FACTORS THAT CONTRIBUTE TOWARDS POOR PERFORMANCE OF STUDENTS IN SCIENCE IN RURAL SCHOOLS IN TSHOLOTSHO DISTRICT IN MATABELELAND PROVINCE IN ZIMBABWE

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ABSTRACT

This study sort to investigate learners' attributions on high failure in science examinations in rural secondary schools in Tsholotsho district in Matabeleland North Province of Zimbabwe which has a student population of 2300 at Ordinary Level. A total of 400 respondents were used of which 240 were girls and 160 were boys. The research instrument used was the questionnaire which had both close ended and open ended questions. Descriptive statistical analysis was used to interpret data. The study revealed that pupils attributed their failure mainly to lack of material resources, poor teaching methods, bad teacher behaviour, and poor grounding in the subject at lower levels as well as their fear of the subject. The study recommends that the Ministry of Education should embark on serious in service training science teachers. Teachers should also embark on team teaching to assist each other on the subject. Finally, pupils should be motivated to view science like the rest of the subjects in the school curriculum.

Key words: Poor performance, science, learners, rural secondary, Ordinary Level

Introduction

Education is considered as a tool to be used for the integration of individual into society to achieve self-realisation, develop national consciousness, promote unity, and strive for social economic, political, scientific, cultural and technological progress (Afe, 2012). According to Umamer (2011) education in science is bedrock and an indispensable tool for scientific technological and economic advancement of any nation. In spite of the significance role that it plays, most pupils find it difficult to pass this subject. Science has been viewed as the most difficult subject in the secondary school particularly by children in the rural areas (Vundla 2012) Science is a fundamental part of human thought and logic, and integral to attempts at understanding the world and ourselves (Lynn and Brocado 2009). Science provides an effective way of building mental discipline and encourages logical reasoning and mental rigour (Skemp 2008). In addition, as Schoenfield (2012) observes science knowledge plays a crucial role in

understanding the contents of other school subjects such as geography, social studies, technical drawing and even music and art. On the other hand Mthethwa (2011) views science as a branch of study that deals with logic, decisions-making, deductions, assumptions, precision, clarity of thought and the ability to solve problems in a calculative manner by following a series of steps. This is an important subject not only from the point of view of getting an academic qualification at school or college, but also is a subject that prepares the students for the future as well, irrespective of which walk of life they choose to be a part of (Davis and Hersh, 2012). Yet in spite of the important role the subject plays both at school and in life in general, most students perform badly in Zimbabwe's secondary schools in this subject. There is a general dislike of the subject by students as a result of this situation. It is on account of this information that this study sets out to explore that student's attribute to be the causes of their poor performance in science.

Statement of the problem

The study sought to investigate the major causes of poor performance in science by rural secondary school pupils. In spite of the significant role played by science both in enhancing comprehension of other school subjects and its general role in life learners continue to fail the subject at various levels in the school system, particularly at Ordinary Level public examinations. There is, therefore need to investigate the factors that contribute towards this high failure rate.

Purpose study

The study sought to investigate the major causes of high failure rate in rural secondary schools in science at Ordinary Level. The sought also sought to come up with comprehensive list of strategies that could be used to combat this failure rate

Research Questions

1. How do teacher factors contribute towards the failure of students in science.
2. Does the students' attitude and commitment towards mathematics constitute a significant problem in the performance of student in science at public examinations.
3. Does the lack of instructional materials, educational facilities constitute a significant factor in students' poor performance in science public examinations.
4. Do supervisors in schools provide adequate instructional supervision in science.

Significance of the study

The importance of this study stems **form** the fact that if **causes** of student poor performance in science are illuminated, solutions to mitigate these causes will be proffered. The study also envisages to sensitive major stakeholders in the school system about the need to improve teaching and learning conditions for science.

Limitations of the study

In view of the small size of the sample and sub-samples used, the findings of this study therefore will have limited generalisability.

Delimitations of the study

The researchers delimited the investigations of establishing the causes of poor performance of Ordinary level pupils in science in rural secondary schools in Tsholotsho District in Western Zimbabwe. Views from 400 Ordinary Level pupils were used in this research. Perceptions from the other stakeholders, like teachers, parents, heads of schools and other key stakeholders were outside the purview of this study.

Literature review

Science is studied for a variety of reasons. According to Paisey (2010) science is a passage to understanding many other subjects. In a broad sense, it forms the basis of many of the sciences, such as physics and astronomy (Lyons, 2008). Science also allows advancement in technology. Things ranging from the hydrogen bomb to compact discs would not have possible to build without knowledge of science (Smit, 2010) as Polya (2011) argues also helps us in everyday life. For example, it helps us (Skemp, 2008). Because science is such a big part of our lives, society deems it a worthy subject to study. Consequently, children all over the world are required to learn the subject (Polya, 2008). Science teaches children important problem solving skills that they can apply to other aspects of their lives (Umameh,2011). It helps them to think in a logical manner, and also helps them view and analyse things in a more sophisticated way.

According to Samuelson (2011). To know science means that a student has learned and mastered the skills needed to find a solution to a particular problem. Often these skills take a long time to perfect (Avital, 2010).

In addition the ability to make learning fun and worthwhile is also crucial. If the teacher can make the students want to learn science at a younger age, Science will be less intimidating and more enjoyable for them as they continue to study it in latter grades or forms (Turner and Betts,2012). It is a challenge to help students overcome their frustrations, but at the same time it is necessary effort because of the important role science plays in the world (Gatawa,2008).

Despite the significance of science both at school and in life in general that were highlighted above, learners continue to fail the subject (Lyons,2008). Skemp(2008) revealsthat the failure rate in science in Zimbabwe schools is unacceptably high. Similarly, Bush (2009) cites several studies pointing to high failure rate in science in Zimbabwe. While Zimbabwean learners are generally not performing well in science the situation is even worse among rural secondary school learners (Afe, 2012).

Literature has a plethora of reasons for high failure rates in science. For example, Vundla (2012) states that shortage of well-trained teachers, inadequacy of teaching facilities, lack of funds to purchase necessary equipment, poor quality textbooks, large classes, poorly motivated teachers, lack of laboratories and libraries, poorly coordinated supervisory activities, interference of the school system by the civil service, incessant transfers of teachers and principals/heads, automatic promotion of pupils, the negative role of public examination on the teaching and learning process and inequality in education opportunities all hamper the smooth acquisition of science knowledge.

One of the most important factors for improving performance is students' involvement (Polya 2011). By involvement, it means how much time, energy and effort students devote to the learning process (Mthethwa,2011). There is a good deal of research evidence to suggest that the more time and efforts students invest in learning process and the more intensely they engage in their own education, the greater will be their growth achievement and their satisfaction with their educational experiences and their persistence in school, and the more likely they are to continue their learning (Umameh,2011).

Students are unlikely to learn unless they are somehow involved in the process of learning; they seldom learn much when they are treated simply as passive receptors. (Obodo, 2012). For Bush (2009) students bring to the instructional setting their abilities, motivational propensities, personal background; home background, community values and these can mar or make or supersede teachers' intervation of whatever ability. Osafelintic (2009) posits that if a student has a positive attitude towards science, he/she will not only enjoy studying it but will also derive satisfaction from the knowledge of science ideas he/she gains.Obodo (2012) explains further that if a student has a positive attribute towards science, he/she will definitely be interested in its teaching and learning. For Salmon (2010), most science teachers do not make the teaching of science practical and exiting and this leads to negative attitudes to science by students. Sidhu (2006), state that the elements of novelty, usefulness and sheer intellectual curiosity are primary stimuli, for awakening and maintaining the students' interest in science.

According to Umameh (2011) with genuine attitudinal change, sustained interest and continual challenge, science would no longer seem to the student a boring useless to real life issues and increasingly incomprehensible but a subject that will be longed for. Samuelson (2011) in a study of students' perceptions of science in rural secondary schools in South Africa found that student thought that teachers who did not have competence in teaching science were unlikely to be aware of the way to assist learners in solving problems in science. Students also mentioned that some of the teachers did not understand all the chapters in science textbooks, and so it was difficult for them to assist students on those topic they did not understand (Avital, 2012). Students also revealed that some of their teachers were always absent from school and when they returned they had to cover previous week's topics resulting in failure to go through the syllabus. Nyarumwe et al (2004) reporting about Zimbabwe, found that some of the methods teachers used to teach science did not help students develop conceptual understanding of science, hence the high failure rate in the subject in Zimbabwe.

Method

The study employed the quantitative methodology. Quantitative research was chosen for ability to enable this study's findings to be generalized to other districts (Anderson, 2011). The quantitative methodology was also found useful in this study because it enabled the researchers to gather widespread perceptions of the respondents on the studied phenomenon (Bell, 2013). The study's population comprised 2300 pupils. The study employed a simple random sampling technique to select the respondents because it permitted every pupil an equal opportunity of participating in the study (Kumar, 2008). The researcher used a questionnaire with a mixed bag of close-ended questions and two open-ended questions to collect data from respondents. Close-ended questions enabled the researchers to collect pre-determined respondents' opinion regarding the studied phenomena (Kumar, 2008).

Data Collections and Analysis

Data were gathered by means of a questionnaire which was largely made up of close-ended questions. The questionnaire was chosen because as Cohen and Manion (2011) observe, has the ability to reach many respondents who live at widely dispersed addresses and preserves anonymity which encourages greater honesty. However, as Anderson (2012) argues, the questionnaire generally has low response rate and is inflexible in that it does not allow ideas or comments to be explored in-depth and many questions may remain unanswered. The researchers distributed the questionnaire to the various schools and collected it after a week through the heads of schools. Data collected from questionnaires yielded descriptive statistics around the variables and inferential implications from them derived and recorded.

Results and discussion

The study set out to explore the causes of poor performance of Ordinary level pupils in science in Zimbabwean schools. This section is presented in two parts; namely presentation of data.

As table 1 reveals, 60% of the respondents were female and 40% were male. The datum was considered statistically significant to the extent that it confirmed the wide-held hypothesis that more pupils in Zimbabwean schools are girls.

Table 1: Composition of sample by gender (N=400)

Sex	Frequency	Percentage
Male	160	40
Female	240	60
Total	400	100

Table 2: Responses to the question "Science is naturally a very difficult subject"(N=200)

Category of respondents	Frequency	Percentage
Strongly agreed	240	60
Agree	52	13
Disagree	60	15
Strongly disagree	48	12
Not sure	0	0
Total	400	100

Table 2 above shows that an overwhelming majority of respondents (73%) believe that science is naturally a difficult subject. Those who disagreed with the statement constituted a paltry 27% of the respondents.

Figure 1: Responses to the question: "Learners' absence from school affects their performance in science (N=400)

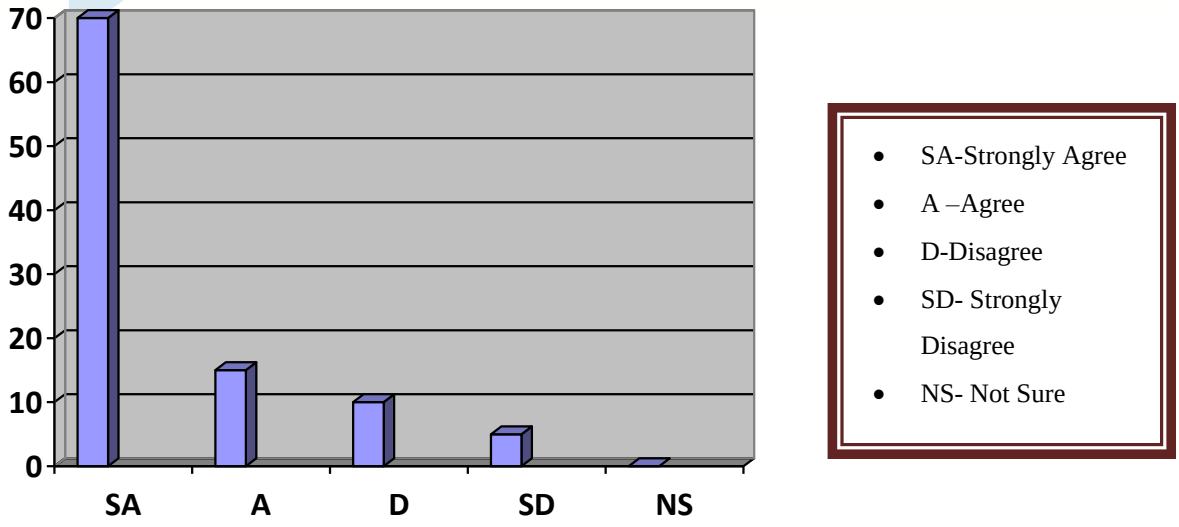
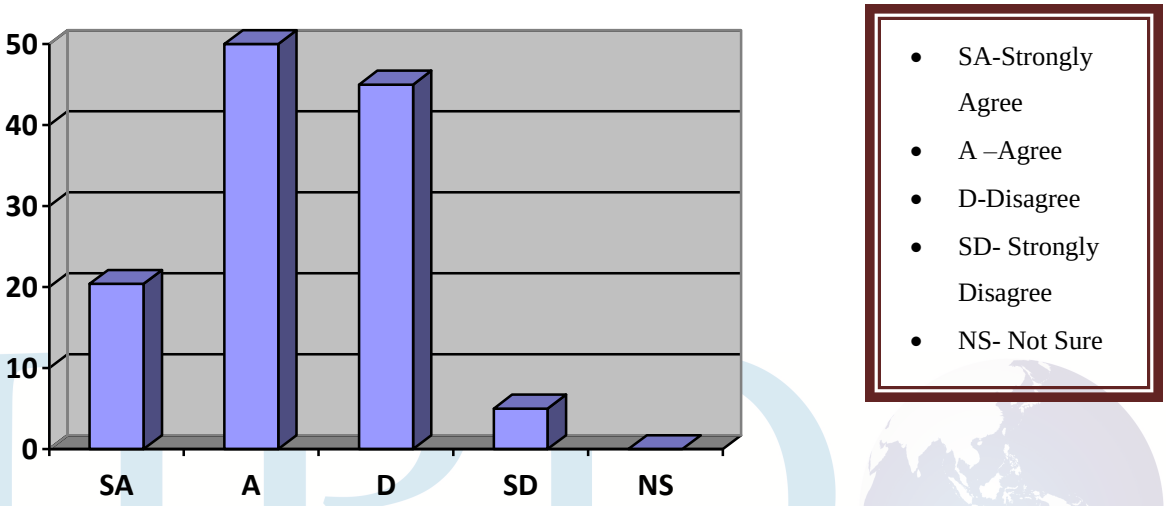


Figure 1: above shows that the majority of respondents (85%) agreed that most learners were always absent from school. Those who disagreed were 15% of the respondents. None was unsure about the statement.

Figure 2: Responses to the question: "Teachers use learning methods that learners do not easily follow when teaching Science" (N=400)



As information on figure 2 reveals, 85% of the respond agreed with the assertion that teachers used learning methods that learners did not easily follow when teaching science. Those who disagreed with the statement constituted 14% of the respondents and only 1% were not susre about assertion.

Table 3: Responses to the questions: "Learners fail science because the classroom environment is not always stimulating" (N=400)

Category of respondents	**Frequency**	**Percentage**
Strongly agreed	200	50
Agree	100	25
Disagree	44	11
Strongly disagree	40	10
Not sure	16	4
Total	400	100

Table 3 above shows that the majority of the respondents (75%) indicated that their classroom environment was not always stimulating for them to enjoy the teaching and learning of science. Those who indicated that it was conducive constituted 21% of the sample. Only 4% of the samples were not sure about the question.

The information above reveals that 57% of the respondents believed that their teachers were not competent enough to teach science. Those who disagreed with this assertion constituted 33% and 10% indicated that they were not sure whether their teachers were competent enough to teach science.

Table 4: Responses to the question: "Teachers are not competent to teach science" (N=400)

Category of respondents	Frequency	Percentage
Strongly agreed	136	34
Agree	92	23
Disagree	84	21
Strongly disagree	48	12
Not sure	40	10
Total	400	100

Table 5: Responses to the question: "Teachers are always absent from work therefore, leaving pupils always behind in science concepts" (N=400)

Category of respondents	Frequency	Percentage
Strongly agreed	220	55
Agree	104	26
Disagree	28	7
Strongly disagree	20	5
Not sure	28	7
Total	400	100

Table 5 above reveals that the majority of respondents (81%) agreed with the statement that their teachers were always absent from work thereby disadvantaging them. Those who disagree were 12% of the respondents and 7% were not sure about what to say regarding this question.

The questionnaire had two open ended questions which bolstered data from the close-ended questions. The first question sought to find out from respondents whether their parents or guardians assisted them with homework after school or during weekends. The majority of respondents indicated that it was very difficult to do their homework because their parents or

guardians did not provide them with assistance in the form of lights, textbooks and direct assistance on the science concepts. Some even indicated that they were not given free time to do their homework due to the various chores they had to do.

The second question sought to find out how many of the respondents would opt of doing science if it was not a compulsory requirement for employment purposes. Most of them indicated that they would not do the subject. It was found that the majority of the respondents had once dropped the subject one time or the other due to its difficult nature.

Discussion

The information from this study revealed that the majority of learners believe that science is naturally a very difficult subject. This means that they have a fear for the subject. An attitude like this one does not help the learners in the quest to acquire knowledge on this subject. As Osafehinti (2009) posits, if a student has a positive attitude towards science he/she will not only enjoy studying it but will also derive satisfaction from the knowledge of science ideas he/she gains. Findings also reveal the respondents believed that the absence of learners from school affected their performance in science. Attendance on a sustained basis is very important if learners are to acquire the necessary skills in science. As Umameh (2011) argues, there is a good deals research evidence to suggest that the more time and efforts learners invest in the learning process and the more intensely they engage in their own education, the greater will be their growth and achievement. The study also revealed that teachers used learning methods that learners did not easily follow when teaching science. This result tallies with observations by Soer (2009) who states that the teacher needs to communicate this knowledge in a clear and informative manner. Teachers need complicate one's delivery of lessons in science by using language that is beyond the scope of the learners. This will succeed in frustrating the learners rather than making them enjoy learning the subject. Results from this study also revealed that respondents felt that their classroom environment was not always stimulating for them to enjoy the teaching and learning of science. As Salman (2010) observes, most science teachers do not make the teaching of science practical and exciting and this leads to negative attitudes to science by students. Pupils, as the researcher see it; need to be actively engaged in the learning of science rather than being listeners and observers of the teaching of the subject. The study also revealed that the majority of the respondents indicated that their teachers were not competent enough to teach science. This observation tallies with findings fro Nyaumwe et al (2004) who found that some of the methods teachers used to teach science did not help students develop conceptual understanding of science. Teachers need to be true guides and facilitators of the learning of science by learners. The information also revealed that teachers were said to be always absent from work therefore leaving pupils always behind in science concepts. As Samuelson (2011) found out teachers who did not have competency in teaching science was unlikely to be aware of the way to assist the learners more so if they also absented themselves. When they returned they had to cover previous weeks' topics resulting in failure to cover syllabus. The findings also

revealed that most of the respondents did not get support from their parents and guardians when they were doing homework. This tallies with Bush's (2009) observation that home background and community values can mar or make effective learning. Evidence from the study also shows that the majority of learners have negative attitudes towards science. According to Umameh (2011) there is need for genuine attitudinal change as it may bring about interest and positive attitudes towards the subject.

Conclusion

Give the background of the above findings, the researchers make the following conclusions:-

- Learners strongly believe that science is a naturally difficulty subject that should be avoided at all costs.
- Absenteeism by both learners and teachers from school adversely affects the acquisition of concepts in science.
- Evidence from the study also reveals that teachers used learning methods that did not simplify science concepts for the learners.
- Classroom environment were not always stimulating for learners to enjoy learning science
- Most teachers teaching science were not competent to teach the subject effectively.
- Learners did not receive maximum support when doing science homework from relatives at home since they (relatives) lacked the competence to help the learners.

Recommendations

Based on the study's results and conclusions, the researchers put forth the underlying recommendations.

- There is need to improve the quality of science teachers' uses of university graduates who speacilised in science should be encouraged and these currently teaching the subject should be in serviced regularly.
- Schools should not tolerate absenteeism by both learners and teachers as it affects the learning process.

  Punitive measures should be put in place to curb the bad habit.
- The physical environment of the schools should be improved. There should be adequate furniture, relevant textbooks and computers for use during science lessons.
- Schools should invite parents or guardians to encourage them to provide support and assistance to their children's they do homework.
- There should be guidance and counseling sessions where the importance of doing science is shared with pupils so that they may develop positive attitudes the subject.

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