

SCHOOL INFRASTRUCTURES AND STUDENTS' PERFORMANCE IN KAYONZA DISTRICT, RWANDA

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Abstract: The study was on school infrastructures and students' performance in Kayonza district, Rwanda. The study was conducted using both quantitative and qualitative approaches. The sample size of the population included 1 DEO, 3 SEO, 8 Headteachers, 8 PTAs, 32 teachers, and 47 students. The study indicated that the schools of 9YBE program in Kayonza district lacked enough facilities such as classrooms, toilets, offices, laboratories, libraries, water, electricity, desks to support the teaching and learning activities and this affected the performance of those schools. Data were collected using instruments like questionnaires, observation checklist and interviews. Data were described and presented using tables and analysed using percentages in drawing conclusions and recommendations. The study found that the inadequate or lack of basic infrastructures which included roads, electricity, water, buildings, classrooms, desks, toilets, offices, laboratories, libraries and trading centers affected the performance of students under 9YBE schools in Kayonza District. The study recommended that more libraries and laboratory materials, sufficient science and technical equipments materials, adequate supply of high quality teaching and learning materials, access to safe water and electricity, were required in improving the students' and teachers' performance in all schools.

ACRONYMS:

9YBE:	Nine Years Basic Education.	12 YBE:	Twelve Years Basic Education
A:	Agreed	CAL:	Computer-Aided Learning
CBT:	Computer Baised Training	D:	Disagreed
DEOs:	District Education Officer	HTs:	Headteachers
SA:	Strongly Agreed	SD:	Strongly Disagreed
SEOs:	Secretary Education Officers		

1. DEFINITION OF KEY CONCEPTS

- Concept of academic performance

Academic performance refers to a successful accomplishment or performance in a particular subject area and is indicated by grades, marks and scores of descriptive commentaries. Academic performance also refers to how students deal with their studies and how they cope with or accomplish different tasks given to them by their teachers in a fixed time or academic year. Furthermore, academic performance is a performance on task with measures including comprehension, quality and accuracy of answers of tests, quality and accuracy of problem solving, frequency and quantity of desired outcome, time or rate to solution, time on task, level reasoning and critical thinking, creativity, recall and retention, and transfer of tasks.

- Low academic performance:

This refers to a situation in which the pupil performs below his or her potential in both class tests and subsequent national exams resulting in low levels of knowledge acquisition that fall short of what is required to successfully complete any level of education in the country. The concept is interchangeable with poor academic performance in this study.

-Nine years basic education in Rwanda

Nine Year-Basic Education program In Rwanda is a government program where by all learners do compulsory primary level (6 years) plus lower secondary level (ordinary level) for free. It is aimed at enabling every Rwandan child to attain lower secondary education in order to prevent a high rate of primary drop-out.

The primary purpose of the teaching and learning process is to bring a desirable change in the learner's behavior through critical thinking. This process does not take place in a vacuum but rather in an environment structured to facilitate learning. The environment of an organization means all elements relevant to its operation and the teaching and learning materials constitute the major components of both direct and indirect action elements in the environment of learning. The researcher feels that any teaching and learning situation requires a good environment where the learners learn using the teaching aids with the guidance of the teacher.

-Assessment

The word assessment comes from the root word assess which means to determine the importance, the size, or the value of a particular action. Therefore an assessment of teaching and learning materials is an important step in planning for an education service in communities since it helps establish demand, as well as indicating any problems or constraints (Boyden , 1996).

-Performance

Performance refers to the average achievements of the learners at the end of a formal schooling. According to O'Neill (1990), Littlejohn, (1989), performance is a reliable means of evaluating the level of mastery and achievement to the given activity. It is also a process of executing the duties assigned to workers and employers. The appreciation and the quality of a given examination can be well determined by performance. Performance can be good or bad. However good performance involves being punctual at work, commitment, ability to cope with an assigned task like tests and exams, while poor performance in class involves failing exams, tests, inability to cope with dictations and learning indicators.

-School infrastructure

School infrastructure refers to the indirect teaching support facilities such as offices, cafeteria, acoustics, toilets, laundry, mowers, residential halls, common rooms, cleaning materials ground and similar items satisfy the individual's physical and emotional needs. They are used to increase instructional effectiveness, improve the cleanness, orderliness and safety of facilities, reduce the operational cost and life cycle cost of a building, extending the useful life of a building, increasing efficiency and effectiveness of the staff and students, improve building appearance, use data collection and analysis for decision making (Asiabaka, 2008).

2. STATEMENT OF THE PROBLEM

The critical challenge for countries of Sub-Saharan Africa (SSA) is to achieve over a short span of time what took Europe over a century: the transition from an elitist tradition in education to effective democratization, an expanded basic education in terms of access, participation, achievement and decision making. Elitism is very strongly entrenched and educational transformation requires the vision and political ability to think creatively about innovative strategies to confront vested interests and generate support for far reaching reforms over time. Governments with the help of technical partners have provided suitable and sustainable strategies to adapt educational policies and practices to change the learner's profile.

The provision of school infrastructure make the school open or keep operating. These include buildings , infrastructures, desks, textbooks, laboratories materials and financial facilities.

Before 2009, the number of students in secondary level was limited and many of Primary Level Completers became street children, girls were early married and this led to population growth, unemployment, theft, sufferance from child labor working in tea plantations while others who were poor and weak dropped out of school because there was no interest in studying. Therefore the policy of introducing Nine Years Basic Education by adding three years of lower secondary to Primary Level schools came as an answer to such problems encountered by pupils who were in primary schools.

However, there are still challenges in implementing the policy of Nine Years Basic Education. From the beginning, there were no adequate infrastructure to accommodate all the students. Primary schools resorted to double shifting in order to accommodate the secondary level students. The classrooms became overcrowded due to large numbers of students.

The school infrastructure provided in the school of Nine Years Basic Education is to be assessed to identify their influence on that program. However, in Kayonza district as a poor and remote area, this problem of the school infrastructure appears as big challenge to the schools which are preparing students to compete with students from other districts with good facilities. Thus, warranting for an investigation of the school infrastructure on students' performance in Kayonza district.

3. ROLE OF SCHOOL INFRASTRUCTURES ON STUDENTS' PERFORMANCE

Basic education provides the foundation for all future education and learning. Its goal concerns those in the pre-primary school-age population, whether enrolled in school or not, and to produce children who are happy with themselves and with others, who find learning exciting, develop inquiring minds, begin to build up a storehouse of knowledge about the world and more importantly, seek more knowledge they use and develop throughout their lives.

To conduct a systematic formal basic education, Jideowolabi (2005) suggests that infrastructural materials such as school buildings, furniture and fittings, libraries, audiovisuals and laboratories need to be in place, and a regular allocation of resources, including textual, stationeries, chemicals and chalkboards tools are essential.

Schools exist for the purpose of teaching and learning. Infrastructural materials are deployed for this purpose and they are provided for staff and students to optimize their productivity in the teaching and learning process. Those school infrastructures consist of all types of buildings for academic and non-academic activities, equipment for teaching and learning, areas for sports and games, landscape, farms and gardens including trees, roads and paths. Others include furniture and toilet facilities, lighting, acoustics, storage facilities and packing lot, security, transportation, ICT, cleaning materials, food services, and special facilities for the physically challenged persons (Asiabaka, 2008).

The realization of the transfer of knowledge does not only take place in the four walls of the classroom from the teacher to the students but through discovery, exploration and interaction with the internal and external environment. These have necessitated the creative and innovative development of teaching and learning facilities that reflect changes (Asiabaka, 2008). Schools exist to serve socio-economic and political needs of the ever-changing society; consequently, they are in constant interaction with their external environment. They receive inputs from the external environment in the form of human and material resources, process them into the society as finished products and services. The quality of the products bears a direct relationship with the quality of the materials deployed in the process of the production.

School infrastructures constitute the major components of both direct and indirect action elements in the environment of learning. Several studies have shown that a close relationship exists between the physical environment and the academic performance of students. Nwagwu (1978) maintained that the quality of education that children receive bears a direct relevance to the availability or lack of physical facilities and overall atmosphere in which learning takes place.

MINEDUC (2009) published the standards of facilities that must be provided to schools in order to facilitate the quality of nursery, primary and secondary education. Those standards gather all aspects of resources. For buildings and equipment, a school of 9 Years Basic Education must have at least 6 rooms for primary and 3 rooms for ordinary level, with dimensions of 9 m x 7 m each, windows on each room that allow in free flow of sufficient fresh air and light, with a capacity of 46 pupils. It must have the headteacher's office, a secretary office, director of study's office, a staff room, separate toilets for male and for female staff, library with a reading space for students, standard laboratories which correspond with the number of science subjects and time allocation for each subject taught, a computer room with a capacity of 46 students, headteacher's house, adequate separate toilet for boys and girls (one toilet room per 40 students), cemented urinals for boys, a fence, electricity, water tanks with taps and two waste pits.

Considering the quality standards stated by MINEDUC (2009), a 9 YBE school should have appropriate and sufficient equipment for the level of students. It should have enough desks, not more than 2 students per desk, teachers' chairs and tables, chalk boards in classrooms, cupboards in offices and classrooms and office equipment. The headteacher and teachers should have computers at their disposal. The school should have a printer, sport equipment, supply of materials for cleaning and washing, waste bins in classrooms and any other place where they are necessary, and containers for keeping safe drinking water. The standards suggest that the school should have appropriate and sufficient teaching and learning materials.

In educational management, the most fundamental problem is lack of policy guidelines for infrastructural development in schools. In some schools, there are inadequate classrooms, staff offices, laboratories and workshops, libraries, study areas while in others, these facilities are adequately provided. It therefore imperative that the different levels of government should address the issue of development and implementation of minimum standards in all schools. (Kalisa, 2011)

Studies over the years have shown that classroom control, discipline, learning atmosphere of schools can be occasioned by the nature and level of school infrastructures provided and these equally have influence on academic performance (Ajayi, 1998; Adamu, 1998 cited by Dike, 2002).

The need for an effective classroom organization must be emphasized as this helps to bring out effective learning. To achieve this, the infrastructures of school should be well built to organize effective learning through conducive classroom atmosphere as proper arrangement of the classroom and paving way for adequate supervision. Therefore classroom arrangement has a direct bearing on students' learning and performance.

Akinade (1999) opines that classroom control, discipline, teacher's self-control, orderliness, obedience and power of cooperation in the schools discipline are among the factors for the attainment of the end results in the teaching and learning process. He therefore, concluded that the learning environment should have a good physical surrounding and physical facilities, which encourage the pupils to concentrate on their studies. It was noted that where classroom is badly located with poor ventilation or lighting sub-standard, pupils may develop negative attitude towards their studies (Dike, 2002 and Awoyele, 2005).

It is believed that where physical and teaching facilities are provided and are particularly adequate, teaching and learning are expected to be faster and more permanent because of the feeling of the satisfaction of the conducive learning atmosphere provided. Philips (1997) equally points out this fact when he asserts that school climate influences teachers as well as pupils work behavior and performance in schools.

Learners therefore must be taught under good conditions so that learning can effectively take place. The availability of adequate materials is expected to provide schools with conducive teaching and learning atmosphere (Dike, 2002; Gbadamosi & Adeyemi, 2003 & Edun, 2005).

The lack of infrastructures in a school setting contributes to teacher job dissatisfaction, and this leads to attrition. In Ghana, a large percentage of new teachers disliked teaching in rural areas. Most teachers hated teaching in areas with no basic needs such as water, electricity, modern classrooms, roads and desks (Tapper, 1995). Similarly, many factors contribute to the quality of the school building and in turn, affect the quality of teacher life and educational outcomes. For example, poor indoor air quality (IAQ) is widespread and many schools suffer from "sick building syndrome" which in turn increases student absenteeism and reduces student performance. Since the current student-focused asthma, studies show that students lose considerable school time because of the poor conditions of schools; it is not surprising to find that poor indoor air quality also affects teachers' health. In that study conducted in America two-thirds of Washington teachers surveyed reported poor indoor air quality in their school (Tapper, 1995).

Another area in which research has linked school facilities to teacher performance is thermal comfort. Lowe (1990) found out that the best teachers in the country (winners of State Teachers of the Year awards) emphasized their ability to control classroom temperature as central to the performance of both teachers and students. The researcher feels that the classroom arrangement and environment are pertinent in the teaching and learning situations.

4. METHODOLOGY

The study was across sectional survey design where out of total population of 132, a population sample of 99 people was selected, using stratified and random sampling techniques, and it included 1 DEO, 3 SEO, 8 Headteachers, 8 PTAs, 32 teachers, and 47 students. Data were collected using questionnaires addressed to teachers and students due to their big number and interviews addressed to DEO, SEO's, Headteachers and PTA's and observation. This study was conducted in educational context and this gave detailed information about the provision of teaching and learning materials like textbooks, computers and infrastructures.

5. FINDINGS, DATA PRESENTATION AND INTERPRETATION

Views of students on the influence of school infrastructures on their performance

The study collected the opinions of the students on the influence of school infrastructures on their performance as presented in the table below.

Table on Influence of school infrastructures on students' performance

Item of the study / Statements	Students responses			
	SA	A	D	SD
The school desks at my school are enough to accommodate all students.	60% 28	34.4% 16	4.5% 2	1.1% 1
I use the school laboratories to learn sciences.	4.5% 2	9.8% 5	38.3% 18	47.4% 22
The laboratories of my school have enough teaching and learning materials.	2.4% 1	8.3% 4	38.6% 18	50.7% 24
I use the school library in my learning activities.	3.6% 2	1.8% 1	10.4% 5	84.3% 39
There is enough air in my class and in the laboratory	15% 7	43% 20	17% 8	25% 12
My school has enough electricity and water.	1.8% 1	1.8% 1	12.5% 6	84% 39

This table above shows that 60% of the students strongly agreed that the desks in classrooms are enough for the number of students, 34.4% agreed, 4.5% disagreed and 1.1 % strongly disagreed respectively with the statement.

Similarly, only 4.5% of the students strongly agreed and 9.8% agreed that they use the school libraries to help their learning activities while 38.3% of the students disagreed and 47.5% strongly disagreed with the statements in question.

This means that a great number of the students in general did not use the school libraries. The study found out that schools lacked libraries for the students and teachers to use. The schools did not have libraries because they lacked enough text books and reading rooms. They had only book stores without space reserved for students reading. This affected their reading culture at school as well as performance in final exams.

On the quantity and quality of books in library, many students disagreed or strongly disagreed with the statement that there are enough books in library as reflected from 10.4% and 84.3% of respondents who disagreed with the statements. Precisely only 2.4% of the students strongly agreed and 8.3% agreed that they are enough books in the school libraries, while 38.6% of students disagreed and 50.7% strongly disagreed respectively.

The study observed that the majority of schools did not have enough textbooks in their libraries and stores. In the interview with the headteachers, they confirmed that they lacked enough books in their libraries due to their limited financial resources and supports from well wishers. The little books they had were old and written in French instead of being in English, the new language of instruction since 2009.

Concerning the use of school laboratories, only 3.6% strongly agreed and 1.8% agreed while 10.4% disagreed and 84.3% strongly disagreed with the particulars in question. Schools therefore lacked laboratories to teach and learn sciences and this also affected their performances.

In the interview with the Headteachers all of them (8 Headteachers) confirmed that their teachers lacked laboratories though 50% of them got the Kit sciences for teaching sciences. Kit sciences are the boxes that contain some materials to use in chemistry, biology and physics. Notwithstanding thus, a great number of kit sciences are still closed because the teachers of sciences in 9YBE are not trained on how to use them.

Responding to the situation of availability of enough air in class, the majority of students confirmed that air is enough in classroom while a negligible number of students 42% doubted the quantity of air in their classroom. Generally a total of 15% strongly agreed, 43% agreed, 17% strongly disagreed and 25% agreed with the statement in question. Therefore

58% of the respondents agreed with the statement, while 42% disagreed. The study observed that most schools structures had enough air in their classrooms, libraries and offices.

However in some schools, buildings are not finished, have no windows, doors, ceilings and some have leaking roofs. In some areas, classrooms are not wide enough and students are compacted. These students are affected in their learning process, suffer from different coldness, diseases such as coughing, shivering, asthma and flu or feel not comfortable because of lack of enough oxygen. The study observed that this leads to an increase of body temperature, transpiration and tiredness in classrooms among students hence affecting their performance.

On the availability of water and electricity or power in schools, only 1.8 % of the students strongly agreed while 12.5 % disagreed and 84% strongly disagreed with the particulars in question.

It was found out that schools really did not have water and electricity. Students without basic school infrastructures such as water and electricity had poor performance as compared to those with adequate services. Although in 9 YBE are not boarding schools, students need electricity to learn practical subjects like physics and computers. Without electricity they could not learn by using internet at schools, watching television, listening to radio, watching films related to different subjects they are taught. Schools without water exposed students to dirtiness in classrooms and outside it especially in their toilets and this affected the students' health. More still water was necessary in the laboratory for dissolving solutions, disposal of chemicals, treatment of burns in case of acid corrosions, cleaning of laboratories, apparatuses, and also in experimental work for instance in biology and chemistry. These have an influence on the students' performance in class and final exams.

Views of teachers on the influence of school infrastructures on students' performance

The study collected the opinions of the teachers on the influence of school infrastructures on students' performance as presented in the table below.

Table on the influence of school infrastructures on students' performance

Items of the study/ Statements	Teachers responses			
	SA	A	D	SD
My school infrastructures facilitate teaching-learning activities.	0% 0	25.5% 8	74.5% 24	0% 0
My school accesses enough and sustainable infrastructures like buildings, water, electricity, classroom, offices, library, laboratory, ICT room, latrines and playgrounds.	0% 0	9% 3	72% 23	19% 6
My school has adequate accommodations for the teachers.	0% 0	0% 0	33.6% 11	66.4% 21
I am proud of my school infrastructures.	8% 3	14% 4	42% 13	36% 12
My school has well equipped library and laboratories.	4% 1	12% 4	38% 12	46% 15

The table above shows that 74.5 % of teachers said that the school infrastructures do not facilitate the teaching activities while only 25.5% of the teachers agreed with the statement.

These findings implied that the school infrastructures are very few and in poor state. Through observation, the schools didn't have the libraries and enough space for students to read the books in their classes. The infrastructures are very poor. The ancient rooms didn't have enough light and air for the number of all students. Many schools did not have water and toilets for the students, had no rooms for girls who get problems at schools, no sick room for first aid students who get sick in general.

The researcher observed that a small house was being built by students themselves at in one of the schools in Kayonza District in order to get where to put off and on their uniforms before and after the sports time. It is used by the students who come from very far to put on their uniforms in the morning because if they put them on they arrive at school very dirty.

Similarly, the majority of schools (70%) do not have enough grounds to help all students play or participate in cocurricular activities like games and sports. The schools can not develop games without playgrounds and these are missing in most schools of Kayonza district.

The table also shows that a great number for students did not agree that they have access school infrastructures such as water, electricity, classroom, offices, library, laboratory, ICT room, latrines and play grounds. Only 9% of the teachers agreed that the schools have enough infrastructures while 72% disagreed and 19% strongly disagreed with the statement in question.

This implies that the school infrastructures such as water, electricity classroom, offices, library, laboratory, ICT rooms, latrines and playgrounds are not sufficient to the number of students. Through the interview with the headteachers the existing school buildings were not adequate for teachers and students. Many of the schools have built additional rooms to accommodate students in learning.

For example at one of the school taken as a case study in Kayonza District, a new classroom building being used by students has three rooms occupied by students of lower secondary level. Some of the rooms are not yet paved, and some doors and windows are not yet fixed.

The latrines are not enough and the available ones are not in good condition and, no urinals. One toilet is shared by around 93 students. The small building has four small rooms used as latrines. They are not adequate and they are used by over 273 students. This makes the students to queue in front of toilets.

It was found that 78% of the schools did not have enough grounds to help children, enthusiastic with sports. Each school had one room as office used by both the Headteacher and the accountant secretary. Other administrators like animators charged with sports and students discipline do not have offices. The schools didn't have enough libraries, laboratories, ICT rooms and electricity. No school had generators and 40% of headmasters with laptop had their chargings from the trading centres.

On teachers' accommodation all teachers disagreed with the statement as reflected by 33.6% and 66.4% who strongly disagreed with the statement. From the findings, schools do not provide accommodation to their teachers. The headteachers lacked financial facilities to provide accommodations for their teachers.

Teachers arrived at school very late thus delaying or being late for classes too. When the teachers come late every day, the school would not perform well and this leads to the poor performances in class and in final exams. Teachers have no adequate time to make preparations, lesson notes and organize other teaching aids in the learning situations.

On whether teachers are happy or not on accommodation, 78% were not satisfied with school infrastructures and 8% strongly agreed, 14% agreed while 42% strongly disagreed and 36% disagreed respectively. This means that teachers were not happy with infrastructures put at their disposal at the time. This information concurs with the view that teachers leave their schools in search for other better paying ones. In this case, students suffer because it is not possible to find an immediate teacher to replace the departed ones.

On well-equipped school libraries and laboratories, 4% strongly agreed, 12% agreed, 38% strongly agreed and 46% agreed with the statement in question. Therefore 16% of respondents agreed while 84% disagreed with the item on the study.

Such results lead to the bad performance of students. Teachers can not spare their time visiting school libraries or laboratories knowing that they are poorly equipped and this puts students at risk of acquiring outdated contents which in many occasions affect their performances.

6. DATA ANALYSIS

The objective of this study was to find out the influence of school infrastructures on students' performance in Kayonza district. The study found out that school infrastructures were still inadequate in almost all schools of Kayonza district.

The school infrastructures constitute the school environments in the teaching and learning activities. The 9YBE schools infrastructures are very poor, lacked sustainable, comfortable grounds and sanitary structures. These findings made Kayonza 9YBE schools not facilitate the teaching and learning activities competently as agreed with Nwagwu (1978) who postulated that the quality of education that children receive bears direct relevance to the availability or lack of school infrastructures and overall atmosphere in which learning takes place.

The researcher agrees with Dike (2002), who emphasized that pupils must be taught under good school infrastructures (good classrooms) so that learning can effectively take place. The availability of adequate school infrastructures is expected to provide schools with conducive teaching and learning atmosphere. Basing on tables 9 and 12, most schools are needy in terms of schools infrastructures. A lot is still desired to improve the atmosphere of the learners and their performance.

These findings corroborated Asiabaka (2008) who opined that the transfer of knowledge does not only take place in the four walls of the classroom, from the teacher to the students but rather that learning takes place through discovery, exploration, interaction with the internal and external school environment.

With geographical factors, the researcher observed that many schools existed on tops of hills and getting there was difficult for the teachers and students. This demoralized teachers and students due to inaccessibility to and from the school. The lack of basic infrastructures in the area such as access to roads, electricity and developed trade centres were the main factors that led to the students' poor performances. Students could not find where to revise their lessons from during night preparations and this affected their performances in exams. This study observed that lack of basic school infrastructures was the major factor that led to the failure or poor performance not only in internal examinations but also in national examinations in 9 YBE kayonza district schools.

7. CONCLUSIONS

The study concluded that inadequate or lack of basic infrastructures like roads, electricity, water, buildings, classrooms, desks, toilets, offices, laboratories, libraries and trading centers handicapped the performance of the 9YBE students in Kayonza district schools.

8. RECOMMENDATIONS

The study recommended that more libraries and laboratory materials, sufficient science and technical equipments materials, adequate supply of high quality teaching and learning materials, access to safe water and electricity, were required in improving the students' and teachers' performance in all schools.

The study recommended that all policymakers need to be aware of the tradeoffs between introducing free basic education, one grade at a time (stepped implementation) and adopting a big bang approach. It was observed that stepped implementation is slower than simultaneous approach, but it gives policy makers time to plan, budget, build schools, obtain materials and hire the competent teachers. The study recommended for a better assessment of education policies on teaching and learning materials in order to provide better performance of students and teachers.

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