

Infrastructure Development and Student Performance in Vocational Institutions in Makindye Division, Kampala District

Sserwanja Asadu¹, Nabukeera Madina², Matovu Musa³,
Ssali Muhammadi Bisaso⁴

¹Post graduate student, Faculty of Education, Islamic University In Uganda.

²Assoc.Prof. Dr., Faculty of Management Studies, Islamic University In Uganda.

³Assoc.Prof. Dr., Faculty of Education, Islamic University In Uganda.

⁴Dr., Faculty of Education, Islamic University In Uganda.

Abstract

The decline and variations in the student performance in the different educational institutions over the years resulted into different organizations, governments, and education bodies to come up with different measures and strategies with the objective of improving student academic performance. This study's aim was to examine the impact of infrastructure development on the student performance within Vocational institutions in Makingye division, Kampala district. The study aimed to achieve the following objectives; i) To examine influence of library facilities towards student performance, ii) To examine influence of classroom facilities on student performance, and iii) To examine the impact of technological facilities on student performance within Vocational institutions in Makindye division, Kampala district. The study adopted a causal-comparative research methodology utilized only quantitative approach. Simple linear regression analysis was conducted to determine the magnitude of direction, as well as the significance of the impact of infrastructure development on student performance in Vocational institutions in Makindye division, Kampala district. The results of the study revealed that library facilities have very strong positive and statistically meaningful impact on academic outcomes in Vocational institutions in Makindye division, Kampala district. The study also discovered that classroom facilities have a strong meaningful and statistically a notable effect on student performance in Vocational institutions in Makindye division, Kampala district. Further, the study found out that technological facilities have strong a notable as well as statistically meaningful effect on student performance in Vocational institutions in Makindye division, Kampala district. Therefore, the study concludes that infrastructure development which constitutes library facilities, classroom facilities, and technological facilities bear statistically noteworthy effect on student performance within Vocational institutions in Makindye division, Kampala district in that an increase in the different forms of infrastructure development will eventually result into an improvement in student performance in Vocational institutions in Makindye division, Kampala district. The research suggested that the local government education officials in conjunction with various institutions' administrators should implement a regular maintenance schedule to ensure all the different infrastructures remain in good conditions and are equipped with the necessary resources both physical and digital resources as this may influence an improvement in the student performance in the institutions in Makindye division.

Keywords: Infrastructure development, Library facilities, Classroom facilities, Technological facilities, Student performance, and Vocational institutions.

Introduction

This research focused on examining influence of the infrastructure development on student performance within vocational institutions in Makindye division, Kampala district.

Historical Perspective

Globally, the decline and variations in the academic performance of students in the different educational institutions over the years resulted into different organizations, governments, and education bodies to come up with different measures and strategies with the objective of improving student academic performance (Cuesta, Glewwe & Krause, 2016). Global organizations such as the World Bank and UNESCO put more emphasis on the importance of educational infrastructure development in achieving global educational goals especially in developing countries to improve educational outcomes such as student performance which developments included equipping classrooms with advanced technological tools, building well equipped libraries among others to promote interactive and personalized learning experiences. This led to an evolution from basic educational facilities to modern, technologically advanced, and flexible learning environments aimed at improving student performance in different countries (Chepkonga, 2017).

Theoretical Perspective

The study was based on the Human Capital Theory proposed by Becker in 1962. The theory posits that investments in education improve the skills and knowledge of individuals, leading to increased productivity and economic growth (Petchko, 2018). Suhendi and Amineh (2018) argues that the application of this theory in the education perspective is that infrastructure development as a form of investment through improved school facilities enhances the learning environment which increase the effectiveness of education. This in turn leads to better student performance and greater future economic contribution by these individuals. This theory was adopted and applicable to this study since it provides a connection between infrastructure developments as a form of investment which influences student performance outcomes.

Contextual Perspective

The study was conducted among selected vocational institutions in Makindye division, Kampala district examining the influence of infrastructure development on student performance. This has been selected due to the limited or no existing research in this field in relation to infrastructure development and student performance in the vocational institutions which students have a significant impact on economic development of the area due to skills as well as knowledge acquired from these institutions.

Conceptual Perspective

Infrastructure development in the context of education refers to the planning, construction, improvement, and maintenance of physical facilities and resources that support learning and teaching activities within educational institutions well as student performance refers to the outcomes and contributions of the student in an academic institution to enable them attains their academic goals (Mwanda & Midigo, 2019). For the

case of this study, infrastructure development was conceptualized in terms of classroom facilities, library facilities, and technological facilities, while student performance was conceptualized in terms of test/exam scores, class attendance, dropout rates, practical skills, interaction, class participation, completion of assignments, and teamwork among others.

Problem Statement

The Ministry of Education-Uganda has developed as well as implementing a number of policies to govern the different education services and programs to ensure streamlined mode of operation and good learning environments through strategies such as infrastructure development with the objective of improving student performance in different education institutions including vocational institutions. For instance, the National Education Policy stipulates and acknowledges the establishment of relevant and appropriate academic structures with favorable learning conditions, and also emphasizes the improvement of the learning environments which the objective of improving student performance in all academic institutions in the country (Ministry of Education and Sports, 2018).

However, despite all the remarkable efforts and policies, student performance in some of the vocational institutions in Makindye division, Kampala district is still grappling characterized with poor attendance and missing of classes, dropout rates characterized with students not completing their course time, and limited engagement in classroom activities among others (Nannungi, Bataringaya & Muhwezi, 2020). Evidence indicates that at least 23.6% of the students in the different vocational institutions in Makindye division did not complete their courses on time and also did not attend classes regularly as required in 2019 (Kampala Capital City Authority, 2019). This has consequently resulted into the inability of some students to apply the acquired skills in real-life. Therefore, it is based on this evidence making current research examined the impact of infrastructure development on student performance in vocational institutions in Makindye division, Kampala district.

Objectives of the Study

Overall Objective

The overall aim of the study was to investigate the influence of infrastructure development on student performance in Vocational institutions in Makindye division, Kampala.

Specific objectives

1. To examine influence of library facilities on student performance in Vocational institutions in Makindye division, Kampala district.
2. To examine influence of classroom facilities on student performance in Vocational institutions in Makindye division, Kampala district.
3. To examine influence of technological facilities on student performance in Vocational institutions within Makindye division, Kampala district.

Study Hypotheses

The study was also guided by these various alternative hypotheses;

Ha1: Library facilities exert a statistically significant impact on student performance within Vocational institutions in Makindye division, Kampala district.

Ha2: Classroom facilities bear a statistically noteworthy impact on student performance in Vocational institutions in Makindye division, Kampala district.

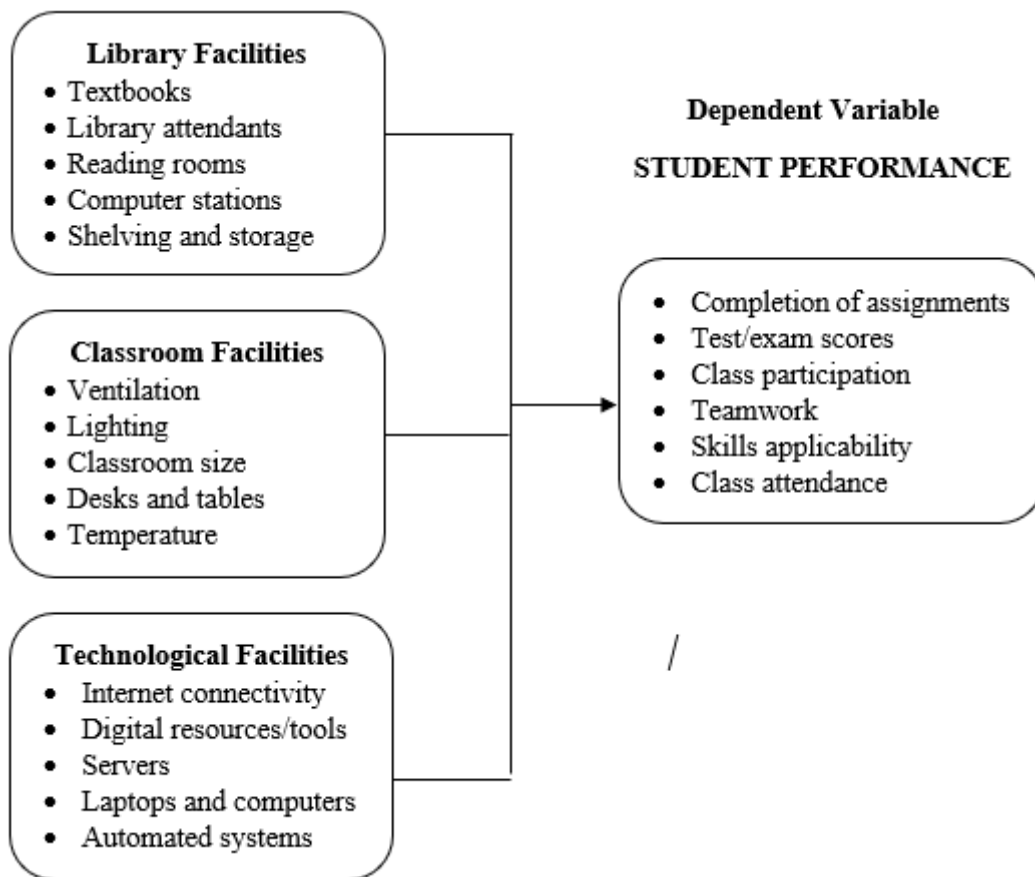
Ha3: Technological facilities have a statistically significant effect on student performance in Vocational institutions in Makindye division, Kampala district.

Conceptual Framework

The conceptual framework presents a diagrammatic illustration on the association between Infrastructure Development and Student Performance.

Independent Variable

INFRASTRUCTURE DEVELOPMENT



Infrastructure Development and Student Performance

Infrastructures such as library facilities, classroom facilities, and technological facilities contribute significantly to improving student performance through several mechanisms (Fagbohunka, 2017). Libraries provide a wide range of educational resources, such as books, journals, databases, and multimedia content and access to these resources allows students to conduct comprehensive research, complete assignments effectively, and expand their knowledge beyond the classroom curriculum which improves student performance (Fagbohunka, 2017). Additionally, Anaman, Zottor and Egyir (2022) argue that library facilities offer conducive environment for studying, often equipped with quiet areas, group study rooms, and comfortable seating. This can help students focus, reduce distractions, and engage in more productive study sessions which may influence an improvement in student performance. Similarly,

library facilities provide a wide range of educational resources, such as academic journals, databases, and multimedia content. Access to these resources allows students to conduct comprehensive research, complete assignments effectively, and expand their knowledge beyond the classroom curriculum which improves student performance (Anaman et al., 2022).

According to Assoumpta and Andala (2020) technological infrastructures or facilities provide access to computers, printers, and other technological tools that students may not have at home which has a significant influence on student academic performance. Access to technological facilities is crucial for completing assignments, conducting research, and participating in online learning activities (Assoumpta & Andala, 2020). In addition, the authors assert that technological tools such as interactive smartboards, educational Apps, and gamified learning platforms make lessons more engaging and interactive, which can increase student motivation and interest in the subject matter and this can or might improve the performance of students (Assoumpta & Andala, 2020).

Library facilities offer expertise through librarians or attendants who are trained to provide assistance to students in finding and using information effectively. Librarians can provide guidance on research strategies, information literacy, and critical evaluation of sources, which are essential skills for academic success and improving student performance (Hamburda & Ion, 2020). The authors also argue that libraries often offer additional support services such as tutoring, academic counseling, and workshops on research skills, citation, and academic writing. These services can help students develop important academic skills that are fundamental in improving their academic performance (Hamburda & Ion, 2020). Similarly, Jegede (2019) asserts that library facilities can foster a love of reading and lifelong learning. By providing access to a variety of reading materials, libraries can help students improve their reading skills, vocabulary, and overall academic performance of students.

According to Anitha (2021) classroom facilities significantly impact student performance through various factors, including the physical environment such as lighting, ventilation, temperature, furniture, availability of technology, and overall comfort. Physical environments such as lighting, ventilation, and temperature improve student concentration, reduce eye strain, illnesses, leading to better student academic performance (Anitha, 2021). Additionally, properly designed chairs and desks that support good posture can reduce discomfort and fatigue, helping students focus better during lessons which improves student engagement and understanding thus enhancing student performance (Anitha, 2021). Hong and Zimmer (2016) argued that adequate classroom size and space allows for diverse teaching methods, including group activities, hands-on experiments, and individual work thus fostering a better learning environment to improve student performance. In addition, the authors assert that classrooms with movable furniture foster flexible seating arrangements which allow for collaborative learning, group work, and interactive teaching methods which can enhance student engagement and understanding, thus leading to an improvement in student performance (Hong & Zimmer, 2016).

A study by Chanimbe and Dankwah (2021) found out that technological facilities have a positive and significant influence on student performance in public secondary schools in Ghana.

The research revealed how technological facilities have a profound impact on students' performance by enhancing learning experiences, improving access to information, and fostering engagement and collaboration. The authors argued that technological facilities provide students with access to a wide range of online resources, such as e-books and scholarly journals, educational websites, plus databases which expands students' research capabilities and allows for deeper exploration of subjects thus improving student academic performance (Chanimbe & Dankwah, 2021). In addition, the authors assert that digital

resources are often more current than printed materials, providing students with the latest information and developments in their field of study which might enhance and improve student performance (Chanime & Dankwah, 2021).

According to Balakrishnan, Ching, Jayanthi, Latiff and Nasirudeen (2019) there is a relationship between infrastructure development and student academic achievement in terms of higher grades, as well as improved information literacy and research skills. The authors argue that infrastructures such as library facilities influence students' performance by providing essential resources, a supportive study environment, technological tools, and expert assistance, all of which contribute to a more effective and enriching educational experience that leads to an improvement in the students' academic performance (Balakrishnan et al., 2019). In addition, the authors assert that well-resourced libraries with professional staff contribute positively to student achievement and performance. For example, the study found a correlation between library use and higher grades, as well as improved information literacy and research skills (Balakrishnan et al., 2019).

A study by Mgimba and Mwila (2022) examined the impact of infrastructure development on academic performance in rural public secondary schools in the Iringa district, Tanzania. The research revealed how infrastructure development bear positive and notable effect on students' academic performance in rural public secondary schools located in the Iringa district of Tanzania. This study revealed that infrastructures such as interactive whiteboards and smart boards when installed in classrooms can make lessons more engaging and interactive and this helps students understand complex concepts more easily which resultantly leads to an improvement in student performance in the different public schools in the country. The authors also assert that infrastructures such as audio systems installed in larger classrooms can ensure that all students hear the instructions clearly which is particularly important for students with hearing impairments and this can enhance these students' ability to focus, engage, and succeed academically thus an improvement in student performance at the school (Mgimba & Mwila, 2022).

Technological infrastructures such as assistive technologies which include screen reading tools, speech recognition software, and other assistive technologies assist students with disabilities in accessing educational content as well as engaging fully during classroom activities which might improve student performance (Chepkonga, 2017). In addition, the author argued that adaptive learning technologies that adapt to the individual learning pace and style of each student can provide personalized feedback and tailored learning experiences, helping students progress at their own speed and addressing their specific needs thus fostering an improvement in student performance (Chepkonga, 2017). Similarly, Hussain, Naz and Khan (2018) assert that technological tools such as Google Classroom, Microsoft Teams, and other collaborative platforms enable students to collaborate on projects, exchange resources, and interact effectively even outside of school hours. These platforms also facilitate peer-to-peer learning and enable students seek help, share ideas, and discuss topics, fostering a collaborative learning environment which might lead to an improvement in student performance (Hussain et al., 2018).

According to Mwanda and Midigo (2019) technological infrastructures such as online learning platforms make education more accessible to students who cannot attend traditional classes due to geographical, health, or other constraints. Therefore, using technology in education helps students access information wherever they are at any time and also cultivate vital digital literacy skills necessary for success in today's job market, and improve student performance in the schools (Mwanda & Midigo, 2019).

A study by Yakaboski and Nolan (2018) highlights that effectively designed school facilities greatly enhances students' learning outcomes. Students in well-maintained and adequately resourced schools

perform better academically as these can boost students' motivation, reduce absenteeism, and improve overall academic performance. The authors argue that factors such as adequate lighting, ventilation, comfortable classroom temperatures, and safe-clean facilities contribute positively to student achievement in rural public schools (Yakaboski & Nolan, 2018). Additionally, they also assert that smaller class sizes and ergonomic furniture are also associated with better student engagement and achievement. These elements reduce distractions and physical discomfort, allowing students to focus better on their studies which may influence student academic performance in rural public schools (Yakaboski & Nolan, 2018).

Methodology

The Research design

This study employed a causal-comparative research approach coupled with only a numerical research method. This framework is concerned with establishing a cause-effect relationship among variables. It enables in determining assessing the impact of the independent variable on the dependent variable as used in this study (Lawrence, 2023). Therefore, this research design enabled the researcher in examining the effect of infrastructure development on student performance in vocational institutions in Makindye division. A quantitative approach was fundamental in obtaining information in numerical form that was used to examine study phenomenon.

Population of Interest and Sample Size

A study population consists of a group of individuals with specific traits of interest from whom study sample is selected (Majid, 2018). The study population comprised of directors and teachers from the different selected vocational institutions in Makindye division, Kampala district from which a sample was selected. The sample size comprised of 30 respondents constituting of a total of 5 directors and a total of 25 teachers selected from each of the five selected vocational institutions in Makindye division, Kampala district to provide quantitative data that was used to provide answers to the study objectives.

Sampling Procedure

Sampling refers to a systematic method of choosing a representative sample from the target population (Singh & Masuku, 2017). The researcher employed convenient sampling to select participants who took part in the research. Convenient sampling involves the researcher selecting individuals who are readily available and easily accessible and this was used to select both the institution directors and teachers from the different selected vocational institutions in Makindye division to participate in the study so as to generate quantitative data.

Data Collection Methods

Survey Method Using Questionnaires

This method involves obtaining information through a set of questions and prompts designed to collect information from participants (Anokye, 2020). This survey method was vital in order obtaining uniform information which ensures the comparability of data using questions which are structured and easy to understand. Thus, this method was used as it enabled the researcher to obtain and collect data from the respondents in the possible shortest time.

Data Collection Instruments

Structured Questionnaire

A structured questionnaire is a tool used to collect information from respondents comprising of closed-

ended responses to the questions from which respondents are required to choose (Kuphanga, 2024). The research utilized structured questionnaires to gather numerical data from participants which comprised of closed-ended questions and encoded answers that were self-administered to the respondents in the different selected vocational institutions. The structured questionnaires were used since they require little time and gather a lot of information on the phenomenon under study.

Data Analysis

Quantitative data analysis helps the researcher to measure, analyze and understand a phenomenon through running statistical tests and descriptive analysis. The study employed both descriptive and linear regression analysis methods in analyzing the quantitative data collected. Descriptive analysis was used when analyzing respondents’ demographics. In order to examine the influence of the independent variable on the dependent variable, linear regression analysis was used to give empirical evidence on the study hypotheses at a 0.05 level of significance. Linear regression analysis is important in research in examining the strength regarding the relationship between outcome and predictor variables (Maulud & Abdulazez, 2020). Linear regression analysis involved the use of simple linear regression models which comprised of both the independent and dependent variables.

Ethical Consideration

There was acquiring of a cover letter from Department of Post Graduate Studies at Islamic University in Uganda before undertaking the study as a prerequisite to obtain permission to gather the required data for research in the different institutions. The also sought for respondents’ consent to participate within the research and respondents were thoroughly briefed on the objectives, procedures, and benefits and participation was voluntary without any coercion.

The researcher additionally ensured the privacy of respondents by confidentiality compliance through safeguarding personal information and ensuring that data is anonymized where possible. The researcher also conducted their work honestly and transparently, reporting findings accurately and acknowledging any limitations or conflicts of interest. Additionally, all the participants were treated with dignity and respect including recognizing their autonomy.

Study Findings

The findings presented in this chapter include; descriptive statistics on the demographic composition of the respondents and linear regression results.

Findings on the Demographic Compositions

The study assessed the demographic compositions of the individuals who took part in the research from different selected public secondary schools in Buikwe district and the results are shown in Table 1;

Table 1: The Demographic Composition.

Demographic Composition			
Categorization	Items	Frequencies	Percentage-(%)
Gender	Female	11	36.7
	Male	19	63.3
	Total	30	100.0
Age Category	25-30 years	4	13.3
	31-35 years	11	36.7
	36-40 years	9	30.0

	Above 40 years	6	20.0
	Total	30	100.0
Level of Education	Diploma	8	26.7
	Bachelors	18	60.0
	Masters	4	13.3
	Total	30	100.0
Marital Status	Single	7	23.3
	Married	21	70.0
	Divorced	2	6.7
	Total	30	100.0
Period of Work at the Institution	1-2 years	3	10.0
	3-5 years	16	53.3
	Above 5 years	11	36.7
	Total	30	100.0

Source: Primary Data (2024)

Above results indicate that most of the participants in the study 19 (63.3%) were males compared to 11 (36.7%) of the participants who were females. The results also disclose that the bigger proportion of the participants 11 (36.7%) were aged 31-35 years, followed by 9 (30.0%) of the participants who were aged 36-40 years, then 6 (20.0%) of the participants who were aged above 40 years, and the least proportion 4 (13.3%) of the participants were aged 25-30 years.

Additionally, the results revealed that majority 18 (60.0%) of the participants had attained a bachelors' level of education, followed by 8 (26.7%) of the participants who had attained a diploma level of education, and only a few 4 (13.3%) of the participants had attained a master's level of education. Still, the study indicates that a bigger proportion 21 (70.0%) of the participants were married, followed by 7 (23.3%) of the participants who were single, and only a handful 2 (6.7%) of the participants were divorced. Further, the study revealed that majority 16 (53.3%) of the participants had worked or taught at the respective institution for a period of 3-5 years, followed by 11 (36.7%) of the participants who had worked or taught at the respective institution for a period of above 5 years, and the least proportion 3 (10.0%) of the participants had worked or taught at the respective institution for a period of 1-2 years.

Findings based on the study objectives

This section displays the results in relation to specific objectives.

Influence of Library Facilities on Student Performance in Vocational Institutions in Makindye Division, Kampala District

The research aimed to examine the influence of library facilities on student performance in Vocational institutions in Makindye division, Kampala district. The findings are presented using linear regression results shown in Table 2.

Table 2. Regression Findings on Influence of Library Facilities on Student Performance in Vocational Institutions in Makindye Division, Kampala District

Model Summary						
Model	R	R Square	Adjusted R Square		Std. Error of the Estimate	
1	.864 ^a	.747	.738		.37747	
a. Predictors: (Constant), Library Facilities						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.695	.352		1.974	.000
	Library Facilities	.820	.089	.864	9.244	.000
a. Dependent Variable: Student Performance						

Source: Primary Data (2024)

These regression findings above indicate that library facilities have a very strong positive and statistically significant influence on student performance in Vocational institutions in Makindye division, Kampala district ($\beta=0.864$, P-value=0.000) at a 5% level of significance. The regression findings indicate that a unit increase in library facilities significantly results into an improvement in student performance by 86.4%. The results imply that as library facilities increase, it results into an improvement in student performance in Vocational institutions in Makindye division, Kampala district.

The model summary findings specify that coefficient of determination (Adjusted R-square) was 0.738, it indicates that library facilities explain 73.8% of the total variations in student performance in Vocational institutions and the remaining 26.2% of the variations are explained by other factors. This implies that library facilities prominently and significantly influence student performance in Vocational institutions in Makindye division, Kampala district. Therefore, to improve student performance there has to be an increase in the development of library facilities in Vocational institutions in Makindye division, Kampala district.

Influence of Classroom Facilities on Student Performance in Vocational Institutions in Makindye Division, Kampala District

This study also aimed to examine the influence of classroom facilities on student performance in Vocational institutions in Makindye division, Kampala district. The findings are presented using linear regression analysis in Table 3.

Table 3: Regression Findings on the Influence of Classroom Facilities on Student Performance in Vocational Institutions in Makindye Division, Kampala District

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.696 ^a	.485	.467	.42993

a. Predictors: (Constant), Classroom Facilities						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.944	.401		4.847	.000
	Classroom Facilities	.528	.101	.696	5.222	.000

a. Dependent Variable: Student Performance

Source: Field Primary Data (2024)

From the above Table 3, the regression findings indicate that classroom facilities exert a strong, positive, and statistically significant impact on student achievement in Vocational institutions in Makindye division, Kampala district ($\beta=0.696$, P-value=0.000) at a 5% level of significance. The regression findings indicate that a unit increase in classroom facilities significantly results into an improvement in student performance by 69.6%. The results imply that as classroom facilities increase, it results into an improvement in student performance in Vocational institutions in Makindye division, Kampala district.

The model summary findings specify how coefficient of determination (Adjusted R-square) was 0.467, hence indicates how classroom facilities explain 46.7% of the total variations in student performance in Vocational institutions and the remaining 53.3% of the variations are explained by other factors. This implies that classroom facilities moderately and significantly influence student performance in Vocational institutions in Makindye division, Kampala district. Therefore, to improve student performance there has to be an increase in the development of classroom facilities in Vocational institutions in Makindye division, Kampala district.

Influence of Technological Facilities on Student Performance in Vocational Institutions in Makindye Division, Kampala District

The research additionally aimed to investigate how technological resources affect student performance in vocational schools within the Makindye division of Kampala district. The results are illustrated through linear regression analysis presented in Table 4.

Table 4: Regression Findings on Influence of Technological Facilities on Student Performance in Vocational Institutions in Makindye Division, Kampala District

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.602 ^a	.362	.340	.47817		

a. Predictors: (Constant), Technological Facilities						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.130	.469		4.545	.000
	Technological Facilities	.481	.118	.602	4.060	.000

a. Dependent Variable: Student Performance
--

Source: Field Primary Data (2024)

According to Table 4, the regression results demonstrate that technological resources exert a substantial, positive, and statistically significant effect on student performance in vocational institutions in the Makindye division, Kampala district ($\beta=0.602$, P-value=0.000) at a 5% level of significance. The regression findings indicate that a unit increase in technological facilities significantly results into an improvement in student performance by 60.2%. The results imply that as technological facilities increase, it results into an improvement in student performance in Vocational institutions in Makindye division, Kampala district.

The model summary findings specify that the coefficient of determination (Adjusted R-square) was 0.340, indicating how technological facilities explain 34.0% of the total variations in student performance in Vocational institutions and the remaining 66.0% of the variations are explained by other factors. This implies that technological facilities discreetly and significantly influence student performance in Vocational institutions in Makindye division, Kampala district. Therefore, to improve student performance there has to be an increase in the development of technological facilities in Vocational institutions in Makindye division, Kampala district.

Conclusions

The study concludes that infrastructure development which constitutes library facilities, classroom facilities, and technological facilities bear statistically considerable impact on student performance within Vocational institutions in Makindye division, Kampala district in that an increase in the different forms of infrastructure development will eventually result into an improvement in student performance in Vocational institutions in Makindye division, Kampala district.

Recommendations

The research advised that vocational institutions' administrators together with stakeholders ought to provide classrooms that have up-to-date technology such as interactive whiteboards, projectors, and high-speed internet as these play a significant role and create environments that enhance student learning and performance in the institutions in Makindye division.

The research suggests that centralized government education officials in conjunction with various institutions' administrators should implement a regular maintenance schedule to ensure all the different infrastructures remain in good conditions and are equipped with the necessary resources both physical and digital resources as this may influence an improvement in the student performance in the institutions in Makindye division.

The study also recommends that the institution administrators should provide students with monitored access to computers, tablets, laptops, and other devices to support digital learning and as well invest in robust IT infrastructures as these may enhance the student learning thus leading to an improvement in student performance in the different institutions in the area.

References

1. Anaman, P. D., Zottor, D. M., & Egyir, J. K. (2022). Infrastructural Challenges and Student Academic Performance: Evidence from a Developing Nation. *International Journal of Innovative Science and Research Technology*, 7(11), 189-199.

2. Anitha, M. (2021). *Influence of School Infrastructure on Students' Academic Performance in Rural Public Secondary Schools in Iringa District, Tanzania*. Dar es Salaam, Tanzania: The Open University of Tanzania.
3. Anokye, M. A. (2020). Sample Size Determination in Survey Research. *Journal of Scientific Research and Reports (JSRR)*, 26(5), 90-97.
4. Assoumpta, U. I. & Andala, H. O. (2020). Relationship between School Infrastructure and Students' Academic Performance in Twelve Years Basic Education in Rwanda. *Journal on Education*, 3(1), 60-74.
5. Balakrishnan, S., Ching, A. L. S., Jayanthi, S. V., Latiff, N. A. A., & Nasirudeen, A. M. A. (2019). Factors Contributing to Academic Performance of Students in a Tertiary Institution in Singapore. *American Journal on Education and Research*, 2(9), 752-758.
6. Chanimbe, T. & Dankwah, K. O. (2021). Influence of School Infrastructure on Students' Performance in Public Secondary Schools in Ghana. *Journal on Sustainable Development Studies*, 52(4), 599-630.
7. Chepkonga, M. C. (2017). Influence of Learning Facilities on Provision of Quality Education in Early Childhood Development Centres in Kenya. *International Journal of Education and Research*, 5(6), 15-26.
8. Cuesta, A., Glewwe, P., & Krause, B. (2016). School Infrastructure and Educational Outcomes: A Literature Review, with Special Reference to Latin America. *Economica*, 17(1), 95-130.
9. Fagbohunka, A. S. (2017). Infrastructural Facility and the Students' Academic Performance: A Critique. *Indonesian Journal of Geography*, 49(1), 11.
10. Hamburda, R. O. & Ion, C. E. (2020). The Impact of School Infrastructure on the Performance of Pupils. *LUMEN Provocational Journal*, 10, 362-367.
11. Hong, K. & Zimmer, R. (2016). Does Investing in School Capital Infrastructure Improve Student Achievement? *Economic and Education Review*, 53(1), 143-158.
12. Hussain, M., Naz, A., & Khan, W. (2018). Assessing the Consequential Role of Infrastructure Facilities in Students' Academic Performance in Pakistan. *International Journal of School Education*, 3(2), 464-466.
13. Jegede, D. (2019). The Impact of School Management Practices on Educational Performance: Evidence from Public Schools in Sao Paulo. *Economic and Education Review Journal*, 48, 1-15.
14. Kampala Capital City Authority. (2019). *Statistical Abstract for Kampala City*. Kampala, Uganda: Kampala Capital City Authority (KCCA).
15. Kuphanga, D. (2024). *Questionnaires in Research: Their Role, Advantages, and Main Aspects*. ResearchGate.
16. Lawrence, F. P. (2023). *Research Methodology: Causal-Comparative Research*. Phoenix: University of Phoenix.
17. Majid, U. (2018). Research Fundamentals: Study Design, Population, and Sample Size. *Undergraduate Research in Natural and Clinical Science and Technology (URNCST) Journal*, 2(1), 1-7.
18. Maulud, D. H. & Abdulazeez, A. M. (2020). A Review on Linear Regression Comprehensive in Machine Learning. *Journal of Applied Science and Technology Trends*, 1(4), 140-147.
19. Mgimba, A. E. & Mwila, P. M. (2022). Infrastructural Challenges Influencing Academic Performance in Rural Public Secondary Schools in Iringa District, Tanzania. *Journal of Research Innovation and Implications in Education*, 6(2), 17-24.

20. Ministry of Education and Sports. (2018). *Education System in Uganda: Policies and Regulations*. Kampala, Uganda: Government of the Republic of Uganda.
21. Mwanda, G. & Midigo, R. (2019). *Influence of School Infrastructure on Students' Performance in Public Secondary Schools in Kajiado County, Kenya*. Nairobi, Kenya: University of Nairobi.
22. Nannungi, A., Bataringaya, D., & Muhwezi, W. W. (2020). *Assessing the Management and Administration in Vocational Institutions and the Implications for the Education Service Delivery and Utilization: Evidence from the Five Divisions in Kampala District*. Kampala, Uganda: Advocates Coalition for Development and Environment (ACODE).
23. Petchko, K. (2018). Human Capital Theory and Theoretical Frameworks: An Overview . *Journal on Economics and Public Policy*, 16(1), 1-9.
24. Singh, A. S. & Masuku, M. B. (2017). Sampling Techniques and Determination of Sample Size in Applied Statistics Research: An Overview. *International Journal of Economics, Commerce and Management*, 2(11), 12-22.
25. Suhendi, A. & Amineh, R. J. (2018). Human Capital Theory: Implications for Human Resource Development. *International Journal on Human Resource Development*, 7(4), 545-551.
26. Yakaboski, T. & Nolan, K. (2018). *Influence of School Infrastructure on Academic Performance in Public Schools in the Rural Location-Meru County*. Nairobi, Kenya: The University of Nairobi.