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Factors Leading To Poor Performance Amongst Pupils Learning Science In Selected Secondary Schools: A Case Study In Shiwang'andu District Muchinga Province Zambia.

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Abstract- This study investigated the perceived factors leading to poor performance amongst pupils learning Science in Zambia, a case of Matumbo day Secondary school, Ilondola day Secondary School and Kalalantekwe day Secondary School in Shiwang'andu District of Muching Province. The study used a descriptive research design whereby a total of 45 pupils from the three Schools were selected. These were pupils from Grade 10,11 and 12 Classes. Nine Teachers from the three Schools and three parents from each community surrounding the schools were also selected. Non probability sampling method which was purposive sampling was used to select participants for the study. Data collection was achieved through the use of semi – structured interviews with parents, focus group discussions with pupils and key informant interviews with Teachers. The main findings of this study showed that the common reasons that contribute to poor performance are negative attitude towards Science among pupils and lack of resources such as text books and well equipped laboratories, admission of weak students to grade Eight entry, inadequate Teaching and Learning Materials. It is recommended that the government must ensure that the schools are well-equipped with necessary materials. The Teachers should use modern methods of Teaching Science in order to motivate the students and sustain their interest in the subject.

Keywords- Science, Poor Performance, Factors, Environment.

I. Introduction

Background to the study

The most common problem linked to Learner's poor performance in science in most developed countries are mainly shortage of qualified science educators. Studies have associated shortage of qualified educators with lack of thorough preparation for lessons and reduced coverage of content. In contrast most developing countries including Zambia, have a lot of factors ranging from lack of adequate science resources and facilities such as apparatus and Laboratory respectively, shortage of trained and qualified science educators, large science classes, limited proficiency in medium of instruction and outdated Teaching methods are the central findings. In Zambia, the mounting toll of failure in science persists to be an eyesore and a major concern at Grade Twelve level especially in rural public high schools. It worries to note that underachievement in science in these schools is skyrocketing in an area when the ability to apply science is mushrooming and spreading out at an exponential rate to the daily lives and worldwide events.

statement of the Problem

It has been observed that underachievement in Science in Secondary schools appears to be a major global challenge. Countries around the world have noted that it is imperative to address this challenge for sustainable development because each country's wealth and economic development directly correlates with the capacity of its scientific work force. The situation appears pathetic in the least developed countries of the world. It is disturbing to note that the corresponding trends of low achievement in science by secondary school learners have also been reported in Zambia. The most problems linked to learner's poor performance in science in developing countries including Zambia are mainly shortage of qualified science teachers, absence of basic

science infrastructure and learning – teaching materials to support appropriate science education. It is against this background that this study set out to explore perceived factors leading to poor performance amongst pupils learning science in selected secondary schools of Shiwang'andu District, Zambia.

Research objectives

- To explore the availability of teaching and learning materials of science in secondary schools of Shiwang'andu District.
- To assess the teaching and learning environment of science eductation in selelcted secondary schools of Shiwang'andu District.
- To establish the difficulties pupils face in learning science education in selected secondary schools of Shiwang'andu District.

Significance of the study

This study is important in many ways; firstly, it would generate new knowledge and contribute to the body of knowledge in science education. Secondly, this study will generate information which could be used by various stake holders such as the Ministry of General education, Non-Governmental organizations, families as well as the Ministry of Education by providing empirical findings for decision making regarding improvement in science education.

II. Literature Review

A study conducted by Yusuf, (2007). was aimed at investigating factors that contributed to poor performance in science subjects among students in secondary schools in Busia County, Kenya. The findings of the study showed that factors which affected science performance were negative attitudes towards science subjects, unfavorable home environment and family background. Inadequate resources such as text books, physical infrastructure and laboratories made learners lose interest in the subject hence poor performance. Additionally, Schools that have inadequate infrastructural and human resources performed poorly. For the case of this study, May I define learning environment at the physical location, teaching delivery as well as approached to learning, in contrast to infrastructure, which may refer to physical things such as classrooms, furniture, laboratory and the library.

A study carried out in Malawi found that performance in science subjects was ascribed to lack of science apparatus, lack of enough and quality text books, (teaching and learning sources) students' perception that science subjects are hard, (Students' attitude towards science subjects) and too little time allocated to the practical lessons (Dzama, 2012).

Nyamba and Kizito (2012) conducted a study to establish if students' preference in science affect their performance. Factor analysis of the instrument revealed that there were several factors for the differential choices. The major findings of the study showed that among many other reasons, poor performance in science subjects at ordinary level secondary schools included: age of learners, sex, ignorance, shortage of learning

materials, gender bias by subject teachers and lack of guidance to students on the future importance of science.

In Zambia, Chileya (2016) did a study on factors causing poor academic performance of pupils in Junior Secondary Leaving Examinations in selected day secondary schools in Mwense district: teacher/pupil ratio, absenteeism, lack of teacher pupil motivation in schools, inadequate internal and external teacher monitoring in schools, abnormal teacher work load, non-parental involvement in the learning process of their children, late reporting for lessons by both teachers and pupils, schools and communities working in isolation, inadequate syllabi coverage, inadequate qualified human resource, insufficient teaching and learning materials in selected day secondary schools.

Caillods et al, (1997) found that it was quite common in many African countries that head teachers did not have a science background. The role of many principals was found to be more of administrative, with little direct involvement and concern for classroom activity, thus making decisions for science just like all the other subjects. There are different assumptions about lack of support from parents, especially in the rural schools some of the reasons are that parents lack confidence in being actively involved in their children's education, since they themselves did not receive proper formal education. Some parents are unable to participate in their children's education is because of migrant labor system by which fathers and perhaps mothers too move away from their homes in order to find work, Daniel and Zulu (1996) add that, this has affected family setups of many rural house.

III. Reaearch Methodology

Research Design

Orodho, (2003) defines a research design as the scheme, outline or plan that used to generate answers to the research problems. This research adopted a descriptive research design involving the use of interviews as the data collection tool. White (2005) explains that a qualitative approach is a type of inquiry in which a researcher carries out research in people's experience in natural settings using techniques like interviews. This design helped to study the perceived factors that contribute to the poor performance of pupils in science education in Shiwang'andu district of Muchinga Province in Zambia.

Sample Size

The total number of pupils who participated in the study were 45, 20 male and 25 females. These were grade 10 and 12 pupils and their age ranged from 17 to 20 years. The study had sampled a total number of 9 teachers, 8 male and 1 female. 5 of the Teachers were diploma holders and 4 were degree holders in science teaching. The total number of parents who participated in the study were 9 comprising 4 male and 5 female and their ages ranged from 35 to 55 years.

Data Collection

Semi – Structured interviews

Semi – structured interviews were part of the data collection technique. By definition, it entails a face to face encounter between the researcher and the participants aimed at gaining a meaningful understanding of a perspective on experiences, or situations as expressed in their own words. A set of questions is carried by the researcher. Ospina (2004) noted that, "at the root of in – depth interview is an interest in understanding the lived experience of other people and the meaning they make of it. This technique was used to collect data from 9 parents who were purposively selected.

Focused Group Discussion

A focused group is a group of carefully selected participants who contribute to open discussions for research. Focused group discussion is frequently used as a qualitative approach to gain an in – depth understanding of social issues. The method aims to obtain data from s purposely selected group of individuals rather than from a statistically representative sample of a broader population. In this study, three (3) focus Group discussion were constituted, one from each selected school comprising of 15 participants (Pupils)from each school, the composition was 5 pupils were taken from a grade 10 class, 5 from a grade 11 class and other 5 from grade 12 class.

Data Analysis

Data analysis is a process of evaluating data using analytical and logical reasoning to examine each component of data provided. It involves the process of gathering, reviewing and then analyzing data from various sources to form some sort of finding or conclusion. Qualitative data was analysed thematically. This entailed that the recorded interviews and field notes were the main data sources. And that they were organized according to the types of responses. The interviews and data from participants were transcribed as accurately as possible by listening to the recorded interviews and discussions again and comparing them with the transcriptions. Data analysis involved an ongoing process of continual reflection about the data as well as asking analytical questions.

IV. Presentation Of The Findings

Availability of Teaching and Learning Materials

From the Teachers point of view on this matter, most of them agreed with the majority of pupils that said the school did not have enough needed science textbooks, while others said the school had some but not all needed textbooks. Most community members' point of view was that the selected Secondary schools in Shiwang'andu District did not have the needed materials to meet the standard of learning science education and only few were not sure about the situation because they had never visited the said schools.

Equipped Science Education Laboratory Availability

The results indicated that the majority of the pupils from the three selected schools said that their schools did not have equipped Chemistry and physics laboratories and only few participants said the had equipped science laboratories. The Teachers also said the laboratories lacked what to use during experiments such as chemicals, condenser, separating funnel and many others.

Learning Environment Conducive for Effective Teaching and Learning of Science Education in Secondary Schools.

A few participants had a conducive learning environment for science education while the majority indicated that they did not have a conducive environment for learning science education. This coincides with the Social Cognitive learning theory, which asserts that classroom learning is essentially shaped by factors within the academic environment. It was observed that the majority of pupils stated that the environment was not conducive for learning as far as Science was concerned. As indicated earlier, the schools qualified teachers, laboratories and equipment to make the learning environment conducive.

Teachers Perception of the Effect of Lack of these School facilities and Academic Performance.

On the teacher's response regarding the effect of lack of facilities on students' performance, all the teachers agreed that lack of laboratories, libraries, co – curricular activities like Junior Engineers Technicians Scientists (JETS) fairs and classrooms affected the students' performance, while 8 strongly agreed that lack of textbooks affected pupils' performance and 9 strongly agreed that lack of classroom activities also affected performance.

Motivated by Science Teachers.

The majority participants said that they were motivated by their Chemistry and Physics teachers while 5 said they were not motivated by their science education teachers. All the Teachers from the three selected schools alluded to the fact that they did not motivate their pupils. It was also inquired from the participants on how they were motivated by their science teachers. Most of the participants said their science teachers encouraged them to study hard in science because most of the good careers in the world were science oriented.

Guardians Helping Pupils in Understanding the Importance of Science Education

The majority of the participants allude to the fact that the people they lived with did not help them in understanding the importance of learning while a few participants pointed to the fact that the people they stayed with did help them in understanding the importance of learning science education.

Difficulties in Learning Science Education

A good number of participants pointed out that the school did not have apparatus to use for experiments. The majority of participants also said there was a shortage of science teachers in the schools while on the other hand, the majority of the pupils had difficulties in understanding science concepts and a good number of participants stressed that there was lack of science textbooks.

V. Discussion Of Findings

In this study, it was revealed that poor performance in science among secondary school pupils in Shiwang'andu District was due to various factors among them negative attitude towards the subject, lack of exposure of both teachers and pupils, lack of necessary material required during the process of teaching and learning sciences, Lack of laboratory and laboratory equipment and well-trained laboratory technicians or teachers. Science students were not well equipped with the relevant knowledge they required to pass their examinations and even to practice science related activities after graduating.

Availability of Necessary Teaching and Learning Materials of Science in Shiwang'andu District

On the availability of teaching and learning materials in secondary schools in Shiwang'andu District as the objective number one, it was shown that all the three secondary schools in Shiwang'andu district had inadequate learning and teaching materials.

It was also inquired from the communities to find out if they were involved in helping the selected schools in the study so as to have the needed materials, most of them said they were not involved at all, only one community member said he was involved through being a parent Teachers Committee Chairman. All the parents stressed that the factors that contributed to poor performance in science were inadequate learning facilities in secondary schools which included science equipment and laboratories, shortage of qualified and devoted instructors and lack of ability by the scholars to do well in science practical.

To Assess Teaching and Learning Environment for Science Education in Secondary Schools.

The study brought about, in general, that the learning environment in Public secondary schools was poor. There was only one secondary school that had a library and even this one had inadequate study materials. It was also leant that most of the classrooms in all the schools were overcrowded with nearly all learners sharing desks (Three or four Learners sharing a desk in some cases) in classrooms while accepting that infrastructure was just one determinant factor, it would not be far – fetched to conclude that infrastructure had been a key factor in the below average performance in science by Shiwang'andu Pupils in promotion test and National examinations over the years.

Difficulties Faced by Pupils in Learning Science

Community members perceived challenges faced in learning science such as lack of enough Classroom space, insufficient teachers of science, long distance to schools as all the three secondary schools were day schools, proximity to social amenities like bars that usually played loud music during lesson times and some pupils engaged in beer drinking, pupils had a tendency of opting to miss lessons and go to caterpillar collection and mining, lack of libraries and lack of internet facilities for research.

VI. Conclusion

Non-availability of teaching and learning materials generally affected the performance of students. These materials should be made available and they should be of good quality in order for them to produce accurate results during practical sessions. The other schools had no equipment at all and opted for alternatives to practical which was not applicable since these students required that knowledge for their future careers. The

teaching and learning environment in some of the secondary schools was found to be unfit for science lessons. One school had no single laboratory and the practical lessons were done in the classrooms. Therefore, parents, the Government and the society at large should ensure that the environment is conducive for learning to take place effectively. The findings of this study indicated that one of the major difficulties that the teachers faced while teaching science was the student's negative attitude towards the subject. They had the perception that Science was always very tough compared to other subjects which discouraged them, hence, affected their performance.

Recommendations

Based on the findings of the study, the following recommendations were made;

There is need for parents or Guardians in the area to organize themselves and encourage their school going children to concentrate in studying science by setting some time to study the subject.

The school and the community should work together in ensuring that pupils concentrate on their education and take full responsibility of their education and discourage them from involving themselves in outside school activities like Caterpillar collection and mining. School managers should also fence their schools in order to monitor movements of pupils.

Guidance teachers should provide motivational talks on the importance of learning science by educating the pupils on the career prospect anchored on science education.

There is need for school management, science teachers, parents and teachers' committees to introduce education tours so that teachers and pupils from this district can interact with people in the industries such as the mining plants and Hydro Power plants where the science knowledge and skills are applied for the pupils to get motivated and appreciate the applicability of the science education in real life.

Government and other stake holders should construct science laboratories and stock them with the required equipment. There is also need to build computer laboratories with proper internet so that both pupils and teachers can utilize them for research.

The Ministry of Education (MOGE) should employ more qualified science teachers as well as procure updated chemistry and physics text books for schools in Shiwang'andu District.

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