

SCHOOL- BASED FACTORS AFFECTING GRADE 12 LEARNERS' ACADEMIC PERFORMANCE IN NAMIBIA SENIOR SECONDARY CERTIFICATE ORDINARY LEVEL BIOLOGY IN THE KHOMAS EDUCATIONAL REGION, NAMIBIA

N. K. Muyoyeta¹, J. Abah and ²D. Denuga²

¹Department of Mathematics, Science and Sports, Faculty of Education, University of Namibia Private Bag, 13301, Windhoek, Namibia

²Department of Mathematics, Science and Sport Education, Faculty of Education, University of Namibia, Katima Mulilo Campus, Private Bag, 1096, Katima Mulilo Namibia

ABSTRACT: *This study investigated school-based factors affecting Grade 12 learners' academic performance in the Namibia Senior Secondary Certificate Ordinary level (NSSCO) Biology and how the Biology teachers manage the factors in the Khomas Educational Region. Mixed methods research design involving both quantitative and qualitative approaches were used to collect data. A sample of 450 NSSCO Biology learners, 15 Biology teachers and 15 science Heads of Department (HODs) were randomly selected to fill questionnaires. Furthermore, a sub-sample of 2 science HODs and 2 Biology teachers who have taught Biology for at least three consecutive years were purposively selected to participate in the interviews. The study found that lack of relevant teaching and learning resources, lack of laboratory equipment, lengthy NSSCO Biology syllabus, overcrowded classrooms, and school management's lack of commitment constitute the school-based factors affecting Grade 12 learners' academic performance in NSSCO Biology in the study area. The Biology teachers managed these factors through: networking with professional colleagues within the same school clusters, organizing after school classes, and improvising on available teaching materials. It is however, recommended that: the schools management seek support from government, donor agencies and philanthropic organisations for relevant teaching and learning resources, including laboratory equipment. The management should also step up their supervisory role as it is an important part of quality assurance measures that could support teaching and learning.*

KEYWORDS: School-Based Factors, NSSCO Biology, Learners' Performance, Khomas Region

INTRODUCTION

The importance science is crucial as science and technology is now widely considered as the pillar of any country's development. Aikenhead (1996) noted that science education is imperative for useful living in any society and it is at the centre of producing resources necessary for socio-economic, scientific and technological development needed for advancement of any nation. However, much has been argued about secondary school learners poor performance in science generally and Biology in particular. Various reasons were put forward by different scholars and educationists to explain the causes of learners' poor academic performances. Epri (2016) noted that due to overcrowded classroom, teachers' failure to support learners with special needs as well as the shortages of teaching and learning resources affect the quality of teaching and learning. Furthermore, learners in overcrowded

classrooms do not participate actively because the teachers end up using the teacher-centred approaches such as the lecture method (Dabo, 2015) to teach lessons. Under this condition, learners may not receive the desired attention needed to promote effective learning.

In the science subjects such as Biology which requires a lot of practical works, inadequate teaching and learning resources may lead to passive learning with profound effects on learners' academic performances. Jackson (2009), also indicated that lack of parental involvement, poor school management, and shortage of educational facilities and resources cause poor performance. The importance of teaching material is critical in the teaching of science and Biology in particular. Dinah (2013) noted that availability of textbooks, laboratory apparatus and other learning resources contribute significantly to the performance of learners in Biology examination. In addition, several laboratories are ill-equipped and the Biology syllabus is over loaded (Ajayi, 2012). Studies have found that there is a relationship between the use of learning resources and the performance of learners. Schools with adequate resources perform better than those with inadequate resources (Mudulia, 2012). The use of teaching materials for example improves academic performance in Biology (Akinfe et al., 2012). Lack of enough teaching materials further affects discipline in schools (Nyoroge and Nyabuto, 2014). This is likely because when learners work with few materials, they may be expected to always work in groups which in some cases, give chance to learners to talk issues unrelated to the work at hand.

Organisations such as schools need sound leadership in order to function. Poor school leadership have effects on learners' performance (Stephanus, 2008). Poor school leadership could lead to complete breakdown of discipline on the part of both teachers and learners with negative effect on the qualities of teaching and learning. In addition to providing adequate learning infrastructures, there should be sound leadership structures to ensure commitment to achieving optimum learning goals. Robinson et al. (2008) reported that leaders should ensure an orderly and supportive environment where teachers focus on teaching and the learners on learning. Schools should have a leadership that is willing to listen to learners, teachers and all its clients because a school leadership that does not respond to its people can affect school discipline (Nyoroge and Nyabuto, 2014) and performance. The task of leaders and managers is to raise the levels of achievement of learners (Dean, 2002).

Learners who wish to pursue careers in science need to perform well in science subjects such as Biology, Physical Science and also Mathematics. Painfully, the Namibia Senior Secondary Certificate Ordinary level (NSSCO) Biology has been one of the subjects where learners continue to perform poorly with less than 30% of learners graded in the priority symbols A⁺-D in the whole Namibia (Education Management Information System (EMIS), 2012). Between 2010-2015, the NSSCO Biology examination statistics for the Khomas educational region shows that the following percentages of learners were graded in A⁺ -D symbols: 30.58% in 2010; 29.75% in 2011; 25.46% in 2012 and 25.62% in 2013, 25.31% IN 2014, 27.98% IN 2015 (DNEA, 2015; 2014; 2013; 2012; 2011; 2010). The trend of this statistics reveals a decline in the learners' performance in the NSSCO Biology which could be attributed to several factors. Ajayi (2012), has found that both the learners, teachers and the school can affect learners' academic performance. Thus, there is need for relevant researches on the learners' poor performance in the NSSCO Biology with a view to identifying the associated factors and recommend strategies that could be applied to improve the Grade 12 learners' performance in the subject in the Khomas Educational Region. It is for this reason that this study was conducted as a part of master thesis to determine the school-based factors

that affect Grade 12 learners' academic performance in NSSCO Biology in the Khomas Educational Region.

THEORETICAL FRAMEWORK

This study is based on the propositions of the Conditions-Based Theory which state that: 1). The acquisition of different learning outcome category requires different internal conditions; 2). Different internal processes are supported by identifiably different instructional support (Ragan et al., n.d). These propositions relate to the current study because the poor performances of Grade 12 learners in NSSCO Biology in the Khomas Educational Region may be influenced by internal conditions such as working environment, availability of resources, and motivations among others. Hence, identifying the specific factors and different possible supports through research evidences are critical in order to design appropriate strategies that could improve the learners' academic performance. When the schools' working environment are appropriate and both the NSSCO Biology teachers and learners are well motivated, these will reflect in learners' academic performances, both in tests and examinations and this is supported by the fourth proposition which states that different internal processes are supported by identifiable different instructional support.

METHODOLOGY

This study used a mixed methods research design involving both quantitative and qualitative research. The quantitative research method was a survey design which used questionnaires to collect data on the perceived school-based factors affecting learners' academic performance. A simple random sampling technique using the lottery method was utilized to select the samples of 450 NSSCO Biology learners, 15 Biology teachers and 15 science Heads of Department (HODs) to fill questionnaires. Both the NSSCO learners, Biology teachers and science HODs were sampled to complete the questionnaires so that the researchers could gather wide opinions on the school-based factors affecting Grade 12 learners' academic performance in NSSCO Biology in the study area.

The qualitative research method utilized interview schedules to collect data on how the Biology teachers manage the identified factors in order to improve learners' performance in the NSSCO Biology. A sub-sample of 2 science HODs and 2 Biology teachers who have taught Biology for at least two consecutive years were purposively selected to participate in the interviews.

This study used descriptive statistics to analyse the quantitative data collected. The qualitative data from the interviews were analysed using the content analysis technique in order to identify patterns, ideas and themes that emerge from the data. The researchers read through the data interview transcripts first, code the data using pre-determined themes developed from the research questions and then interpret the data in detailed discussions.

RESULTS AND DISCUSSIONS

Background information of participants

Table 1 shows the different categories of the study participants. There are a total of 480 participants consisting of 256 male and 194 female NSSCO learners, 9 male and 6 female Biology teachers, as well as 11 male and 4 female science HODs respectively.

Table 1: Sample distribution

Sample	Male	Female	Total
NSSCO Learners	256	194	450
Biology Teachers	9	6	15
Science HODs	11	4	15
Total	276	204	480

Table 2: Years of teaching experience

Number of years	Biology Teachers		Science HODs		Total
	Male	Female	Male	Female	
0 -2	2	1	2	1	6
3 and more	7	5	11	3	24
Total	9	6	6	4	30

Table 2 shows that the greater number of both the Biology teachers and Science HODs had 3 and more years of experience in teaching the NSSCO Biology. Thus, the greater numbers of these participants (Biology teachers and science HODs) are presumed to have adequate experience of the factors affecting Grade 12 learners' academic performance in NSSCO Biology in the study area. Apart from acquiring higher academic qualification, this study considers continuous three years of teaching NSSCO Biology as adequate for a teacher's experience on factors affecting learners' academic performance in the subject.

Findings from the questionnaires

Availability of teaching and learning resources

The results in Table 3 show the frequencies of participants' responses on the availability of teaching and learning resources relevant to NSSCO in the study area. The results revealed that more learners (56%) agreed that the school has enough Biology textbooks and 22% learners strongly agreed with the statement. The table also revealed that more learners (46%) disagreed that the schools have sufficient laboratory equipment while 22% strongly disagreed. In response to whether the school have functional science laboratories, 44% of the learners disagreed while 28% agreed with the statement. Further, the table shows that more learners (38%) agreed that the classroom for Biology is overcrowded, 31% disagreed while 10% strongly disagreed with the statement. Additionally, the table revealed that more learners (62%) agreed and 27% learners strongly agreed that the school have qualified teachers.

The table also showed that more teachers (47%) agreed and 27% strongly agreed that the school has enough Biology textbook for each learner while 20% disagreed. More teachers

(53%) disagreed that the school has sufficient laboratory equipment and 27% agreed. Furthermore, 47% of the teachers agreed and 27% strongly agreed that the school has functional science

Table 3: Frequencies of participants' responses on availability of teaching and learning resources

Statement		SD			D			UD			A			SA					
		L	T	H	L	T	H	L	T	H	L	T	H	L	T	H			
The school has enough Biology textbooks for each learner.	Freq	5	1	0	8	3	3	4	9	0	0	2	5	4	7	5	9	4	6
	%	1	7	0	8	0	7	2	0	0	6	7	3	2	7	3	2	7	0
The school has sufficient laboratory equipment.	Freq	9	2	3	2	0	8	8	5	0	0	9	8	4	4	4	4	1	0
	%	2	1	2	4	5	5	1	0	0	2	2	2	2	7	7	9	7	0
The school has a functional science laboratory.	Freq	4	0	0	2	0	0	4	4	1	0	0	2	4	7	4	7	4	7
	%	1	0	0	4	4	7	2	0	0	8	7	7	2	7	7	6	7	7
The classroom for Biology is overcrowded.	Freq	4	2	2	1	4	6	8	1	0	0	1	7	7	5	3	7	0	0
	%	1	1	1	3	4	5	3	5	0	0	3	4	3	3	1	6	0	0
There is lack of Biology references books for learners and teachers.	Freq	4	0	0	8	1	2	2	2	0	0	2	4	1	8	6	0	2	5
	%	1	0	0	8	1	3	3	5	0	0	5	4	3	3	3	3	3	3
The school has a qualified Biology teacher.	Freq	1	0	0	1	4	0	0	2	0	0	2	7	1	8	2	1	2	7
	%	4	0	0	3	0	0	4	0	0	2	7	3	8	5	2	7	3	7

Key: Freq = frequency, SD = strongly disagree, D = disagree, UD = undecided, A = agreed, SA = strongly disagree

laboratories. In addition, more teachers (47%) agreed that the classroom for Biology is overcrowded while 40% disagreed with the same statement. The table also showed that 73% of the teachers agreed that there is lack of references books for learners and teachers, and 13% strongly agreed to the statement while another 13% disagreed.

The findings further revealed that more HODs (40%) strongly agreed that the schools have enough Biology textbooks for each learner and 27% of HODs disagreed with the same

statement. It was also found that more HODs (53%) disagreed that the school has sufficient laboratory equipment while 27% agreed with the same statement. When asked whether the school has a functional science laboratory, majority of HODs (47%) strongly agreed, 27% agreed and another 27% disagreed with the statement. Furthermore, 53% HODs agreed and 47% strongly agreed that schools have qualified Biology teachers.

School support

The result in Table 4 shows the frequencies of participants' responses on the schools' support in the study area. The result showed that 57% of the learners agreed that classrooms are available for the learners to study after school and 22% strongly agreed while 15% disagreed. More learners (60%) agreed and 40% strongly agreed that learners are called for counselling for not performing as expected while 24% disagreed with the statement. The table also revealed that more learners (37%) disagreed with the statement that the schools offer remedial classes for learners who are underperforming but 23% agreed with the statement. Furthermore, the table showed that more learners (47%) strongly agreed that the schools reward learners who perform well academically, 33% agreed while 12% disagreed with the same statement.

Table 4 also showed that more teachers (60%) agreed that classrooms are available for learners to study after school while 20% teachers strongly agreed and 20% disagree disagreed. The table also showed that more teachers (73%) agreed that the schools offer remedial classes for learners

Table 4: Frequencies of participants' responses on schools' support

Statement		SD			D			UD			A			SA				
		L	T	H	L	T	H	L	T	H	L	T	H	L	T	H		
Classrooms are available for learners to study after school.	Freq	69	0	0	20	3	4	9	0	0	25	5	9	7	97	3	4	
	%	15	0	0	4	20	27	2	0	0	57	60	47	22	20	27		
Learners are called for counselling for not performing as expected.	Freq	29	0	0	10	9	5	0	9	0	26	9	8	9	34	2	6	
	%	6	0	0	24	33	0	2	0	0	60	53	60	8	13	40		
The school offers remedial classes for learners who are underperforming.	Freq	10	0	0	16	6	0	0	13	0	10	5	11	9	66	4	6	
	%	22	0	0	37	0	0	3	0	0	23	73	60	15	27	40		
The school reward learners who perform well in in their studies.	Freq	24	0	0	55	0	0	11	0	0	14	9	10	8	21	1	5	7
	%	5	0	0	12	0	0	2	0	0	33	67	53	47	33	47		
The school has a career and guidance day.	Freq	72	0	0	67	0	0	15	0	0	21	5	11	9	81	4	6	
	%	16	0	0	15	0	0	3	0	0	48	73	60	18	27	40		

Key: Freq = frequency, SD = strongly disagree, D = disagree, UD = undecided, A = agreed, SA = strongly disagree

who are underperforming while 27% teachers strongly agreed. More teachers (63%) also agreed that the school rewards learners who perform well academically while 33% strongly agreed.

It was also found that more HODs (47%) agreed that classrooms are available for the learners to study after school while 27% disagreed. Majority of the HODs (60%) agreed while 40% strongly agreed that the schools offer remedial classes for the learners who are underperforming. When asked whether the schools create career counselling day to motivate the learners, majority of HODs (60%) agreed and 40% strongly agreed with statement.

School management and supervision

Table 5 shows the frequencies of participants' responses on the school management and supervision in the study area. The table revealed that more learners (46%) agreed that there is inadequate supervision of teachers' work by the supervisors (principals and HODs), and 32% learners strongly agreed with the statement. The table also showed that more learners (34%) agreed that the HODs conduct class visits and 30% strongly agreed. When asked about whether the school management checks the learners' workbooks, majority of the learners (46%) disagreed while 19% agreed with the statement. Furthermore, more learners (47%) agreed and 23% learners strongly agreed while 17% disagreed that the parents are called in when learners do not perform as expected.

The table also revealed that 60% of teachers disagreed that there is inadequate supervision of teachers work by the supervisors while 20% of them agreed. There are 33% of the teachers who disagreed that the HODs conduct class visits at least once per term while majority of teachers (53%) agreed. The table also showed that more teachers (60%) agreed that learners who do not attend Biology classes are followed up and 20% disagreed. In addition, more teachers (47%) agreed that the parents are called in when learners do not perform as expected while 33% strongly agreed.

Furthermore, the results (Table 5) showed that majority of the HODs (80%) disagreed that there is inadequate supervision of teachers' work by the supervisors while 20% of the HODs agreed.

Table 5: Frequencies of participants' responses on school management and supervision

Statement		SD			D			UD			A			SA		
		L	T	H	L	T	H	L	T	H	L	T	H	L	T	H
There is inadequate supervision of teachers' work by the principals and HODs.	Freq	10	3	0	79	9	12	10	0	0	209	3	3	142	0	0
	%	2	20	0	18	60	80	2	0	0	46	20	20	32	0	0
The HODs conduct class visits at least once in a term.	Freq	89	0	0	56	5	4	14	0	0	155	8	7	136	2	4
	%	20	0	0	12	33	27	3	0	0	34	53	47	30	13	27
The school management checks learners' workbooks (exercise books).	Freq	56	0	0	209	5	5	21	0	0	87	7	5	77	3	5
	%	12	0	0	46	33	33	5	0	0	19	47	33	17	20	33
Learners who do not attend Biology classes are followed up.	Freq	107	1	0	175	3	4	11	0	0	84	9	11	73	2	0
	%	24	7	0	39	20	27	2	0	0	19	60	73	16	13	0
The management do nothing with the	Freq	92	6	4	160	9	11	33	0	0	107	0	0	58	0	0
	%	20	40	27	36	60	73	7	0	0	24	0	0	13	0	0

learners who do not perform well.																
The parents are called in when learners do not perform as expected.	Freq	36	0	0	78	2	0	21	0	0	212	7	9	103	5	6
	%	8	0	0	17	13	0	5	0	0	47	47	60	23	33	40

Key: Freq = frequency, SD = strongly disagree, D = disagree, UD = undecided, A = agreed, SA = strongly agree

There are also 33% of the HODs who agreed that the school management checks learners' workbooks (exercise books) while the same percentage disagreed. The table also revealed that 47% of the HODs agreed that the parents are called in when the learners do not perform as expected of them and 40% strongly agreed.

School discipline

The results in Table 6 show the frequencies of participants' responses on the school discipline in the study area. The results revealed that more learners (56%) agreed that in the schools, there are school rules and regulations while 21% disagreed and 9% strongly disagreed with the statement. More learners (41%) also disagreed that rules and regulations are displayed in the classrooms and 19% strongly disagreed while 26% agreed with the statement. The table further showed that 68% of the learners agreed that the principal and HODs help in maintaining discipline in the school while 16% of learners disagreed.

Table 6 also revealed that 27% of the teachers agreed while 73% strongly agreed that schools have clear rules and regulations. The table also showed that more teachers (47%) disagreed with the statement that rules and regulations are displayed in every classroom while 40% agreed. More teachers (73%) also agreed that the principal and HODs help in maintaining discipline in the school while 27% strongly agreed.

In addition, the table showed that 53% of the HODs agreed and 47% strongly agreed with the statement: In this school, there are clear rules and regulations. However, more HODs (53%) disagreed while 33% of them agreed that the rules and regulations are displayed in every classroom. The table also revealed that 80% of the HODs agreed that learners who misbehave are dealt with fairly and consistently and 20% strongly agreed with the statement.

Table 6: Frequencies of participants' responses on school discipline

Statement		SD			D			UD			A			SA		
		L	T	H	L	T	H	L	T	H	L	T	H	L	T	H
In this school, there are clear school rules and regulations.	Freq	39	0	0	96	0	0	8	0	0	253	4	8	54	11	7
	%	9	0	0	21	0	0	2	0	0	56	27	53	12	73	47
Rules and regulations are displayed in every classroom.	Freq	85	2	1	186	7	8	19	0	0	115	6	5	45	0	1
	%	19	13	7	41	47	53	4	0	0	26	40	33	10	0	7
Learners who misbehave are dealt with fairly and consistently.	Freq	47	0	0	113	0	0	14	0	0	204	8	11	72	7	4
	%	10	0	0	25	0	0	3	0	0	45	53	73	16	47	27

The Principal and HODs help in maintaining discipline in the school.	Freq	43	0	0	72	0	0	17	0	0	305	11	12	13	4	3
	%	10	0	0	16	0	0	4	0	0	68	73	80	3	27	20
The principal and teachers do not care about learners' indiscipline.	Freq	111	6	7	191	9	8	11	0	0	86	0	0	51	0	0
	%	25	40	47	42	60	53	2	0	0	19	0	0	11	0	0
The school properties are vandalised.	Freq	105	9	9	201	4	3	14	0	0	60	2	2	70	0	0
	%	23	60	60	45	27	20	3	0	0	13	13	13	16	0	0

Key: Freq = frequency, SD = strongly disagree, D = disagree, UD = undecided, A = agreed, SA = strongly disagree

Findings from the face-face interviews with teachers and HODs

Face to face interviews were held with two Biology teachers and two science HODs in order to get further insight on the school-based factors affecting Grade 12 learners' academic performance in NSSCO Biology in the study area as well as to explore how the Biology teachers' handle the factors so as to improve the learners' academic performance. The following findings emanate.

Teaching and learning resources

The interview revealed that the lack of teaching and learning resources such as laboratory equipment and teaching aids in the schools affects Grade 12 learners' academic performance in NSSCO Biology in the Khomas educational region. In the interview, teacher A submitted that:

“We don't have proper laboratories; we are using the classrooms to carry out some practical works. Sometimes, the equipment are also not there, you just do for example, the practical work with the little equipment that are available” (Interviews, Teacher A).

It was also revealed the schools that have laboratories experience problems with lack of equipment and chemicals in the laboratories while some of the available equipment are broken down. HOD B explained that the equipment in the laboratory do not work properly for example, gas taps and pipes leak and this constitute risk factor which makes it unsafe for the teacher and learners to use the laboratory.

In the interview, teacher B also stated:

“There are certain things that are being presented theoretically due to the fact that we don't have the resources for projecting the information and that affects the understanding of the kids because it seems, we are just forcing them to memorize without using a bit of practical understanding to able this kids recall or retrieve the information they have learnt” (Interview, Teacher B).

The interview also revealed that there is lack of current references books for Biology. According to one of the teachers interviewed, the textbooks they have contain insufficient or outdated information.

The Biology Syllabus

The interviews revealed that the lengthy Biology syllabus affects the learners' performance in NSSCO Biology. It was also revealed that the long Biology content of the syllabus hinders learning of Biology. This is what HOD A had to say:

“The lengthy syllabus content of Biology also hinders the proper learning of the facts as the learners may find it difficult to grab the facts given that they also have other subjects to study during the examination” (Interview, HOD A).

Classroom environment

The interviews revealed that the Biology classroom environment does affect the Grade 12 learners' performance in NSSCO Biology. The classrooms are not inviting or motivating learners to learn. During the interview this is what Teacher B had to say:

“The environment looks dull and it is just like a gathering room where you just enter, do what you have to do and off you go. There is nothing interesting in that environment and this tends to psychologically affect the capabilities of learners' brain” (Interview, Teacher B).

The learning environment should promote learning and it is the responsibility of the subject teacher to make the classroom inviting to learn.

Commitment from the school management

The interview revealed that the commitment from the school management affects the academic performance of learners in NSSCO Biology in the study area. School management needs to do class visit so that they can monitor the work of teachers. This is what one HOD had to say:

“Commitment of management.... head of department is supposed to monitor the progress of the teachers and department and how they teach because those teachers also need assistance somewhere, somehow in the process of teaching (Interview, HOD A).

Overcrowded classroom

The high number of learners to teacher ratio also affects the teachers' efficiency. The teachers find it difficult to attend to the individual learners who may need more attention. This is what an HOD had to say:

“a teacher is forced to have more than 40 learners in a class (Biology), and one will not pay attention to each and every learner. For instance, my former grade 12 learners were 43 in just one class. It is a very big headache for the teacher to cover the syllabus, explain to enable the learners understand, and again attend to the practical work, and the time is so limited” (Interview, HOD B).

How the Biology teachers handle the school-based factors so as to improve Grade 12 learner' academic performance in NSSCO Biology

The interviews with the Biology teachers and science HODs found that the teachers used the following strategies in an attempt to improve the academic performance of Grade 12 learners in NSSCO Biology in the Khomas education region.

- i. The Biology teachers formed network of professional colleagues within the same school cluster where they get assistance from their colleagues in other schools e.g for some resources sharing.
- ii. The teachers together with regional education directorate conduct afternoon and holiday classes for Biology in order to complete the Biology syllabus content. The teachers sensitized the parents and guardians of the learners about the benefits of the extra classes and urged them to encourage their children to attend.
- iii. The teachers improvise on the limited resources that are available and sometimes, they device their own teaching materials to carry out Biology practical work.

DISCUSSIONS ON THE FINDINGS

The purpose of the current study was to identify school-based factors that affect academic performance of Grade 12 learners in NSSCO Biology in the Khomas educational region. Following is a discussion of such factors and how they are dealt with in order to improve academic performance in NSSCO level Biology.

The current study has shown that lack of relevant teaching and learning resources, long Biology syllabus, poor classroom environment, insufficient laboratory equipment, lack of commitment from the school management and overcrowded classes are school-based factors that affect Grade12 learners' academic performance in NSSCO level Biology in Khomas Educational Region.

The interview revealed that lack of relevant teaching and learning resources affects the Grade12 learners' academic performance in NSSCO Biology in the study area. These findings corroborate the reports by Namupala (2013) and Stephanus (2008), which indicated that lack of instructional resources affects academic performance of learners. In another report, Zimba,et al. (2013) noted with concern, the lack of teaching aids in schools. This has profound effect on learners' academic performance because teachers will not teach effectively. Moreover, research finding has shown that schools with adequate resources perform better than those with inadequate resources (Mudulia, 2012).

In the study area, it was also found that the long Biology syllabus affects Grade 12 learners' academic performance in NSSCO Biology. Dillion (2008) as cited by Lebata and Mudau (2014) also acknowledged that Biology syllabus is overloaded with facts and that it is long. Given the limited lesson time (40 minutes per lesson) provided on secondary schools' teaching timetable in Namibia, it makes it difficult for Biology teachers to complete the long NSSCO Biology syllabus. Kimani et al. (2013), noted that the time when teachers complete the syllabus has an effect on learners' academic achievement in secondary schools. Etsy (2005) also found that teachers' inability to complete the syllabi contributes to low academic performance among learners. It is therefore, important that the Biology syllabus content is covered before the learners start examination because when the syllabus is covered, it gives

learners confidence in the examination knowing that they have learned the content (Mukhwana, 2013).

The study also found that overcrowded classrooms affect Grade 12 learners' academic performance in NSSCO Biology in the study area. In a separate report, Namupala (2013) and Stephanus (2008) also noted that over crowdedness in classrooms affects learners' academic performance. Classes that are overcrowded lead to teachers making use of teacher-centred approaches which do not actively engage the learners (Dabo, 2015). It has been reported that teachers' provision of individualized attention to weak learners has an effect on academic achievement in secondary schools (Kimani et al., 2013). This means that in less crowded classrooms, learners may receive individual attention and are more likely to perform better.

Furthermore, the study revealed that lack of commitment from the school management affects learners' academic performance in NSSCO Biology. In a study on the factors affecting grade 11 learners' performance in Mathematics as perceived by learners, teachers and principals, Stephanus (2008) found that some of the supervisors fail to perform their duty of conducting class visits and where they do, they (supervisors) fail to give constructive feedback to the teachers which could help them to improve teaching and classroom management. Leithwood et al. (2004) noted that of all the factors that contribute to what learners learn at school, leadership is second in strength only to classroom instruction. Providing instructional guidance is an important leadership practice which the school leadership should employ (Leithwood et al., 2004). Through class visits the Principals and HODs will be able to assess teachers' work and provide professional development where necessary which in the long run will contribute positively to learners' performance in Biology.

Other school-based factors that were found in the study which could affect the academic performance positively are: learners were provided with support where learners who did not perform well are given counselling and those who performed well were given awards. The schools also provided classrooms for learners to study after school.

Among the strategies the Biology teachers used to handle the school-based factors are: teachers' networking among professional colleagues within the school clusters in order to share ideas and resources; organising afternoon and holiday classes to cover the Biology syllabus, and improvising on the limited materials and teachers making own devices. Lebata and Mudau (2014) had reported that in order to improve learners' performance in Biology, teachers gave remedial classes, improvising, developing cluster system and team teaching.

IMPLICATION TO RESEARCH AND PRACTICE

The current study has shown that certain unrecognised factors are affecting the academic performance of Grade 12 learners in the Namibia Senior Secondary Certificate Ordinary level. Apart from the school-based factors investigated in this study, there could be other factors that are learner-based, teacher-based and even demographic variables affecting the academic performance of the Grade 12 learners. Thus, future research should also investigate these other factors with a view to developing encompassing mitigation strategies.

CONCLUSION

The study found that school-based factors which affect Grade 12 learners' academic performance in NSSCO Biology in the Khomas educational region include: lack of relevant teaching and learning resources, lack of laboratory equipment, lengthy NSSCO Biology syllabus, overcrowded classrooms, classroom environment not attractive for learning, and lack of commitment from the school management. In dealing with these factors in an effort to improve the learners, academic performance, the Biology teachers adopted the following measures: forming network of professional colleagues within the same school clusters in order to share ideas and resources, organising after school classes, and improvising on the limited teaching materials. While the measures taken by the teachers are commendable, it is recommended that: school management should engage government and donor agencies as well as private/philanthropic organisations for the provision of relevant teaching and learning resources, and laboratory equipment. The schools management should also step their supervisory role as it is an important part of quality assurance measures that could support teaching and learning.

Acknowledgement

The authors greatly acknowledge the approval granted by the University of Namibia's Centre for Postgraduate Studies to undertake this study as a master degree thesis. We are also thankful to the permanent secretary, Ministry of Education and the schools' Principals for the permission granted to carry out the study in senior secondary schools offering NSSCO Biology in the Khomas educational region. Finally, we thank the study participants for their voluntary participations in the study.

FUTURE RESEARCH

Considering that the Namibia Senior Secondary Certificate Ordinary level is the gateway to tertiary academic careers of the Grade 12 learners, it is important that future research in the study area should investigate the learner-based factors, teacher-based factors and even demographic variables affecting the academic performance of the Grade 12 learners and identify appropriate mitigation strategies.

REFERENCES

- Aikenhead, G. S. (1996). Science Education: Border Crossing into the Subculture of Science. *Studies in Science Education*, 27, 1-52.
- Ajayi, I.A. (2012). *Mass failure of students in West African Senior School Certificate Examinations (WASSCE) in Nigeria: The teachers' perspective*. The Clute Institute.
- Akinfe, E., Olofinniyi, O.E., and Fashiku, C.O. (2012). Teachers' quality as correlates of students' academic performance in the biology in senior secondary schools of Ondo state, Nigeria. *Online Journal of Education Research*, 1(6), 108-114. accessed on 25 Jan 2015.
- Dabo, J.I. (2015). The effects of teacher-pupil ratio on teaching-learning process in Bauchi state primary school. *International Journal of Science, Environment and Technology*, vol. 4 (4), pp. 1218-1225.

- Dean, J. (2002). *Implementing performance management: A handbook for schools*. London: Routledge Falmer.
- Directorate of the National Examinations and Assessment (DNEA), Namibia.(2013). *National distribution of symbols November 2013 NSSC (Gd 12) - ordinary level full time*.<http://www.dnea.gov.na/document/417550/720851/National> Accessed: July 7th, 2014.
- Directorate of the National Examinations and Assessment (DNEA), Namibia.(2012). *National and regional distribution of symbols November 2012 NSSC (Gd 12) - ordinary level full time*.<http://www.dnea.gov.na/document/417550/417898/National>, Accessed: July 7th, 2014.
- Directorate of the National Examinations and Assessment (DNEA), Namibia.(2011). *National and regional distribution of symbols November 2011 NSSC (Gd 12) - ordinary level full time*.<http://www.dnea.gov.na/document/417550/418142/National>, Accessed: July 7th, 2014.
- Directorate of the National Examinations and Assessment (DNEA), Namibia.(2010). *National distribution of symbols November 2010 NSSC (Gd 12) - ordinary level full time*.<http://www.dnea.gov.na/document/417550/418227/National>, Accessed: July 7th, 2014.
- Education Management Information Systems (EMIS) (2012, August). *Education Statistics 2012*. Windhoek: Directorate of Planning and Development: Ministry of Education.
- Epri, M.L. (2016). A case study on the impact of large classes on student learning. *Contemporary PNG studies: DWU Research Journal*, vol.24, May, Pp. 96-109.
- Etsy, K. (2005). Causes of Low Academic Performance of Primary School Pupils in Theshamia Sub-Metro of Shama Ahanta East Metropolitan Assembly of Ghana. Regional Conference of Education in West Africa, Dakar Senegal, 1 -2 November 2005.
- Jackson, M.M. (2009). *An investigation into the factors contributing to the poor performance of grade 12 (COSC) learners in Lesotho*. Master's Thesis, University of Zululand.
- Kimani, G.N., Kara, A.M., and Njagi, L.W. (2013). Teacher factors influencing students' academic achievement in secondary schools in Nyandarua County, Kenya. *International Journal of Education and Research* 1(3), pp 1-14.
- Lasisi, S.O. (2001). *Effects of three instructional media in students' teacher learning outcome: Selected teaching skills*. Unpublished M.Ed Dissertation. University of Ibadan, Ibadan.
- Lebata, M.C. and Mudau, A.V. (2014). Exploring factors affecting performance in Biology 5090 at selected high schools in Lesotho. *Mediterranean Journal of Social Sciences*, 5(8), pp. 271-278. doi: 10.5901/mjss.2014.v5n8p271
- Leithwood, K., Louis, K.S., Anderson, S. and Walstrom, K. (2004). How leadership influences student learning. The Wallace Foundation
- Mudulia, A.M. (2012). The relationship between availability of teaching/learning resources and performance in secondary school science subjects in Eldoret Municipality, Kenya. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS)*, 3(4): 530-536. jeteraps.scholarlinkresearch.org
- Mukhwana, W.J. (2013). The role of student-related factors in the performance of biology subject in secondary schools in Eldoret Municipality, Kenya. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS)* 4(1): 64-73.

- Namupala, S. (2013). *Factors that contribute to poor performance among grade 10 learners in Onamutai Circuit Oshana region in Namibia*. Unpublished Master Thesis. University of Namibia, Windhoek.
- Nyoroge, P.M. and Nyabuto, A.N. (2014 January). Discipline as a factor in academic performance in Kenya. *Journal of Educational and Social Research*, 4(1), 289-308. DOI: 105901/jesr.2014.v4n1p289
- Ragan, T.J., Smith, P.L., and Cuda, L.K. (n.d). *Outcome-Reference, Conditions-Based Theories and Models*. www.faculty.ksu.edu.sa, Accessed: April 20th, 2016.
- Robinson, V.M.J., Lloyd, C.A. and Rowe. (2008). The impact of leadership on student outcomes: An analysis of the different effects of leadership types. *Educational Administration Quarterly*, 44: 635. DOI: 10.1177/0013161X08321509
- Stephanus, G.H. (2008). *Factors affecting grade 11 learners' performance in math as perceived by learners, teachers and principals in selected secondary schools in the Omusati Education region*. Unpublished Master Thesis. University of Namibia, Windhoek.
- Zimba, R.F., Mufune, P., Likando, G. and February, P. (2013). Namibian teachers' understanding of education for all issues. University of Namibia, *Journal for Studies in Humanities and Social Studies*, vol.2 (1) June, pp. 169-186.