



Examining the influence of school infrastructure on retention of students in secondary schools in Bukwo district, eastern Uganda

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ABSTRACT

The study examined the influence of school infrastructure on retention of students in secondary schools in Bukwo district, eastern Uganda. The study was guided by systems theory. A cross-sectional survey research design was adopted. It involved 10 secondary schools since the intention was to find out whether they have adequate infrastructures which contribute to students' retention in secondary schools. Purposive sampling technique was used to select 10 headteachers, 32 teachers and 50 students to partake in the study. Interviews, observations and documentary guides were used for data collection. Qualitative data was analyzed thematically. The study revealed that, secondary schools in Bukwo district eastern Uganda have inadequate infrastructures like classrooms, furniture, ventilations and lighting. This was confirmed by the headteachers, teachers and students participated in the study when they reechoed that, infrastructures in Bukwo secondary schools are inadequate. Therefore, inadequate infrastructures negatively affect students' retention. Further this research concluded that, retention of students is below the expectations of the stakeholders. It also emphasized that, adequate infrastructures positively impact the retention of students in secondary schools in Bukwo district eastern Uganda. The study recommended that; the government of Uganda should extend more support to the learning institutions with all the necessary financial aid needed to renovate and establish the infrastructures to boost the retention of learners in secondary schools. School administrators should implement infrastructures reorganization strategies to ensure that, students have adequate space to learn and accommodate diverse learning styles.

Key words: Eastern, Secondary Schools in Bukwo, School Infrastructure, Students' Retention, Uganda.

I. INTRODUCTION

Education is widely recognized as a cornerstone of personal, and societal development, playing a critical role in fostering economic growth, social cohesion, and individual empowerment. As a results, nations around the universe have invested in learning institutions through reestablishing modern, and maintenance of infrastructures like classrooms, furniture, ventilation, and lighting with the major aim of attracting, and retaining students in secondary schools (Chankseliani, 2022). However, the ability of educational systems to retain students until they complete their courses remains a pressing challenge, particularly in low-income, and developing regions (Gonzales, *et al*, 2021). Around the world, numerous global studies have demonstrated the significant impact of school infrastructure such as classrooms, furniture, ventilation, and lighting on the retention of students for example, Fullan (2015) stressed that, schools with good facilities not only help students perform better, but also create a sense of belonging raising the learners' retention



in secondaries. He added on that, in well-respected education systems like those in Finland and Canada investing in school buildings has been linked to higher student retention and better academic outcomes. In the same line, West and Meier (2020) and Ewiss (2021) found a strong correlation between the quality of school facilities and students' attendance in Africa. This indicates that, school infrastructure factors such as good classrooms, furniture, ventilation, and lighting increases students' retention and minimize dropout rates in secondary schools. When students feel safe and comfortable in their schools' infrastructure like classrooms, furniture, ventilation and lighting, they are more likely to stay engaged and committed to learning which uplifts the retention of learners in secondary schools.

In response to the learners' retention challenges in learning institutions were only 65% of students complete their education, with a startling 35% dropping out before completion, the government of Uganda has acknowledged the urgency of investing in secondary schools' infrastructure like classrooms, furniture, ventilation and lighting to bolster student retention rates, Uganda Ministry of Education and Sports (MoES, 2017). Moreover, the analysis suggested that, enhancements in school facilities, such as modern classrooms, furniture, ventilation, and lighting are closely linked to higher enrollment figures and lower dropout rates in schools (Ngwama, 2024). In addition, Kironde *et al.* (2025), Magwaga and Kikechi (2024) emphasized that, initiatives aimed at upgrading infrastructure in secondary schools have exhibited positive effects on student persistence. Quality educational infrastructures are paramount for effective learning, and critically enhances students' retention rates, United Nations Education, Scientific and cultural Organization (UNESCO, 2024). In the same line, Mugume and Bulime (2023) noted that, schools with improved infrastructures such as classrooms, furniture, ventilation, and lighting have better students' retention than their counterparts with poor school facilities. Similarly, Kibirige *et al.* (2025a) confirmed that, the quality of infrastructure including classrooms, furniture, ventilation and lighting play indispensable role in fostering an effective learning environment which strengthen the retention of students in secondary schools. In agreement with the above, Buyera, (2025) and Barbra, *et al.* (2025) indicated that, inadequate facilities adversely affect students' attendance culminating in increased dropout rates in secondary schools. Kaziro and Ahumuza, (2024) emphasized that, schools with insufficient infrastructure are associated with lower levels of student retention. Therefore, stakeholders such as administrators, teachers, parents and students should join up the efforts to elevate the infrastructures qualities like classrooms, furniture, ventilation and lighting as a mechanism for boosting the retention of students in secondary schools.

This research is excellent and bolster the body of knowledge in several ways for instance, it bridges a gap in literature by examining the relationship between school infrastructure and retention of students in secondary schools. This paper gives the practical analysis of the relationship between school infrastructure and retention of students. It also creates vital information towards attaining the Ugandan vision of 2040 goals for quality education. Unlike the previous scholarly works that assessed parent activities and the retention of students in secondary schools in Bukwo district, (Cheptoyek, 2024). This study examined the relationship between school infrastructure, and its influence on the retention of students. The objective of this study is to assess the infrastructure of secondary schools in Bukwo district, eastern Uganda. This study also assessed how school infrastructure influences the retention of students in secondary schools in Bukwo district, eastern Uganda.

1.1 Statement of the Problem

Secondary schools in Bukwo district, eastern Uganda are currently facing a critical challenge with student retention rates ranging from 75% to 85% which falls alarmingly short of the national standard of 90% set by the ministry of education, and sports, District Education Office (DEO, 2023). As of 2022, the national completion rate for O' Level in Uganda was reported at 47.5%, indicating significant challenges in retaining students through to the completion of secondary education (MoES, 2017). The implications of these low retention rates extend far beyond individual students; they impact families, and the wider community, leading to heightened dropout rates, and diminished educational attainment. Efforts by the government of Uganda like Universal Secondary Education (USE) aimed at increased enrollment and retention rates, these initiatives have largely overlooked critical infrastructural issues, inadequate classrooms, furniture, ventilation and lighting with poor conditions may pose significant barriers that contribute to the dropout crisis (MoES, 2017). Understanding the influence of infrastructure in influencing retention is crucial for developing targeted interventions that can effectively address this pressing issue and promote students' retention in the region. The stark retention rates highlight profound deficiencies in the educational framework not only of Bukwo district, eastern Uganda, but of the country at large. If these infrastructural challenges are not addressed, the cycle of high dropout rates will continue, jeopardizing the educational prospects of youth and stunting the socio-economic growth of the region. It is upon this background that, this study is carried out to examine how school infrastructure, affect student retention rates in secondary schools in Bukwo district, eastern Uganda, aiming to identify actionable solutions that can reverse the current trends, and foster a more conducive learning environment favorable for retention of learners in secondary schools.



1.2 Research objectives

- i. To assess the infrastructure of secondary schools in Bukwo district, eastern Uganda.
- ii. To examine the retention of students in secondary schools in Bukwo district, eastern Uganda.
- iii. To assessed how school infrastructure influences the retention of students in secondary schools in Bukwo district, eastern Uganda.

II. LITERATURE REVIEW

2.1 Theoretical Review

The study was based on the Systems Theory. This study was recommended in 1956 by Ludwig Von Bertalanffy (Bertalanffy, 1956). The dogma of system theory emphasizes on the relationships between the subunits which join them as a whole. Thus, the same concepts of secondaries present the different infrastructures like classrooms, furniture, ventilation, and lighting which are interlinked to uplift the retention of students. Systems Theory was suite for this study because from its principle, it conducts a secondary as a system whereby all elements are categorized by a combination of units whose purposes as a part are connected for specific goal (Bertalanffy, 1956). Therefore, the system units of secondary infrastructures should be organized to enable secondary schools retains its learners. These subunits in secondary schools are supposed to be effectively supervised by stakeholders to enhance on the retention of learners.

2.2. Empirical review

2.2.1 Infrastructure in secondary schools

School infrastructure like classroom, furniture, ventilation and lighting plays a fundamental role in shaping education quality and the retention of student in secondary schools (Kibirige *et al.* 2025b). A comprehensive study in developing nations revealed that, infrastructure like classrooms, furniture, ventilation, and lighting fundamentally shapes education quality, academic performance, and students' retention in secondary schools (Fernández *et al.* 2025). Similarly, Kaziro, and Ahumuza (2024) asserted that, infrastructure including, classroom, furniture, ventilation, and lighting improve the retention of students in Uganda. Andrade (2024) confirmed that, school infrastructure like classrooms, furniture, ventilation, and lighting improves leaners' retention in secondary schools. In addition, Jeptanui (2023) emphasized that, infrastructure improved the academic achievement, and the retention of learners in Finland. This was supported by Kamanzi *et al.* (2017) who revealed that in Tanzania, inadequate facilities like classrooms, furniture, ventilation, and lighting increase absenteeism, and significantly affecting the retention of students in secondary schools. In the same rhythm, the study conducted in Rwanda revealed that, infrastructures influence the retention of learners in schools. Therefore, effective management and provision of quality infrastructure like classrooms, furniture, ventilation and, lighting in institution enables secondary schools to retain leaners.

Research carried out by Zickafoose *et al.* (2024) showed that, infrastructure like, classrooms, furniture, ventilation, and lighting impact the retention of students in secondary schools. This was confirmed by Hamouda *et al.* (2024) who indicated that, poor classrooms, ventilation, insufficient lighting, and limited seating arrangements negatively affect student retentions in secondary schools. In the same line, Seherrie (2023) also stated that, school infrastructure affects leaners' retention. Overcrowded classrooms and deteriorating infrastructure like, classrooms, furniture, ventilation and lighting significantly impact education quality and students' retention in secondary schools (UNESCO, 2024). In addition, Yu, *et al.* (2024) emphasized that, schools with proper maintenance and adequate infrastructures show marked improvements in the retention of student. School infrastructure positively affects the retention of students in secondary schools Ngwama (2024). Therefore, institutions should invest in infrastructures like, classrooms, furniture, ventilation and lighting to improve on the quality of learning environment, and students' retention in secondary schools.

2.2.2 Retention of students in secondary schools

Furthermore, Cheptoyek, (2024). Emphasized that, parent activities influence student's retention in secondary schools. In addition, Winter, (2024) confirmed that parent involvement impacts learners' retention in schools. In the same line, Mwenyi, and Buyera, (2025) affirms that, instruction materials positively impact students' retention in secondary schools. Therefore, parents' activities and instructional materials impact students' retention in secondary schools. In addition, Goncalves, *et al.* (2024) states that, institutional activities like effective management of classrooms, furniture, ventilation and lighting influence learners' retention in schools. In rhyme with the above, Oginga and Ayienda, (2023) opined that, infrastructures including classrooms, furniture, ventilation, and lighting impact students' retention in secondary schools. Therefore, administrators need to effectively manage factors outside schools like parents' involvement and within schools like instructional materials to enable secondary schools retain students.

2.2.3 Relationship between infrastructure and retention of students in secondary schools

Analysis of research on retention rate across within diverse geographical contexts demonstrated significant variations in student retention rates based on infrastructure quality like classrooms, furniture, ventilation and lighting, (Umimana & Andala, 2020). In the same rhythm, Smith (2024) documented substantial improvements in retention rates across educational institutions with adequate infrastructure. In light with the above, Anderson (2024) emphasized that, infrastructure improvements directly correlate with increased retention rates. Similarly, Burns (2023) showed that, technology-enabled classrooms significantly enhance student retention rates in secondary schools. A study conducted by Runhare and Hwami, (2014) across South Africa, Nigeria, and Kenya documented 15-20% higher retention rates in schools based on improved infrastructures. In addition, Amutabi, and Agoot, (2021) revealed that, school infrastructure classrooms, furniture, ventilations, and lighting positively impact students' retention in secondary schools. In the same line, Marcel *et al.* (2024) confirmed that, well-equipped infrastructures in secondary schools bolster the retention of students in secondary schools. Zickafoose *et al.* (2024) stated that, school infrastructure plays a vital role in the retention of students in secondary schools. Also, Jeptanui (2023) revealed that, infrastructures positively impact students' retention in secondary schools. In addition, Seherrie (2023) confirmed that, students' retention is based on the school infrastructures in secondary schools. Therefore, school administrators should put in place sufficient, and adequate infrastructures like classrooms, furniture, ventilation, and lighting in order to boost learners' retentions in secondary schools.

III. METHODOLOGY

3.1 Research Design

This study adopted a cross-sectional research design, which is a specific type of observational study that focuses on examining data collected at one particular point in time to provide a comprehensive description of a population, (Thomas, 2020). This design was particularly well-suited for this research because it allows for the assessment of current conditions related to school infrastructure and student retention rates (Wang & Cheng, 2020). This design was used together with qualitative approach. This approach enabled the scholar to gather detailed non-numeric data on the topic. Data for the study was collected from 10 secondary schools found in Bukwo district. These secondary schools were crucial in generating a detailed knowledge of assessing how school infrastructure influence the retention of students in secondary schools in Bukwo district, eastern Uganda. These schools were purposively sampled to participate in the study.

3.2 Study area

The study was conducted in Bukwo District, located in Eastern Uganda. Bukwo District is approximately 140 kilometers northeast of Mbale City. The district is situated on the northern slopes of Mount Elgon, bordering Kenya to the east, and shares boundaries with Kween District to the south, Kapchorwa District to the southwest, and Amudat District to the north. The district features a mountainous terrain as part of the Mount Elgon region, with elevations ranging from 1,500 to 2,500 meters above sea level, according to Uganda Bureau of Statistics in 2024. Bukwo district education service commission empowers secondary schools found in the district with financial support in order to elevate the retention of students (DEO, 2023). These schools are also aided by the government of Uganda with the major purpose of improving the retention of students. However, stakeholders are dissatisfied with the retention of students in these schools (MoES, 2017).

3.3 The scope of the study

The study was carried out in secondary schools found in Bukwo district eastern Uganda. These schools were chosen basing on its effective management of infrastructures that supports students' retention. However, stakeholders are dissatisfied with the learners' retention in these secondary schools. The study also focused on the students' retention in secondary schools found in Bukwo district.

3.4 Population and Sample

The targeted population were 120. However, only 92 of the total population participated in the study including 10 headteachers, 32 teachers, and 50 students. The headteachers and teachers were purposively sampled while students were selected basing on the judgement of a researcher. The headteachers helped to organize teachers and students in schools. These participants were all chosen because they gave reliable, trustworthy and consistent data required for the study.



3.5 Data collection

The study employed observations, interviews and documentary analysis techniques to collect data. Interviews were employed on the 10 headteachers, 32 teachers, and 50 students. Documentary analysis was conducted on school infrastructures and attendance reports. The study also conducted observation analysis, teachers and students were observed in the ongoing lessons.

3.6 Data analysis

Qualitative data was examined by thematic approaches. Interviews and documentary analysis were assessed, abridged, revised and noted on the paper. The analysis was managed in three stages such as, preparing and organizing data, creating themes and coding. The preparation and organization of information for analysis commenced from the field with reading the recorded summarized interview and documentary analysis session. This empowered the researcher to get familiar with the information. This step was followed by writing a detailed record of the interview and documentary analysis reports which assisted the scholar to create themes. After creating themes, data was connected up with themes generated, through prof-reading and coding of information.

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Infrastructure in secondary schools

The first objective assessed the infrastructure of secondary schools in Bukwo district, eastern Uganda. Schools were expected to possess favorable infrastructures like classrooms, furniture, ventilation and, lighting. Findings from headteacher's interviews (May 2025) revealed that, secondary schools have inadequate infrastructures. For example, In the interview with the headteacher respondent number 1, she noted that, secondary schools have insufficient infrastructure like classrooms, furniture, ventilation and lighting leading to the poor students' retention (2/05/2025). This was confirmed in an interview with the headteacher, respondent number 2 who said:

"... The unsatisfactory infrastructure conditions in secondary schools are fundamentally rooted in inadequate government budget allocations to rural districts, where Bukwo competes with urban areas for limited educational infrastructure funding." (Head teacher 2, interview, 2/05/2025).

This was confirmed by the teacher's respondent number 30 who narrated in her interview that, inadequate infrastructures it has increased students' drop outs in secondary schools in Bukwo district (Teacher 30, interview, 3/05/2025).

On the same issue, teacher 26's response in their interview was in agreement with all the above teachers when he said:

"... The infrastructure crisis in secondary schools is primarily attributable to challenging geographical positioning of the district on the northern slopes of Mount Elgon, creating substantial barriers to construction and maintenance activities, this has made students' retention poor." (Teacher 26, interview, 3/05/2025).

This was reechoed by all the students in their interview who emphasized that:

"... The unsatisfactory infrastructures have made students' retention in secondary schools poor in Bukwo district eastern Uganda." (Students, interview, 3/05/2025)

It was also indicated in the observation analysis carried out in the ongoing lessons that, infrastructures like classrooms, furniture, ventilations and lighting are inadequate in secondary schools in Bukwo district. In addition, documentary analysis conducted on School infrastructure reports specified that, learning facilities are below the expectations of the stakeholders in secondary schools. Inadequate infrastructures negatively affect students' retention. This was confirmed in the study carried out by Kibirige *et al.* (2025a), Fernández *et al.* (2025), Kaziro, and Ahumuza (2024), Andrade (2024), who emphasized that, infrastructures influence the retention of students in secondary schools. Therefore, inadequate infrastructures negatively impact students' retention in secondary schools of Bukwo district eastern Uganda

4.1.2 Retention of students in secondary schools

The second objective examined the retention of students in secondary schools in Bukwo district, eastern Uganda. Findings from interview (May 2025) indicated that, students' retention is poor in secondary schools. for instance, the interview held with all the 10 headteachers revealed that, the students' retention is below the expectations of the stakeholders (10 head teachers, interview, 3/05/2025). This was confirmed in the interview by teachers' respondents 1, 11, 20 and 27 who said:

"... The students' high dropout rate in secondary schools in Bukwo district eastern Uganda is primarily attached to deficient infrastructures like classrooms, furniture, ventilation and lighting. They added on that, students continuously recalculating the cost-benefit ratio of their educational investment, where poor



infrastructure reduces perceived benefits while increasing psychological costs over time hence leading to school dropout.” (Teachers 1, 11 and 20, interview, 4/05/2025).

In the same line, teachers’ respondents 13, 19, and 24 all agreed in their interview that:

“... The retention rate of learners in secondary schools found in Bukwo district eastern Uganda is below the expectations of the stakeholders.” (Teachers 13, 19 and 24, interview, 5/05/2025).

This was reechoed by students who revealed in their interview that,

“... Deficient infrastructures have made secondary schools in Bukwo district to find it hard to retain and maintain students enrolled from S.1 up to S.6, because older students having better understanding of educational requirements for their career goals, this makes them to discontinue when facilities cannot support their academic ambitions.” (Students, interview, 6/05/2025)

It was also confirmed in the observation analysis carried out in ongoing lessons that; students’ retention is below the set targets of the stakeholders. In addition, documentary analysis conducted on School attendance records, indicated that, students’ retention is below the expectations of the stakeholders in secondary schools. Smith (2024) and Anderson (2024) confirmed that, poor retention of students negatively affects the set goals of secondary schools. Therefore, poor retention of students negatively affects the academic progress of secondary schools in Bukwo district eastern Uganda.

4.1.3 Relationship between infrastructure and retention of students in secondary schools

The third objective assessed how school infrastructure influences the retention of students in secondary schools in Bukwo district, eastern Uganda. Findings from interview (May 2025) revealed that, inadequate infrastructure negatively impact students’ retention in secondary schools. For example, In the interview with the headteachers respondent number 1, 2, and 9 they emphasized that, inadequate infrastructure such as classrooms, furniture, ventilation and lighting negatively impact students’ retention in secondary schools, (Head teachers1, 2 and 9, interview, 7/05/2025). Related to above, another headteacher respondent 5 and 10 in their interview confirmed that:

“... Schools with superior infrastructure create conducive learning environments that foster student attachment, educational commitment and improves students’ retention, while those with poor facilities experience cumulative negative effects on student motivation and engagement, making learners’ retention poor.” (Head teacher 5 and 10, interview, 7/05/2025)

Similarly, all the 30 teachers’ respondents agreed with headteachers as follow:

“... Adequate infrastructures like classrooms, furniture, ventilations and lighting positively impact learners’ retentions, yet insufficient infrastructures negatively affect the students’ retentions in secondary schools.” (30 Teachers, interviews, 8/05/2025)

It was also reemphasized in the interview with students that:

“... Adequate infrastructures positively impact the students’ retention in secondary schools.” (Students, interview, 8/05/2025).

The study also showed in the observation analysis conducted in the ongoing lessons that, secondary schools with adequate infrastructures have a better students’ retention than their counterparts with poor infrastructures. In addition, documentary analysis conducted on school infrastructures and attendance records revealed that, sufficient infrastructures positively impact students’ retention in secondary schools. This was confirmed by Burns (2023), Runhare, and Hwami, (2014) who revealed that, adequate infrastructure positively impacts the retention of students in secondary schools which help Uganda national development plan to achieve her target of obtaining highly qualified human capital. Therefore, sufficient and adequate infrastructures positively impact the retention of students in secondary schools found in Bukwo district eastern Uganda.

4.2 Discussion

The study revealed that, secondary schools in Bukwo district eastern Uganda have inadequate infrastructures like classrooms, furniture, ventilations and lighting. This was confirmed by the headteachers, teachers and students participated in the study when they reechoed that, infrastructures in Bukwo secondary schools are inadequate. Therefore, inadequate infrastructures negatively affect students’ retention. This was confirmed in the study carried out by Kibirige *et al.* (2025a), Fernández *et al.* (2025), Kaziro, and Ahumuza (2024), Andrade (2024), who emphasized that, infrastructures influence the retention of students in secondary schools. Therefore, concerned stakeholders like government, administrators, teachers, parents and students in institutions of learning should provide adequate and sufficient infrastructures including classrooms, furniture, ventilations, and lighting to elevate the retention of learners in secondary schools.

The study indicated that, the retention of students in secondary schools is below the expectations of stakeholders which affect the set goals of the Uganda's vision 2040 that looks at enhancing human capital with skills, values, techniques, knowledge, and attitudes necessary for developing the country. This was confirmed by the headteachers, teachers and students participated in the study who reechoed that, students’ retention in secondary schools is not



satisfying the set goals of stakeholders. In addition, Kibirige and Lutalo (2025c), Umimana and Andala, (2020), Smith (2024), Anderson (2024) confirmed that, poor retention of students negatively affects the set goals of the Uganda's vision 2040 for producing a wholistic individual. Therefore, stakeholders should support the institutions of learning to enable secondary schools retain students from the time of enrolment to the completion of the learning periods to realize the vision of 2040.

The study also revealed that, adequate infrastructures such as classrooms, furniture, ventilation and lighting positively impact the retention of students in secondary schools. This was reemphasized by the headteachers, teachers and students participated the study who narrated that, sufficient infrastructures uplift the retention of students. This was confirmed by Burns (2023), Runhare, and Hwami, (2014), Amutabi, and Agoot, (2021) who revealed that, adequate infrastructure positively impacts the retention of students in secondary schools which help Uganda national development plan to achieve her target of obtaining highly qualified human capital. Therefore, stakeholders should provide adequate infrastructures in institutions of learning in order to improve the retention of students in secondary schools.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study examined the influence of school infrastructure on retention of students in secondary schools in Bukwo district, eastern Uganda. From the results of this research, the study concluded that, infrastructures in secondary schools in Bukwo district eastern Uganda are inadequate. Further the research indicated that, retention of students is below the expectations of the stakeholders. It also emphasized that, infrastructures positively impact the retention of students in secondary schools in Bukwo district eastern Uganda.

5.2 Recommendation

The study recommended that; the government of Uganda should extend more support to the learning institutions with all the necessary financial aid needed to renovate and establish the infrastructures to boost the retention of learners in secondary schools. School administrators should implement infrastructure reorganization strategies to ensure that, students have adequate space to learn and accommodate diverse learning styles.

Declaration of Interest

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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