income categories.

In summary, the male learners as respondents were slightly more than female respondents. Most learners felt within the typical school-going age, though there was a sizeable group aged 21–26. The majority are from lower secondary classes (S1–S2). Parents of learners largely have secondary education; higher academic attainment is rare. Most learners come from low-income households, indicating a financially disadvantaged background.

This implies that the learners' socioeconomic background may influence academic performance. With most parents earning low incomes and having modest education levels, learners may face challenges such as limited scholastic materials, poor study environments at home, or lack of parental academic support.

A young and lower-secondary-dominated sample affects perceptions and maturity Since most respondents are in S1–S2 and younger in age, their views on the subject under investigation (e.g., classroom management, motivation, academic performance) may reflect early secondary school experiences rather than senior-level academic demands.

Low parental education had reduced home-based academic guidance The dominance of parents with only secondary education suggested that learner support at home had been constrained, which have affected motivation, discipline, or performance.

Older learners (21–26) introduce diversity in perceptions. These students might have had unique experiences related to re-entry, work–study balance, or prior setbacks, potentially influencing the study outcomes. Interventions must consider economic realities. Any recommendations such as improving learning resources, guidance programs, or parental involvement should account for the financial limitations of most families.

Table 3: Demographic Characteristics of Respondents (Head Teachers).

		Frequency (N)	Percent (%)
Gender	Male	*60*	*60.0*
	Female	*40*	*100.0*
Age Bracket	31-35 years	*20*	*20.0*
	40-45 years	*80*	*100.0*
Teaching Experience	1-4 years	*20*	*20.0*
	5-8 years	*80*	*100.0*
Qualification	Postgraduate Degree	*60*	*60.0*
	Master Degree	*40*	*40.0*
Teaching in Class	Yes	*5*	*100.0*

The findings reveal that the head teachers are predominantly male (60%), compared to 40% female. This shows a gender gap in leadership, with men holding more headship positions. A majority (80%) of head teachers fall within the 40–45 years age bracket, while 20% are aged 31–35 years. This indicates that most head teachers are mature and experienced in the teaching profession, with only a small proportion of younger school leaders.

The distribution shows that 80% of head teachers have 5–8 years of teaching experience, while 20% have 1–4 years. This suggests that most head teachers possess relatively moderate teaching experience, although not extremely long service backgrounds.

A significant proportion (60%) possess postgraduate degrees, while 40% have master's degrees. This indicates a highly qualified leadership group, with all head teachers holding advanced degrees beyond undergraduate level. All the five head teachers reported that they

still teach in class. This reflects that though head teachers are fully occupied with administrative duties, they balance it up enter classrooms to teach.

This implies that the leadership maturity may positively influence school management. The concentration of head teachers within the 40–45 age group suggests a leadership team with sufficient maturity and life experience, which may contribute to effective decision-making and school stability.

Moderate teaching experience may affect classroom-related understanding. While most head teachers have teaching experience, their 5–8 years indicate moderate not extensive exposure. This may influence their ability to fully understand classroom-based challenges affecting teachers and students.

High qualification levels improve professionalism. The presence of postgraduate and master's degree holders demonstrates strong professional capacity. This may positively influence policy implementation, strategic planning and instructional leadership. Such qualifications may enhance the overall quality of school management.

Gender imbalance may influence leadership perspectives. Having more male head teachers than female may mean that gender-sensitive leadership practices vary and mentorship opportunities for female teachers may be limited.

4.1. Research Question One

What is the nature of physical school environment is present in the selected government-aided secondary schools of Northern Division in Mbale city?

The table 4 below presents descriptive statistics on various components of the physical school environment, rated on a scale of 1 to 5 (except for two items with outlier maximum values, indicating variation in responses).

Table 4: Descriptive Statistics Showing Physical School Environment

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
The buildings are well maintained and clean	*100*	*1.00*	*5.00*	*3.3800*	*1.48922*
The school has sufficient furniture and equipment	*100*	*1.00*	*5.00*	*3.4000*	*1.38535*
The laboratories have apparatus and well equipped	*100*	*1.00*	*32.00*	*3.8100*	*3.16769*
The school grounds are safe and secure	*100*	*1.00*	*5.00*	*3.5400*	*1.40288*
The school facilities are accessible to students with disabilities.	*100*	*1.00*	*4.00*	*3.4700*	*4.05132*
The school facilities are always monitored and maintained.	*100*	*1.00*	*5.00*	*3.4500*	*1.38808*
The school libraries are well built and equipped	*100*	*1.00*	*5.00*	*3.7900*	*1.39476*

All items in the table have mean scores ranging between 3.38 and 3.81 on a 5-point scale, indicating that respondents generally perceive the physical school environment as moderately adequate. However, some standard deviations are very high (e.g., SD = 3.167 and 4.051), showing wide variations in responses, meaning schools differ greatly in their level of facilities.

According to the findings on table 4, school buildings are well maintained and clean (Mean = 3.38). Respondents moderately agree. Maintenance is acceptable but not excellent. Sufficient furniture and equipment (Mean = 3.40). Furniture and equipment are fairly adequate, but some schools may still lack enough.

Laboratories have apparatus and are well equipped (Mean = 3.81, SD = 3.17) Respondents rate laboratories relatively high, but the very large standard deviation indicates big disparities some schools are very well equipped while others are extremely poor.

School grounds are safe and secure (Mean = 3.54). Safety and security are generally seen as moderate to good. Facilities accessible to students with disabilities (Mean = 3.47, SD = 4.05)

Although the mean is moderate, the extremely high SD suggests serious inconsistency. Some schools have disability-friendly facilities, while others have none. Facilities are always monitored and maintained (Mean = 3.45). Monitoring and maintenance are relatively fair but not consistent. School libraries are well built and equipped (Mean = 3.79). Libraries receive a good rating, suggesting they are among the best-performing physical components in the school environment.

The general perception of the physical school environment is moderately positive. Areas like libraries (3.79) and laboratories (3.81) score highest, showing relative strength. Building maintenance (3.38) and furniture adequacy (3.40) are moderate and require improvement. Extremely high standard deviations indicate major disparities between schools, especially regarding disability accessibility, laboratory equipment and safety and monitoring systems are present but not optimally strong.

The government and school management should prioritize targeted infrastructure investment to reduce disparities by equipping poorly resourced schools with essential facilities especially laboratories, disability-accessible structures, and adequate furniture to ensure a consistent and conducive learning environment across all institutions.

4.2. Research Question Two

What is the level of academic performance in the selected secondary schools of Northern Division in Mbale city?

Table 5 below assesses the level of students' academic performance using responses rated from 1 to 5, with higher means indicating more positive perceptions. The data reflects respondents' views on UNEB performance, curriculum understanding, academic priorities, teacher quality, motivation and resourcing. The means generally fall between 3.7 and 4.5, indicating a positive perception of academic performance, though there are some variations across items.

Table 5: Showing Descriptive Statistics Analysis on the Level of Students' Academic Performance.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Students in this school consistently perform well in UNEB	*100*	*1.00*	*5.00*	*4.1800*	*.85729*
Students in this school demonstrate the understanding of the curriculum	*100*	*1.00*	*5.00*	*4.0100*	*1.07774*
Academic achievement is the priority in this school.	*100*	*2.00*	*5.00*	*4.1500*	*.79614*
Students in this school are motivated to achieve academic success.	*100*	*1.00*	*5.00*	*4.0200*	*1.00484*
Teachers are of high quality.	*100*	*1.00*	*5.00*	*4.5100*	*5.14928*
The pass rate of students in this school is very high.	*100*	*1.00*	*5.00*	*3.9000*	*1.07778*
This school provides adequate resources to learners.	*100*	*1.00*	*5.00*	*3.7400*	*1.27620*

Findings indicate strong agreement that students consistently perform well in UNEB national exams. The relatively low standard deviation shows that most respondents share this positive view, suggesting reliable examination outcomes across cohorts. Learners generally agree that they understand the curriculum. The slightly higher standard deviation implies variation in comprehension, possibly due to differences in teacher effectiveness, learning environments, or resource availability across schools.

There is strong consensus that academic achievement is prioritized. The low variability suggests that most schools emphasize academic excellence through structured programs, supervision, and teacher support. Students are perceived as motivated toward academic success. The mean indicates a generally positive learning culture, though the standard

deviation shows that motivation levels differ likely influenced by teacher engagement, availability of opportunities, and home backgrounds.

This is the highest-rated item, indicating very positive perceptions of teacher quality. However, the unusually large standard deviation and maximum value (53) suggest inconsistent or erroneous responses. Despite this outlier, the high mean implies that learners view their teachers as competent, supportive, and well-prepared.

This slightly lower score compared to other indicators suggests that while performance is generally good, it may not be uniformly high across all subjects or student groups. The moderate variation indicates disparities between high-performing and low-performing classes or streams.

Respondents perceive learning resources as moderately adequate. This is one of the lowest ratings, revealing a key constraint affecting academic achievement. The high variability implies that some schools have well-supplied classrooms, while others struggle with insufficient textbooks, science equipment, ICT materials, and library support.

Generally, findings show that the level of students' academic performance is high, especially regarding UNEB results, curriculum mastery, and motivation. Learners strongly believe that academic achievement is a major priority in their schools. Teacher quality is viewed positively, despite anomalies in the data distribution. The pass rate is good but shows room for improvement. Availability of learning resources is the least positively rated factor, indicating inequality in resource distribution and potential barriers to optimal performance. Standard deviations show variability in several areas, implying that academic experiences differ across schools, streams, or classes.

Schools and educational authorities should strengthen resource provision and distribution by ensuring every school has adequate textbooks, laboratory materials, ICT tools, and library resources. This should be combined with regular monitoring of resource use, targeted support to underperforming schools, investment in student motivation programs (clubs, competitions and mentorship) and professional development for teachers to sustain high-quality instruction.

4.3. Research Question Three

What is the relation between physical school environment and academic performance in government aided schools of Northern Division in Mbale city?

Table 6 below shows the relationship between the physical school environment and the level of students' academic performance. The Pearson correlation coefficient between the two variables is r = 0.470, with a significance value of p = .000. This indicates a moderate, positive, and statistically significant relationship between the quality of the physical school environment and students' academic achievement. As the physical environment of the school improves, students' academic performance also tends to increase. The significance level ($p < 0.01$) confirms that this relationship is highly unlikely to have occurred by chance, meaning the observed correlation is reliable and meaningful for the study.

Table 6: Showing the Relationship between Physical School Environment and Academic Performance in Government-aided Secondary Schools (N=100).

Correlations

		Physical School Environment	Level of Students Academic Performance
Physical School Environment	Pearson Correlation	*1*	*.470***
	Sig. (2-tailed)		*.000*
Level of Students Academic Performance	Pearson Correlation	*.470***	*1*
	Sig. (2-tailed)	*.000*	

**. Correlation is significant at the 0.01 level (2-tailed).

Findings revealed that there is a moderately strong positive correlation (0.470) between the physical school environment and students' academic performance. The relationship is statistically significant at the 0.01 level, implying that better classroom infrastructure, sanitation, lighting, ventilation, safety and learning resources are associated with improved academic results among students. The sample size of 100 respondents provides adequate data to support the conclusion that the physical environment plays an essential role in influencing academic success in the studied schools. The correlation suggests that the school environment is not just a background factor but a meaningful contributor to students' ability to learn, concentrate and achieve higher scores.

The analysis clearly demonstrates that the physical school environment has a significant impact on students' academic performance. Schools with well-maintained facilities, conducive classrooms, adequate learning materials, and a generally supportive physical setting are more likely to produce better-performing students. This finding reinforces the importance of investing in school infrastructure as a key strategy for improving academic outcomes. Enhancing the physical learning environment should therefore be considered a priority for education stakeholders seeking to raise the academic standards and overall performance of students.

Figure 2: Showing the Relationship between Physical School Environment and the Level of student's Academic Performance.



Chapter Five

Discussions, Conclusions, Recommendations and Suggestions for Further Studies

5.0 Introduction

This chapter presents discussions arising from the investigations and findings on nature of physical school environment in government-aided secondary schools, the level of academic performance in government aided secondary schools and the relationship between the physical school environment and academic performance in government aided schools of Northern Division in Mbale city. The discussions are made following the research questions and conclusions are drawn from the findings. Recommendations are made thereafter.

5.1. Discussions

This section discusses the findings of the study as presented below.

5.2. *Physical School Environment is Present in the Selected Government-Aided Secondary Schools.*

The findings indicate that the physical school environment across the sampled schools is generally functional but characterized by significant disparities. While some schools enjoy well-equipped laboratories, adequate furniture, accessible facilities, and functioning libraries, others lack these essential components. This imbalance creates an unequal learning experience among students. The moderate mean ratings suggest that, overall, schools are able to support basic academic activities; however, the quality of facilities is neither uniformly high nor consistently supportive of excellent academic achievement.

The variability in the responses further highlights noticeable gaps in infrastructure. Schools with better-maintained classrooms, sufficient instructional materials, and safe, accessible spaces offer their learners a more favorable environment for engagement and performance. Conversely, schools with deteriorating structures, limited science equipment, and poor accessibility pose challenges that hinder effective teaching and learning. These conditions may contribute to disparities in academic outcomes, especially in science-based subjects where practical work is essential. The presence of inequalities in physical environments also raises concerns about inclusivity, particularly for learners with disabilities who require adapted infrastructure.

The finding that the physical learning environment is a key determinant of educational quality aligns closely with the conclusions of several scholars who have emphasized the central role of school infrastructure, safety, and resource availability in shaping learning outcomes.

Owoeye and Yara (2018) argue that well-resourced school environments significantly enhance students' academic achievement. Their study shows that facilities such as equipped classrooms, functional libraries, and science laboratories directly contribute to improved performance. This resonates with the present finding that disparities in resource distribution can widen performance gaps across schools.

Saeed and Wain (2019) similarly highlight the importance of a conducive school environment, noting that safe, well-maintained buildings and adequate instructional materials promote student engagement and academic success. Their work supports the view that schools lacking essential physical conditions struggle to provide high-quality education.

Bakari et al. (2020) reinforce this perspective by demonstrating that physical infrastructure, including classroom space, ventilation, lighting, and sanitation, significantly influences both teaching and learning processes. They emphasize that inadequacies in the school environment can demotivate learners and teachers alike, mirroring the findings that inconsistent infrastructure undermines effective learning.

Mgbodile (2014) stresses that school facilities are foundational to achieving educational objectives. According to Mgbodile, a poorly equipped school environment limits student participation and reduces instructional quality. This aligns with the current finding that inequalities in resource availability create unequal learning opportunities.

Arul Laurence (2015) provides evidence that students in well-maintained and resource-rich schools outperform those in dilapidated settings. He concludes that the school environment shapes learners' attitudes, concentration, and academic performance a direct reflection of the need for equitable, conducive learning spaces.

Entwisle (2018) further supports this by showing that environmental conditions influence long-term academic trajectories. Factors such as overcrowding, building deterioration and lack of facilities disproportionately affect disadvantaged learners, reinforcing the current study's concern about inequitable access to conducive environments.

Lastly, Warner (2018) argues that equitable distribution of school resources is essential for bridging educational disparities. His findings resonate strongly with the idea that improving under-resourced schools is necessary to ensure fairness and enhance overall educational quality.

These scholars collectively affirm that the physical learning environment is a powerful determinant of academic success. Their works echo the central claim that access to safe, well-equipped, and conducive school environments must be prioritized to achieve equitable and high-quality education for all learners. The convergence of evidence underscores the urgency of addressing infrastructural inequalities as a critical strategy for improving educational outcomes.

5.3. *Level of Academic Performance in the Selected Secondary Schools.*

The findings portray a generally positive academic climate in which learners express high confidence in their academic performance and the quality of their school environment. Students report strong performance in national examinations, supported by competent teachers and a school culture that places high value on academic excellence. These strengths contribute to elevated motivation, which is a critical driver of sustained academic engagement and achievement.

However, beneath this positive outlook lie notable disparities that affect learning outcomes across different schools and learner groups. The lower mean score for resource adequacy signals a structural gap: not all students have access to sufficient learning materials, well-equipped classrooms, or conducive learning facilities. These differences in resources create significant inequality, especially for learners in under-resourced schools who may struggle to keep pace despite their motivation.

The variation in pass rates and curriculum understanding indicates that the strong academic performance is not uniform. Some learners benefit from individualized teacher attention, adequate instructional materials, and supportive learning environments, while others face challenges such as overcrowded classrooms, inadequate learning resources, or inconsistent instructional quality. These disparities suggest that systemic barriers rather than learner ability or motivation are contributing to uneven performance patterns.

The findings showing that learners express confidence in their academic performance, supported by competent teachers and a strong school academic culture, align closely with

conclusions drawn by several scholars who emphasize the role of school environment, teacher quality, and institutional culture in shaping academic success.

Ballotpedia (2023) reports that positive school climates characterized by supportive teacher–student relationships, effective instructional practices, and a culture that emphasizes academic excellence tend to produce higher student achievement outcomes. This aligns with the present findings where motivated learners benefit from schools that prioritize academic performance, resulting in strong national examination results.

Lamas (2015) similarly demonstrates that students' academic self-concept and the belief in their own ability significantly influence their achievement levels. Lamas argues that confidence and positive perceptions of school quality reinforce motivation, which in turn enhances performance. This reflects the current study's observation that motivated learners within academically oriented school cultures exhibit strong academic outcomes.

Louis (2012) highlights the importance of professional and supportive school leadership in creating environments that foster academic success. According to Louis, effective leadership strengthens teacher commitment, improves instructional quality, and promotes a culture of high expectations all of which contribute to strong student performance. The findings from the present study mirror this relationship, as learners attribute their high performance to competent teachers and a positive school culture.

Lodhi et al. (2019) found that students' academic achievements are strongly influenced by teacher effectiveness, availability of academic support, and the school's focus on learning outcomes. Their study shows that when schools maintain a strong academic orientation and students feel supported by their teachers, performance increases. This supports the current study's emphasis on teacher quality as a major contributor to academic success.

Kibriya and Jones (2020) also observed that schools with strong academic traditions, effective pedagogy, and high student motivation tend to register superior examination results. Their research highlights that academic achievement is not merely a product of cognitive ability but also of environmental and motivational factors, such as school culture and teacher competence. This parallels the findings presented here, where learners thrive in an environment characterized by high expectations and motivation.

Generally, across studies by Ballotpedia (2023), Lamas (2015), Louis (2012), Lodhi et al. (2019), and Kibriya and Jones (2020) the recurring message is clear: students perform better

academically when supported by strong school cultures, competent teachers, and environments that cultivate motivation and high expectations. The study findings reaffirm this evidence by showing that strong national performance among learners is driven not only by individual motivation but also by the quality of the school environment and instructional support they receive.

5.4. *The Relation between Physical School Environment and Academic Performance in Government Aided Schools.*

The findings show a moderately strong and statistically significant positive correlation ($r = 0.470$, $p < 0.01$) between the physical school environment and students' academic performance. This relationship indicates that improvements in the physical conditions of schools such as better classroom infrastructure, adequate lighting and ventilation, proper sanitation, safety measures, and sufficient learning resources are associated with higher academic achievement among learners. The significance level confirms that this outcome is not due to chance, demonstrating a reliable and meaningful connection.

With a sample size of 100 respondents, the study provides credible evidence that the school environment is a critical factor in shaping academic outcomes. The results underscore that the physical environment does more than provide a setting for learning; it actively influences students' concentration, motivation, attendance, and ability to perform well in examinations. Schools with well-maintained buildings, organized classrooms, safe learning spaces and adequate instructional materials tend to foster conducive learning atmospheres that support higher academic performance.

Conversely, schools lacking these facilities may struggle with issues such as student distraction, absenteeism, poor health conditions, and reduced teacher effectiveness all of which negatively impact learning. The findings therefore reveal that physical school conditions contribute significantly to educational quality by supporting both teaching and learning processes. These findings highlight the necessity of prioritizing school infrastructure development as a strategic intervention for improving academic performance. Education stakeholders must recognize that learning outcomes are closely tied to the environments in which students learn.

The finding that the physical school environment has a moderately strong and statistically significant influence on students' academic performance is strongly supported by a range of

scholars whose work similarly demonstrates the importance of school infrastructure and physical conditions in shaping learning outcomes.

Wisenbaker (2023) emphasizes that high-quality school environments characterized by proper ventilation, adequate lighting, functional classrooms, and safe learning spaces directly enhance students' ability to concentrate and absorb content. His research shows that improvements in infrastructure significantly boost learner engagement and academic productivity, aligning closely with the present study's conclusion that good physical conditions promote higher performance.

Waxman (2018) found that students who learn in well-maintained, resource-rich environments consistently outperform peers in poorly maintained schools. Waxman argues that elements such as comfortable seating, clean classrooms, and adequate instructional materials reduce distractions and increase academic focus. This resonates with the finding that classroom infrastructure and sanitation play a meaningful role in determining academic performance.

Madudili (2019) similarly reported that the school environment is a major determinant of student achievement. His study revealed that poor classroom conditions and inadequate facilities negatively affect students' ability to participate actively in lessons and perform well in examinations. Madudili's conclusions reinforce the current evidence that resource availability and physical safety are pivotal for academic success.

Korir and Kipkemboi (2014) showed that the learning environment particularly classroom ventilation, lighting, and general physical comfort significantly affects both teaching effectiveness and student learning outcomes. Their findings confirm that a conducive physical environment is essential for enhancing concentration, motivation, and comprehension, which aligns with the present correlation between school conditions and academic performance.

Mushtaq-ur-Rehman (2016) examined school infrastructure in developing-country contexts and concluded that well-equipped classrooms, availability of learning materials, and proper building maintenance have a strong impact on academic achievements. His work parallels this study's observation that improvements in physical conditions lead to measurable gains in student performance.

Odutuyi (2015) also found that the physical school environment especially safety standards, classroom layout, and accessibility of resources strongly predicts students' academic

outcomes. Odutuyi noted that students in schools with adequate facilities tended to demonstrate better discipline, higher attendance rates, and stronger academic results, mirroring the findings reported here.

All these authors, a consistent pattern emerges: the physical condition of the learning environment is a powerful and reliable predictor of student academic performance. Whether through improved lighting, ventilation, sanitation, safety, or resource availability, a better physical school environment enhances students' cognitive focus, motivation, participation, and overall academic success. The present findings fit squarely within this well-established body of scholarly evidence, underscoring that investments in school infrastructure are essential for improving educational outcomes.

5.5. Conclusions.

The study concludes that although the physical school environment in secondary schools is moderately adequate, significant inconsistencies and inequalities in infrastructure across institutions negatively influence the quality of teaching and learning, thereby, affecting students' educational experiences and outcomes.

The study concludes that although learners perceive their academic performance positively and benefit from strong teacher quality and school culture, significant inequalities in resources and learning conditions persist across schools.

The study concludes that the physical school environment plays a vital and statistically significant role in determining students' academic performance. Improved infrastructure and conducive school conditions contribute meaningfully to learners' ability to achieve higher academic outcomes, making environmental quality a key determinant of educational success.

5.6. Recommendations.

It is recommended that Ministry of Education and Sports and education stakeholders prioritize targeted infrastructure investment, specifically directing resources toward the most under-resourced schools.

This study recommended that education authorities prioritize targeted resource allocation and infrastructural improvement in the most disadvantaged schools to better academic performance.

The researcher recommended that policymakers, school administrators and government stakeholders increase targeted investment in school infrastructure, focusing especially on upgrading classrooms, enhancing sanitation, improving lighting and ventilation, and providing adequate learning materials to enhance academic performance.

5.7. Contributions of the Study

The findings provide empirical evidence for education authorities in Mbale City and Uganda on the state of the physical school environment and its relationship with students' academic performance.

The findings can help head teachers, Boards of Governors and school management teams identify specific weaknesses in the school environment that may constrain students' learning.

The study contributes by demonstrating the extent to which the physical school environment is associated with students' academic performance.

The findings can encourage schools and stakeholders to view infrastructure not merely as physical assets, but as an important component of the conditions necessary for effective learning and achievement.

The study adds to the body of empirical knowledge on school environment and academic performance, particularly within government-aided secondary schools in an urban Ugandan context.

5.8. Suggestions for Further Studies.

1. Influence of Classroom Infrastructure and Students' Academic Performance in Government-Aided Secondary Schools in Mbale City.

2. Sanitation and Hygiene Facilities and Students' Academic Engagement in Secondary Schools in Mbale City.

3. School Safety and Security and Students' Academic Performance in Secondary Schools in Mbale City.

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Appendices

Appendix A: Introductory Letter

Appendix B: Krejcie and Morgan Table of Sample Size Determination (1970)

N	S	N	S	N	S	N	S	N	S
10	10	10	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	256	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	100000	384

Sample Size(s) required for the given Population Sizes (N)

Appendix C: A Sketch Map of Mbale City Showing the Study Area

