# CHALLENGES AFFECTING GRADE 12 LEARNERS' ACADEMIC EXAMINATION PERFORMANCE IN NAMIBIA SENIOR SECONDARY CERTIFICATE ORDINARY LEVEL BIOLOGY IN THE //KHARAS REGION, NAMIBIA

**A THESIS SUBMITTED IN PARTIAL FULFILMENT**

**OF THE REQUIREMENTS FOR THE DEGREE OF**

**MASTER OF EDUCATION**

**(SCIENCE EDUCATION)**

**OF**

**THE UNIVERSITY OF NAMIBIA**

**BY**

**VICTORIA N VERNER**

**200827120**

**APRIL 2019**

**SUPERVISOR: DR. J. ABAH**

**CO-SUPERVISOR: DR. H. U. KANDJEO-MARENGA**

**ACKNOWLEDGMENT**

I would like to thank the Almighty God for taking me through this academic milestone which I believe would not have been possible without His wisdom, power and guidance. I would not have managed to accomplish the program without His courage.

I want to express my sincere gratitude to my supervisors, Dr J. Abah and Dr. H.U. Kandjeo-Marenga for supervising, encouraging as well as challenging me throughout this academic program. I wholeheartedly thank them for the guidance and patience in helping me to successfully complete this study.

I would like to thank my friend Leena Kanandjebo for encouraging me through this journey. Ms Loide Shuudifonya, thanks for always being there to assist me and praying for me and may God continue to bless you. To Emilie Washekuna, thanks for providing accommodation during my data collection period. A special thanks goes to the director of //Kharas Region, principals, management, teachers as well as learners who participated in this study.

Thank to my sisters Rebeka Nampungu and Aina Uushona for always being there for me! Sherly /Gomes, Mayta Lamek, Rebekka Enkali, Laina Shipingana, Teopolina Amutenya and Martha Johannes, thanks for each assistance you offered during my whole study time and may God make all your dreams come true.

I would also like to thank my Aunt, Hilma Tweumuna for taking my education seriously and encouraged me to value my education so much. You laid a strong foundation on which I stand today since my childhood and it is the reason that I am still trying to aim higher and with may God's the sky becomes limitless. May God continues to bless you all the time.

## DEDICATIONS

The thesis is dedicated to my daughters: Beverly Joy Ruben, Joolokeni Ndaliloshiwa Shangano and My son Pohamba Nghuulondo. May my study serve as a motivation to them and they may take their education seriously.

**DECLARATIONS**

I, Victoria Namene Verner, hereby declare that this study is my own work and is a true reflection of my research, and that this work, or any part thereof has not been submitted for a degree at any other institution of learning.



…….

**Victoria Namene Verner** **Date**

**ABSTRACT**

The main purpose of this study was to investigate the challenges affecting Grade 12 learners' academic performance in Namibia Senior Secondary Certificate Ordinary level (NSSCO) Biology in the //Kharas Region, Namibia. The study addressed three research questions. Two categories of sample, made up of 140 learners and 12 teachers respectively were selected using the simple random sampling method to participate in the study. Furthermore, after the preliminary analysis of the questionnaires, a sub-sample of 12 learners and seven teachers that completed the questionnaires was purposively selected to participate in the interview. Descriptive statistics (percentages) and thematic analysis method were used to analyse the quantitative and qualitative data respectively. The study found out learners' challenges such as lack of learning materials, learners' indiscipline and lack of motivation; teachers' challenges such as lack of teaching materials or laboratory facilities, lack of teaching experience, under qualified teachers, lack of subject content knowledge, etc., as some of the major factors affecting Grade 12 learners' academic performance in NSSCO Biology. In dealing with the identified challenges, the Biology learners and teachers were of the opinion that the following measures could be employed to improve the grade 12 learners' academic performances: (a) introducing spring school or holiday classes to cover excess workload and help slow learners; (b) giving motivational speeches to encourage the learners; (c) organising periodic training workshops for the teachers; and (d) more involvement from subject advisors to guide teachers with subject knowledge; as well as (e) tackling learners' disciplinary problems. Thus, the study recommended that the Ministry of Education must address the challenge of lack of Biology teaching and learning materials

in the //Kharas Education Region to improve learners' academic performance as well as to develop management strategies at all levels at the school in addressing learners' disciplinary behaviour as this has a far-reaching implication on both teaching and learning outcomes.

**TABLE OF CONTENTS**

**List of Tables**

**List of Figures**

## LIST OF ACRONYMS

| | |
|---|---|
| DNEA | Advance Certificate in Education |
| BETD | Basic Education Teachers Diploma |
| NDEA | Directorate of National Examination |
| EMIS | Educational Management Information System |
| HoD | Head of Department |
| MoE | Ministry of Education |
| NAMCOL | Namibia College of Open Learning |
| NSSC | Namibia Senior Secondary Certificate |
| NSSCO | Namibia Senior Secondary Certificate Ordinary Level |
| NUST | Namibia University of Science and Technology |
| NIED | National Institute for Educational Development |
| TRC | Teacher Resources Centre |
| UNAM | University of Namibia |

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the study

Science embraces every attempt made by humans to explore, interpret and manage the natural world (Garuba, Agweda, & Abumere, 2012). According to Anderman, Sinatra, and Gray (2012), science education is very crucial for the youth because they are confronted with massive scientific challenges such as escalating HIV/AIDS pandemic, global climate change, world hunger, space exploration, as well as the development and execution of alternative sources of energy. In agreement with this assertion, the Ministry of Education (2014) reveals that the Namibian society is also confronted with similar scientific risks and challenges. As the pace of scientific research accelerates, the average citizens are increasingly faced with having to grapple with matters of science in their everyday life (Marincola, 2006). Thus, it is imperative that the public is engaged in science issues which have an impact on their lives and in their own self-interest in order to best thrive in modern society (Marincola, 2006).

Reportedly, the natural sciences are one of the main drivers of the transformation of today's society and the world (MoE, 2010). However, several factors may affect learners' good academic achievement in sciences. Ajayi (2012), reported that learners themselves, teachers, government commitment, parents'/guardians attitudes, and school's management can variously contribute to learners' poor academic performances.

Towards improving teaching and learning outcome, the Ministry of Education, Art and Culture in Namibia recommended the learner-centred teaching approaches in which learners take the centre stage of their learning (Ministry of Education and Culture (MEC), 1993). Despite this step, other factors such as lack of facilities, learner support materials and excessive work load for teachers (Rammala, 2009) posed challenges that may affect learners' academic performances.

In particular, Biology is one of the science subjects taught at senior secondary school in Namibia, following two different levels, that is, Namibia Senior Secondary Certificate Ordinary level (NSSCO) and Namibia Senior Secondary Certificate Higher level (NSSCH) at grade 11-12. The academic performance of learners in the NSSCO level examination in the //Kharas region of Namibia has been quite unimpressive. According to the MoE's reports, the percentage of learners that obtained E, F, G, and U symbols in NSSCO Biology level in the //Kharas region are: 2012- 90%, 2013- 83%, 2014- 85%, 2015- 84% and 2016- 86% (Directorate of the National Examinations and Assessment (DNEA), 2017). Learners who are in these range categories of symbols do not secure a place of admission into institutions of higher learning in Namibia were a minimum of 25 points is needed to be registered at such an institution. Thus, unfortunately, E, F, G and U symbols are the non-priority symbols which contribute to less than the minimum of 25 points that a candidates are supposed to obtain in at least five subjects in order to secure admission into degree programs at the University of Namibia (UNAM) and Namibia University of Science and Technology (NUST). Thus, if not investigated and remediation strategies developed, these consistent poor performances could have

negative impacts on the future educational careers of the learners and the education system in Namibia.

Schreuder and Coetzee (2008) reveals that "Career survival in the 21st century requires inter alia, commitment to skills development, self knowledge and perpetual learning" (p. 85). It is against this background that the current study investigated the challenges affecting learners' academic examination performance of Grade 12 NSSCO Biology in the //Kharas Region.

### 1.2 Statement of the problem

Analysis of the Grade 12 NSSCO Biology level examinations result for the //Kharas Region shows that in the past five consecutive years (2012 - 2016), a high percentage of the NSSCO Biology learners have been performing poorly in the subject and obtaining the non-priority symbols: E, F, G, and U. The percentage of learners who scored in the E, F, G and U symbols were 2012 - 90%, 2013 - 83%, 2014 - 85%, 2015 - 84% and 2016 - 86% (Directorate of the National Examinations and Assessment (DNEA, 2012, 2013, 2014, 2015 and 2016).

These consistent poor academic examination performances could have been attributed by several challenges that the NSSCO Biology teachers and learners might have experienced during instructions. Despite the grade 12 learners' consistent poor performances in NSSCO Biology in the //Kharas region, no documented research has been carried out with a view to identifying the teacher and learner challenges and

devising mitigation actions to increase Biology learners' academic performance in the //Kharas Region. This therefore, creates a literature gap that needs to be filled.

Achor, Agogo and Orokpo (2011) concur that learners' failure of science examinations does not only pose a threat to science teaching and learning but also to technological developments both present and in in future in various countries and that is why they make an urgent call to Government of such countries to make an afford to address challenges in the science education.

Schneider and Plasman (2011) points out that teaching and learning science is difficult for both teachers and learners and that they (teachers and learners) should be continuously be guided on how to develop important scientific skills as well as assist teachers to create opportunities for learners to be actively involved in science learning environments. For most novice Biology teachers and other underqualified and underqualified or professional educators without teacher-training diplomas who are currently teaching the subject, should be reminded that creating active learning environment to enhance learners' performance is a herculean task. Once the Biology learners are not properly guided, they may continue to perform poorly year after year.

This study, therefore, investigated challenges that teachers and learners experience in NSSCO Biology which contribute to grade 12 learners' poor performance in NSSCO Biology level in the //Kharas region.

## 1.3 Research questions

The research questions are as follows:

1. What are the challenges experienced by NSSCO Biology teachers affecting the learners' academic examination performance in Grade 12 NSSCO Biology in the //Kharas Region?
2. What are the challenges experienced by Grade 12 NSSCO Biology learners affecting their academic examination performance in the //Kharas Region?
3. What do the NSSCO Biology teachers perceive as possible solutions to overcome the challenges they experience?

## 1.4 Significance of the study

The outcome of this study will provide detailed information on the challenges experienced by NSSCO level Biology teachers and learners that affect Grade 12 learners' academic examination performance in NSSCO Biology level in the //Kharas region in Namibia and elsewhere where is applicable. The likelihood that teachers and learners are experiencing major challenges is there that might impact learners' academic examination performance of learners in NSSCO Biology level in the region. Thus, finding out the challenges might be a useful way towards ameliorating the future development of machineries/mechanisms that could improve Grade 12 learners' academic examination performance in the school subject in //Kharas education region. The study envisages to provide useful recommendations to the Ministry of Education to

enable them to develop strategies that could help the teachers and learners to overcome these challenges in teaching and learning of NSSCO Biology in Namibia.

### 1.5 Limitations of the study

It is envisaged that there may be misplacement of questionnaires by the participants. Therefore, the researcher will request the assistance of class teachers to administer the learners' questionnaires and collect them the same day while the teachers' questionnaires will be administered and collected the following day to minimize possible losses.

### 1.6 Delimitations

The study involved the Grade 12 NSSCO Biology teachers and learners in the //Kharas education region only, because they are in the geographical region to be covered in this study and hence, the results will not be generalised across Namibia. The study will concentrate on the challenges faced by NSSCO Biology teachers and grade 12 learners in the //Kharas region.

### 1.7 Definition of terms

For the purpose of the study the following terms are defined as they were used and understood:

**Academic performance:** This refers to how well a learner has done in the NSSCO Biology level end of year examination.

**Teacher's challenges:** it refers to the factors that hindering teachers to have constructive instructions which in turn may affects learners' academic performance e.g teaching methods used, teachers' competencies, and availability of resources.

**Learner's challenges**: This refers to the factors that are impinging or hindering learners to perform well in examination or assessment of subject content which affects learners to learn effectively and so reduce their academic performance- e.g, discipline and learning strategies.

### 1.8 Lay-out of the thesis

The study consists of five chapters.

**Chapter 1** offers the orientation to contextualize the research problem, the statement of the problem, significance, limitations and research questions as well as the definitions of key concepts as they should be understood in this study

**Chapter 2** reviews the literature regarding the challenges that teachers and learners experience when teaching and learning NSSCO Biology in the //Kharas region. The chapter further reviewed the literature on the possible solutions on how to overcome the challenges they experience in NSSCO Biology.

**Chapter 3** covers the research methodology and design. In this chapter, the research design, data generating methods, instruments used to generate data, the population, sample and sampling procedures, data analysis procedures as well as research ethics were explained.

Presentation of the research findings were done in **chapter 4**. The data collected from the school teachers and learners were presented in this chapter according to the research questions.

In **chapter 5**, the discussions of the data were presented. The research questions were answered here as the data was made sense of. The chapter further provided conclusions and recommendations arising from the study. Suggestions for further research were also given in this chapter.

### 1.9 Summary

In this chapter the researcher provided the orientation of the study on investigating challenges affecting Grade 12 learners' academic examination performance in NSSCO Biology in the //Kharas Region in Namibia. The researcher also outlined the nature of the problem being researched, the research questions that helped answer the problem, and the significance of the study. The study further outlined limitations and delimitations of the study, definition of terms, and lay-out of the thesis. In the next chapter the researcher will investigate different sources of literature to bring light on the research questions.

# CHAPTER TWO

# THEORETICAL FRAMEWORK AND LITERATURE REVIEW

## 2.1 Introduction

The first section of this chapter discusses the theoretical framework on which this study was based, while the second section focuses on the review of literature to determine what has already been conducted locally, nationally and internationally on the challenges affecting teachers' instructions and learners' academic examination performance in Biology the secondary schools. The latter also discusses possible solutions to overcome the observed challenges to improve learners' academic examination performance in Biology at secondary level.

## 2.2 Theoretical framework

This study is based on the propositions of the Conditions-Based Theory (CBT) (Ragan, Smith & Curda, 2008). The Conditions-Based Theory states that:

(1). Learning goals can be categorized into learning outcomes or knowledge type;

(2). Acquisition of the different learning outcome category requires different internal conditions;

(3). Learning outcomes can be represented in a predictable pre-requisite relationship;

(4). Different internal processes are supported by identifiably different instructional support (p. 386-387).

The second proposition relates to the current study because the poor academic performances of Grade 12 learners in NSSCO Biology examination may be influenced by various internal conditions such as teacher qualifications, classroom and school environment (working conditions); learners' attitude, ability to learn and disciplinary behaviour among other challenges as faced by teachers and learners in the teaching and learning environment respectively. In Biology the content has a variety of learning outcomes that requires knowledge retrieval and practical skills. Ragan, Smith and Curda (2008) reveal that "Gagné suggested that the cognitive processes of retrieval of prior knowledge, encoding, and retrieval and transfer of new learning would differ significantly in nature, depending on the type of learning goal" (p. 387) that includes the nature of the learning ability of various learners.

The fourth proposition states that different learning outcomes require different external conditions that applies to Biology Education, that is, the way in which its content and practical skills are taught. The different learning outcomes for practical skills and learning subject content (theories) may be best achieved with different types of instructional support (Ragan, Smith & Curda, 2008). Hence, identifying the challenges and different possible supports through research evidences are critical in order to design appropriate teaching and learning strategies that could improve the learners' academic performance in NSSCO Biology.

The next section will discuss the challenges as described in the extant literature. Firstly, the discussion will focus on the various challenges faced by teacher and learners in the

teaching and learning environment. Secondly, discussion on possible solutions to ameliorate the challenges will follow. Mostly, internal conditions/factors to teachers, learners, school environment, that is, the school environment and the classrooms are but some of the challenges that hinder learners to perform academically well in examinations.

## 2.3 Challenges in teaching and learning Biology

The discussions in this section focuses on providing explanations and descriptions on the various internal conditions and/or processes as these may affect the acquisition of various learning outcomes as well as the instructional support given by teachers to improve on learners' academic performance in various science content.

### 2.3.1 Teaching methods versus learning strategies

Biology is a practical subject to a certain extent, the way teachers teach topics vary from one topic to another. Thus, the way teachers teach and assess Biology could be regarded as some of the factors affecting learner academic performance as these factors are inherent or internal conditions to teachers. Generally, Biology is taught "differently in different schools due to lack of teaching aids and the teaching style" (Lebata & Mudau, 2014, p. 277) which could play a very important role in the learners' academic performance. The teaching styles as part of the internal condition varies from teacher to

teachers and in turn seem to be affected by the availability of the teaching materials or teaching aids.

The development of pedagogical content knowledge is also crucial for science teachers as it allows them to make decisions about how to teach specific content. Mhlamvu (n.d) adds on that pedagogical content knowledge is crucial when teaching complex topics and using new approaches to promote learners' interest and understanding. For example, cooperative learning has been proved to be effective in teaching science due to improving learners' individual academics achievement as well as in developing their social skills (Agashe, 2004) through which learners learn from one another. In addition, some teachers might not have gained the appropriate pedagogical content knowledge in applying discovery methods in the teaching and learning environment to teach science content well through guided or unguided inquiry or the experimental approach (Aladejana & Aderibigbe, 2007, p. 500). Pedagogical content knowledge of the teachers as based on the internal processes propositions of Ragan, Smith and Curda (2008) could be used in supporting which instructions methods to employ when teaching identifieable science content. If the specific teacher lacks the pedagogical content knwoledge on how to approach a certain science topic/content inturn, that could contribute to lack of instructional support to teach the science content effectively. The condition could also be worsened if there are lack of teaching materials to support the learning processes.

According to Anderman, et al., (2012) "Learning about science requires the coordination of a complex set of cognitive, affective, motivational strategies and skills" (p. 4). In addition, they state that learners have the ability to think and give reasons, but their

ability should be nurtured for a number of learners as some learners do not have the prerequisite knowledge.

Similarly Harris and Rooks (2010) are of the opinion that teachers should show learners new ways of how to learn and create platforms where they can learn scientific content. Majority of the learners have great potentials to learn in most cases but they do not know how to go about it and mostly tend to learn through tactile learning, which might be of concern if teachers do not give continuous 'instructional support' (Raga, Smith & Curda, 2008, p. 387). Additionally, Piaget (1969) is of the opinion that learners should be given the opportunity to discover new knowledge through spontaneous interaction with the environment - a rich classroom or school environment to give the learners a chance to discover new information, hence making teaching better and improving learners' academic performance in improving such school conditions.

### 2.3.2 Teacher qualification

There are a number of teachers who are not professionally trained in the schools teaching science subjects in Namibia and many science teachers were trained in the era when teacher-centred approach was the main approach to teaching and learning. In agreement with Kasanda (2004) who states that even education learners who undergo teaching practice as part of their studies at the University in Namibia do "experience reality shock when they finally start teaching" in schools (p. 4). Eiser and Knight (2008) state that most science teachers who are qualified based their instructions on what they have been trained, but there lack continous professional development that could assist

them in being updated with the existing and relevant knowledge which they could use to actively involve and teach their learners in science. The assumption is that if teachers receive contionous professional development, they will learn new scientific knowledge that is contionously being revealed as well as new teaching approaches on how to teach specific topics that they struggle with. In addition, teachers who have no teacher training diplomas could have less knowledge on how to teacher due to lack if teaching practice during their University trainings. Thus, such lack of knowledgencould affect learner academic performance as thode teachers teaching them lacks appropriate training.

Lebata and Mudau (2014) also reveal that the qualities of trained teachers are some of the factors that could affect the academic performance of learners. Lebata & Mudau (2014) concur with Eiser and Knight that for example, Biology teachers should read the latest discoveries on Biology and should have inservice training as a manner of improving their professional development. It will enrich their knowledge and allow them to keep up to date with the latest and relevant information. For example, teachers seem not to have littles qualities due to the fact that they are non-certified teachers. Lebata and Mudau (2014) reveal another view that:

> *"There is high rate of absenteeism among teachers and lack of commitment. Most teachers do not attend Biology lessons as expected and this, of course, affect Biology 5090 performance negatively as they fail to finish the syllabus on time, and do not have enough time for learners." (p.275).*

Hence, one may conclude that lack of teachers' commitment can lead to underperformance of teachers. Thus, Hollins (2011) is of the opinion that the need to clearly defined process for learning to teach and a standard for quality teaching in other word, learning to teach should "integrates academic knowledge and experience for teaching practice in an authentic context guided by a theoretical perspective and a philosophical stance" (p. 396). It is believed that preparation is key to success, hence in education in order for quality teaching to take place teachers need to prepare well. Hollins (2011) emphasises that:

> *"Teaching is a complex and multidimensional process that requires deep knowledge and understanding in a wide range of areas and the ability to synthesize, integrate, and apply this knowledge in different situations, under varying conditions, and with a wide diversity of groups and individuals. In quality teaching, this knowledge is applied in ways that provide equitable access and opportunities that build upon and extend what learners already know in facilitating the ability to acquire, construct, and create new knowledge." (p.395).*

In order to apply the knowledge to different learners with different needs, I therefore strongly concur with Hollins that preparation is crucial in order to give quality education. It is so that when teachers get in the field they should have a strong foundation and are well equipped in both dealing with the science content as well as the science of teaching. These are some of the internal conditions that educators need to

nurture into their future teachers and continuously provide such information to teachers who are already in the field as part of their professional development programmes.

### 2.3.3 Attitude and discipline of teachers and learners

Learners aslo form part of the internal conditions of both teachers and learners. In the school setting, learners usually look up to their teachers as role models and teachers play a great role in how learners view/behave towards their subject. Borna (2015) states that "teachers' attitude toward learners can motivate the learners toward learning and lead them to the way of achieving successful self-image" (p. 301). This can be achieved through encouragement and support.

On the otherhand, learners tend to disregard the work assigned to them by teachers and a number of them also do not show any interest in their school work (Lebata & Mudau, 2014). Jackson (2009) has the opinion that:

> *"…lack of learner discipline contributes to poor performance because some learners are ill disciplined, uncontrollable, and difficult to work with in class, some deliberately ignore instructions from teachers, while some leave the class during lessons, come to school late or disappear before school close." (p. 275)*

With such behaviour, the teacher might lose control of the classroom and other learners might be observing this behaviour and start thinking that it is the right thing to do.

Bullying is another factor that arise in schools and it also seem to negatively affect learners' academic performance if left unattended in developing improved self-esteem in learners which is a factor that could improve academic performance (Goodman, 2001). Hence, some of the interventions might be effective to some learners and not to others.

Farrington, Roderick, Allensworth, Nagaoka, Keyes, Johnson, and Beechum (2012) found that:

> *"Academic behaviours might also affect students' grades indirectly by influencing the nature of student-teacher interactions. Teachers may have preference for students who exhibit positive academic behaviours, teachers may spend more time helping these students or more closely monitor their learning, such that students who demonstrate positive academic behaviours receive a differential instructional benefit that improves their performance in a class." (p.16).*

This is true as teachers are more likely to associate with those that are willing to learn and lose interest in those that do not possess a positive academic behaviour. Learner indiscipline may also lead to habitual truancy which can be defined as "unexcused absences from school by a minor that exceed the number of such absences allowed" (David, 2014, p. 24). Leaners' absenteeism can cause the learners to miss out on important class work and practical work which might contribute to poor academic performance in Biology. Mosibudi (2012) reveals that absenteeism causes disturbances in class because absentees need the teacher to repeat what they missed, which cause

good attendees to stand still, some will be bored and then misbehave; this will negatively affect the classroom learning environment.

Lastly, Mosibudi (2012) defines motivation as "a fundamental recipe for high level academic performance of learners" (p. 25). For example, a learner can make good progress if he/she is motivated by his/her subject teacher and thus, they can develop a good mutual relationship where the teacher and the learner are motivated to accomplish one mission, which is good academic performance (Mosibudi, 2012). In addition, Borna (2015) is of the opinion that learners get motivated through their teachers, if they observe that the teacher is enthusiastic about the subject, they also try to do the same. Majority of learners look up to their teachers as role models and would like to turn out just like their teachers. Both teachers and learners' internal motivation is one of the internal conditions that need to be nurtured. Usually, if learners' past experience have an effect on their level of current motivation. For example, if learners do not enjoy the subject or how the teacher is approaching the teaching, it might cause learners to be less motivated and to develop negative attitudes towards the subject. It is revealed that when teachers use activity-based teaching, a number of benefits furnish such as favourable attitudes and high motivation level (Aladejana & Aderibigbe, 2007). Learners should be motivated internally to learn by providing continuous rewards to raise their eagerness to learn (Rammala, 2009). Borna (2015) found that "teachers can motivate the learners by making sure that the class atmosphere is relaxed and pleasant" (p. 304) to ensure that the language used in class is interesting to enhance a good student-teacher relationship.

### 2.3.4 The school environment

One of the internal conditions/factors that could contribute to learners' poor academic examination performance is the school environment. The school environment includes such things as the classroom, teaching and learning resources, syllabus as the guiding educational document and the laboratory which of a necessity to the teaching of science subjects. It is believed that learners learn best in a conducive learning environment. Mosibudi (2012) states that a classroom environment that is not conductive to learning, will not yield good results. Aladejana and Aderibigbe (2007) acknowledge that:

> *"The classroom environment is more than just the physical space; it is the entire setting for learning. It encompasses the variety of tools and information resources, the interactions, the relationships between and among students and teachers, as well as the expectations and norms for learning and behaviour. Positive classroom environments are associated with a range of important outcomes for students." (p.501).*

The classroom should be a place where learners can get an education holistically and learn something. Wong and Fraser (1996) state that classroom-learning environment is an important determinant of learners' learning, thus, it should be conducive enough to promote learning. The tone of the classroom environment is set by the willingness of the teacher to give over some of their power and authority to the learners to allow them to freely participate and be actively involved in the teaching and learning process (Lang,

2001). Many experienced teachers do not allow themselves to lose control of class proceedings for learning still to take place in an efficeint manner.

One of the internal conditions at the school level are large class sizes which many teachers experience as a hindrance when teaching which is not a foreign phenomena to many schools in Africa. Marais (2016) confirms that it is challenging to give attention and motivate individual learners in an overcrowded classroom. Muyoyeta, Abah and Denuga (2017) concur by stating that in overcrowded classroom's learning is passive and learners tend to lose enthusiasm to learn. This means that teachers find it difficult to teach effectively in overcrowded classrooms, thereby contributing to poor learning due to lack of concentration during instructions . A large number of teachers tend to leave public schools due to high pupil to teacher ratio, in some schools and it leads to lower teachers' teaching effectiveness (David, 2014).

Aladejana and Aderibigbe (2007) state that

> *"The science laboratory environment is where the student develops the skills of observation, inquiry, accurate reporting, creativity, generalization and the need for safety and caution; all of these determine performance in science." (p. 504).*

The aforementioned skills are a necessity to be acquired for learners at their tertiary level of education to progress well. A large number of senior secondary schools have school laboratories but they do not have the laboratory facilities. Aladejana and

Aderibigbe (2007), David (2014) and Jackson (2009) emphasise that it is of great importance that the quality of laboratory environment is improved in order to enhance the academic performance of the learners.

It is also found that many teachers do not involve their learners into practical work due to lack of resources, apparatus and equipment (Nghipandulwa, 2011) which is promconducive environment to promote comprehensive skills that learners need to possess to perform well academically. David (2014) emphasises that:

> *"Practical in any learning experience involves students in activities such as observing, counting, measuring, experimenting, recording, observation and carrying out field work. These activities are totally different from the theoretical work which involves listening to talks and taking down notes from such talks…" (p.32).*

It is, therefore, crucial that learners are actively involved hands-on activities in their learning science to gain a meaningful understanding of scientific concepts. Biology as a science seem to be taught and learned better through hands on activities and words alone seem not to be enough to explain scienctific concepts to learners in capturing and grasping a meaningful understanding of science concepts.

In general, teaching resources are some of the instructional support that should available in schools to assist teachers and learners. Issues related to lack of resources have been reported to be a challenge in many schools in different countries. Lebata and Mudau

(2014) state that functional schools are expected to have physical resources such as equipped science laboratory and library. The lack of resources may contribute directly or indirectly to poor academic performance. Aschbacher, Ing, and Tsai (2013) point out that fewer resources yields negative school science experiences, which leads to many learners thinking that science is "too hard, uninteresting, and irrelevant" (p. 47).

Rammala (2009) conveys that the availability of resources at home also seems to contribute to learners' academic performance. Learners who have exposure to resources, e.g. internet are more informed about the latest scientific developments, thus assisting them to learn science in a better manner (Lebata & Mudau, 2014). Furthermore, states that "there is a strong relationship between learner performance and the quality of the facilities available to learners" (p. 23) to provide instructional support.

Generally, science school syllabuses are lengthy and time-consuming to cover (Lebata & Mudau, 2014). This has been proven to contribute negatively to the academic performance of the learners. Muyoyeta, et al., (2017) state that a limited lesson time (40 minutes per lesson) is allocated to Biology teaching timetable in Namibian schools and this makes it challenging for teachers to complete the long NSSCO syllabus.

### 2.4 Possible solutions to ameliorate the challenges

The following were some of the internal conditions mentioned that are thought to contribute to poor academic examination performance: internal conditions to teachers

(teacher qualification, teacher teaching experiences, teacher knowledge of the science content, teacher motivation and behaviour), to learners (behaviour, motivation, involvement into learning activities) and to the school environment (conduciveness of the teaching and learning environment, conduciveness of the laboratory, availability of teaching and learning resources) and subject syllabus is time-consuming.

Some strategies are suggested as based on the mentioned internal conditions/ factors and different internal processes supporting different instructions believed which are to affect learners' academic examination performance are reviewed in the literature below.

### 2.4.1 Internal conditions to teachers

The use of a variety of teaching methods is believed to most likely to accommodate various learners' individual learning styles. Nakanyala (2015) agrees that good teaching methods could be accomplished in classroom settings when teachers start employing the teaching methods which are more learner-centred. It teachers' responsibilities to keep the learners actively involved so that they may not get bored and start to fall asleep. Muraya & Kimamo (2011) concur by stating that when teaching the objective is to bring out desirable learning in learners and during this process, the learner is expected to obtain information, understand it and apply it later when the need arises in tests and examinations.

Lebata and Mudau (2014) are of the opinion that teacher-centred methods do not seem to produce good examination results and therefore this should prompt teachers to employ methods of teaching that will enable learners to acquire intended objectives instead of giving lot of work that will not allow learners to gain knowledge. It is also crucial to science teaching and learning that school as whole should ensure that the theoretical aspect of the science subjects must not be neglected since it is an integral part of the practical (Achor, Agogo & Orokpo, 2011). This is true although emphasis is put on how crucial practical work is important in Biology, hence the theory should not be neglected.

Teachers are the driving force during instruction and should encourage cooperative learning and peer teaching methods to boosts learners' self-esteem (Graziano, 2016). Lawrence (2009) in the same view concurs that "where there is an ethos of acceptance, and where teachers are able to be genuine and empathetic, there will be a self-esteem enhancing ethos in their classroom" (p. 84).

Consistency in assessment of learners' and marking of their work timely, this might be troublesome for teachers with large class sizes. Lebata and Mudau, (2014) concur and advise that assessment should be used to find out if learning has transpired, and Biology teachers should choose assessmemt methods which will enable them to ascertain the status of learners in the learning process in order to find ways of helping their struggling learners. The way in which assessment is conducted can also hamper teaching and

learning process, therefore an improvement in the way it is carried out may be a step in the right direction.

### 2.4.2 Internal conditions to learners

Cooperative learning strategies are known to be crucial in helping learners understand the science content. In cooperative learning classrooms, learners work together to ensure the success of each and every learner, which is a positive interdependence which teach learners that school life for all of them is enhanced when they all succeed (Muraya & Kimamo, 2011). Haimbodi (2012) affirms that cooperative learning boosts learner's academic achievement because they learn by interacting with one another and it develops their self-esteem. Teaching and learning methods that entails practical investigations and cooperative learning have a positive impact on learners' academic performance, in agreement Marx and Harris (2006) state that:

> *"Students acquire and deepen their understanding by integrating new information with prior knowledge and applying their new knowledge as they engage in investigations. Understanding is enhanced as students collaborate to plan and conduct investigations, collect and analyse data, and report and debate ideas and findings with their peers and teacher. As students participate in inquiry activities, they also learn about the nature of science, such as how questions are formulated and investigated, what counts as evidence, how scientists interpret and report results, and how ideas are advanced." (p. 469).*

Khoboli and O‟Toole (2011) propose that problem-based learning, practical work and group work tend to allow learners to work together and assist one another in order to understand the subject better. While Barker (2007) also states that some learners that have a great desire to learn by interacting with nature. Biology is one of the sceince courses that depend on the environment for learning. It actually becomes a quite an interesting course if teachers take learners egularly on educational tours, for example, to areas where it will assist them to learn the syllabus contents in relation to the natural environment to understand what they are learn in class as Allen (2014) states that:

> *"... when a student is actively engaged in fieldwork. They inevitably broaden their worldview, realize they can handle stressful situations, and gain valuable professional skills while simultaneously enhancing their ability to understand their place - not just in science, but the world at large." (p. 10).*

David (2014) states that in order to sustain and stimulate the attention of learners in practical work classes, teachers should effectively involve to transfer science content knowledge and facts to learners to enable them to performance in examinations.

Hollins (2011) states that the teacher training have been criticized to be of weak pedagogy and to be fragmented. There is a great need for clearly stated processes on learning to teach and standards for quality teaching. Teacher training of a high standard is crucial, it gives teachers pride and their qualifications will not be doubted, the quality

of training they received will be revealed. It will allow them to engage the learners more in their education.

### 2.4.3 Internal conditions to the school environment

David (2014) emphasise that the success of any science course is much dependent on the laboratory provision made for it. Even though countries face economic crises, the quality of education should not be compromised. Mosibudi (2012) affirms that:

> *"schools serving economically disadvantaged neighbourhoods frequently have under qualified and under-paid teachers are under resourced and have overcrowded conditions. These schools also usually have higher teacher turnover rates and lower parental involvement." (p. 23).*

The statement above does not fully apply to our local schools as the governement is trying its best to give resources, although the teacher learner ratio in some schools is large.

## 2.5 Summary

This section provided a review of studies carried out in regard to the challenges affecting learners' academic performance during the teaching and learning process. Literature gathered reveals that teachers and learners are phased with a number of challenges that affect learner performance. It is also evident that a number of these challenges are out of the teacher or learners control but a number of them are. Teachers have an influence on

how learners' performance by motivating them positively and attitude displayed towards the subject. Generally, some of the challenges are resources, attitude of teachers and learners, teaching and learning methods. Apart from teachers' lack of continous professional development. Indeed, teachers face quite a number of difficulties such as limited skills to teach, insufficient resources, time and cultural differences.

The next chapter outlines the different methods and procedures that were followed in the process of collecting and analysing the data.

# CHAPTER THREE

# METHODOLOGY

## 3.1 Introduction

This chapter outlines the different methods and procedures that were followed in the process of collecting and analysing the data for this study. Therefore, this chapter deals with the research design, the population of the study, the sampling procedures, research instruments, data collection procedures, data analysis techniques and ethical considerations.

## 3.2 Research Design

This study used a mixed research design method, which employed both qualitative and quantitative research approaches. The quantitative approach was used structured survey design to obtain data on the challenges as faced by NSSCO Biology teachers and learners which affect learners' academic examination performance in Biology Grade 12 NSSCO assessment.

The qualitative approach was used to collect data on the views of the participants on the possible solutions that could be applied to overcome the challenges as well as further information on the teachers' and learners' challenges that may not be clear in the structured-survey design. The qualitative approach was also used to obtain further

information on the learner-teacher challenges that may not have been covered in the quantitative survey design. Combining the elements of qualitative and quantitative research approaches gave significant explanations of data for it to be understood more clearly. Tashakokori and Teddie (2010) as cited by Check and Schutt (2012) concurs by stating that mixing the two approaches in one study allows the researcher to use unique strengths of each methodological approach at different stages in the research process.

### 3.3 Population

The population comprised of a total of 582 Grade 12 learners in //Kharas educational region, of which 240 learners were males, while 342 were females. Hence, 198 out of 582 Grade 12 learners were doing NSSCO Biology in the //Kharas Region. On average, there was about 30 learners of NSSCO Biology level per school in the //Kharas Education region. In 2017 the //Kharas region had a total of 941 teachers, both primary and secondary schools, of which 659 were females and 282 were males. Hence, 12 out of 941 teachers were Biology teachers in senior secondary schools in the //Kharas Education region. In total the //Kharas region has 56 schools (primary and secondary), of which nine are secondary schools (EMIS, 2017). The region was selected purposively due to a consistent poor academic performances of learners being recorded in NSSCO Biology examinations in 2012, 2013, 2014, 2015 and 2016 (MoE, 2012, 2013, 2014, 2015 and 2016).

### 3.4 Sample and Sampling procedure

A sample of seven out of nine senior secondary schools was selected purposively, because they had Biology as a subject in their schools and a consistent poor performance. The schools also offered the following subjects as presented in table 1 below.

Table 1: School subjects

| **School name** | **Subjects** |
|---|---|
| **School A** | Physical Science, Mathematics, English, Geography, Agriculture |
| **School B** | Physical Science, Mathematics, English, Geography, Afrikaans, |
| **School C** | Physical Science, Mathematics, English, Geography, Office Admin & Keyboarding Application |
| **School D** | Physical Science, Mathematics, English, Accounting, Afrikaans, |
| **School E** | Physical Science, Mathematics, English, Geography, Development Studies |
| **School F** | Physical Science, Mathematics, English, Development Studies, Afrikaans, |
| **School G** | Physical Science, Mathematics, English, Khoekhoegowab, Agriculture, |

All 12 Biology teachers in the seven senior secondary school teachers were purposively selected to complete the questionnaire because they taught the subject at Grade 12 level. School A and F, each only had one teacher for Biology, while others had 2 teachers.

| School name | Number of teachers |
|---|---|
| School A | 1 |
| School B | 2 |
| School C | 2 |
| School D | 2 |
| School E | 2 |
| School F | 1 |
| School G | 2 |
| Total | 12 |

After preliminary analysis of the questionnaire, the researcher used purposive sampling to select a sub-sample of seven teachers (consisting of 1 teacher from each school) to participate in the follow up interviews. The sub-sample was considered to be information-rich with respect to the possible solutions on how to overcome the challenges they experience in NSSCO Biology. Additionally, the following criteria were used in selecting these teachers:

- Biology Teachers who were willing to participate in the follow up interviews.
- Teachers who taught NSSCO Biology at Grade 12 at the time of data collection.
- Biology teachers who participated in completing the questionnaires of the study.

Out of 198 NSSCO Biology learners, a sample of 140 was randomly selected to complete the questionnaires, which comprised of 20 learners from each of the seven senior secondary schools.

After preliminary analysis of the questionnaire, the researcher used purposive sampling to select a sub-sample of 14 learners (consisting of 2 learners: a male and a female from each school) to participate in the follow up interviews. The sub-sample was considered to be information-rich with respect to the possible solutions on how to overcome the challenges they experience in NSSCO Biology. Additionally, the learners were selected because they had the following criteria:

- Biology learners who were willing to participate in the study.
- They were learners at secondary schools in the //Kharas region

- They were in Grade 12 doing NSSCO Biology as one of the subjects at school.

### 3.5 Research Instruments

The researcher used two types of research instruments for collecting data in this study, namely, questionnaires and interviews. All instruments were not piloted but were validated for content by the experts in the Biology field.

#### 3.5.1 Teachers' Questionnaire

The researcher used teachers' questionnaires. The questionnaires consisted of a set of 4-point Likert scaled questions (agree, strongly agree, disagree, strongly disagrees) to investigate the challenges faced by teachers in the teaching of NSSCO Biology respectively. The questionnaire had two sections appearing once: Section A: seeking participants' biographical information and Section B: containing closed ended questions dealing with challenges experienced by teachers respectively in NSSCO Biology in the //Kharas region.

The questionnaire was given to experts (education officers and lecturers) in the field of Biology to validate the content items and made corrections provided and the finalised the research instrument. The participants were requested to indicate either agree, strongly agree, disagree or strongly disagree with the given statements in the questionnaire. All the 12 NSSCO Biology teachers in the seven senior secondary schools had to complete teachers' questionnaires.

### 3.5.2 Leaners' Questionnaire

The researcher used learners' questionnaires. The questionnaires consisted of a set of 4-point Likert scaled questions (agree, strongly agree, disagree, strongly disagrees) to investigate the challenges faced by learners in the learning of NSSCO Biology respectively. The questionnaire had closed ended questions dealing with challenges experienced by learners respectively in NSSCO Biology in the //Kharas region.

The questionnaire was given to experts (education officers and lecturers) in the field of Biology to validate the content items and made corrections provided and the finalised the research instrument. The participants were requested to indicate either agree, strongly agree, disagree or strongly disagree with the given statements in the questionnaire. A simple random sampling method was used to select a sample of 140 learners comprising of 20 learners from each school to complete learners' questionnaires.

### 3.5.3 Interview

A standardized open-ended interview was used to collect qualitative data from the 7 NSSCO Biology teachers and the 14 learners. Standardized open-ended interview consisted of questions that all participants were asked in the same way and order which permitted comparison amongst the responses from participants and ease the analysis (Bui, 2014).

The interview guide was given to experts (education officers and lecturers) in the field of Biology to validate the content items and made corrections provided and the finalised the research instrument. The researcher used teachers' interview guide and learners' interview guide to get in-depth opinions of the NSSCO Biology teachers and learners respectively on the challenges and possible solutions on how to mitigate the challenges they experienced in NSSCO Biology in the //Kharas region. The researcher used an audio recorder during the interview sessions, after obtaining the consent of the participants. The interviews with learners were done after school as from 14:00; while teachers set time slots for the researcher to come interview them, which was mainly during free periods, break time and after school. The interviews were approximately 15-18 minutes long.

The audio recordings were transcribed in verbatim immediately after the interviews with teachers and learners and raw data were organised into themes according to the research questions. The data obtained from the questionnaires and interviews were triangulated.

### 3.6 Data collection procedures

The researcher obtained permissions to collect research data through ethical clearance and research permission letter was granted to collect data at schools. The researcher requested permission from the Permanent Secretary of the Ministry of Education, Arts and Culture, the Director of the //Kharas region (see appendices A, B, C, D and E), principal, teachers and learners to conduct the study.

The researcher went to schools to make an arrangement with the teachers and learners on the suitable time slots to administer the questionnaires to the participants. The questionnaires were completed and collected on the same day.

Follow up of one-to-one interview sessions were conducted with seven teachers and 12 learners to probe further on the challenges that the Biology teachers and learners experience and to get the participants' opinions on the possible solutions that could be applied to overcome the identified challenges.

### 3.7 Data Analysis

According to Johnson and Christensen (2014) analysis of data commences from a definite point which builds on towards broad-spectrum. The quantitative data generated from the scaled close-ended questionnaires were analysed using descriptive statistics. However, the qualitative data from the follow up interviews were analysed using the thematic analysis method in order to organise the participants' responses into the themes that emerged (Creswell, 2014). The researcher then presented the analysed data and themes according to the research objectives.

### 3.8 Ethical considerations

Firstly, the researcher obtained ethical clearance from the University of Namibia's Research Ethics Committee to proceed with the study. Secondly the researcher obtained permissions from the Permanent Secretary of the Ministry of Education, Arts and

Culture, Director of the //Kharas region and the schools principals to conduct the study. Furthermore, the researcher informed the participants about the purpose of the study and seek their consents to voluntarily participate in the study. To ensure confidentiality, the researcher used codes to represent the real names of the participants and their schools. Soft copy of the data is saved on a computer with a security code that is only known to the researcher while the hard copies are stored away in a locked cabinet and will be destroyed after the thesis has been evaluated.

### 3.9 Summary

This chapter focused on the research methodology used to collect data from participants. The research designs, design, the population, sample and sampling procedure, research instruments, data collection procedures, data analysis and ethical considerations were described and discussed. The chapter discusses how the questionnaire were used to collect data followed by interviews to get in-depth opinions of the NSSCO Biology teachers and learners respectively on the challenges (in support of questionnaire results) and possible solutions on how to mitigate the challenges. The next chapter outlines the results from the data that was collected and discussions of the data.

# CHAPTER FOUR

# RESULTS AND DISCUSSIONS

## 4.1 Introduction

This chapter presents the results and the findings of the study. The aim of the study was to investigate the challenges affecting Grade 12 learners' academic examination performance in NSSCO Biology in the //Kharas education region of Namibia. The results are presented according to the research questions as stated in Chapter One which guided the study:

1. What are the challenges faced by NSSCO Biology teachers affecting the learners' academic examination performance in Grade 12 NSSCO Biology in the //Kharas Region?
2. What are the challenges faced by Grade 12 NSSCO Biology learners affecting their academic examination performance in the //Kharas Region?
3. What do the NSSCO level Biology teachers perceive as possible solutions to overcome the challenges they experience?

The next section presents the results of the study, starting with the first research question as stated in Chapter One.

## 4.2 RESEARCH QUESTION ONE: CHALLENGES FACED BY TEACHERS IN TEACHING GRADE 12 NSSCO LEVEL BIOLOGY

A questionnaire was used to collect data from 12 NSSCO Biology teachers at seven selected schools in the //Kharas educational region in Namibia (see Appendix G & H). The following items of the questionnaire were used in gathering information from the participating teachers:

1. Sex
2. Highest Education Qualification and field of Specialisation
3. Number of years of teaching experience
4. Years of teaching experience at NSSCO Grade 12 Biology

The next section provides information about the above mentioned items of the questionnaire.

### 4.2.1 The Sex and number of participating schools and teachers

Starting with the first two items on the questionnaire, asking for the sex and number of the participating teachers. Altogether seven school sites (School A, School B, School C, School D, School E, School F and School G) were involved in the study with a total of 12 teachers of which eight were females and four were male teachers. The next section will deal with the qualifications of the participating teachers.

### 4.2.2 Highest Education Qualification and Fields of Specialisations

The Biology teachers who participated in this study had different academic qualifications as illustrated in Figure 1 below.

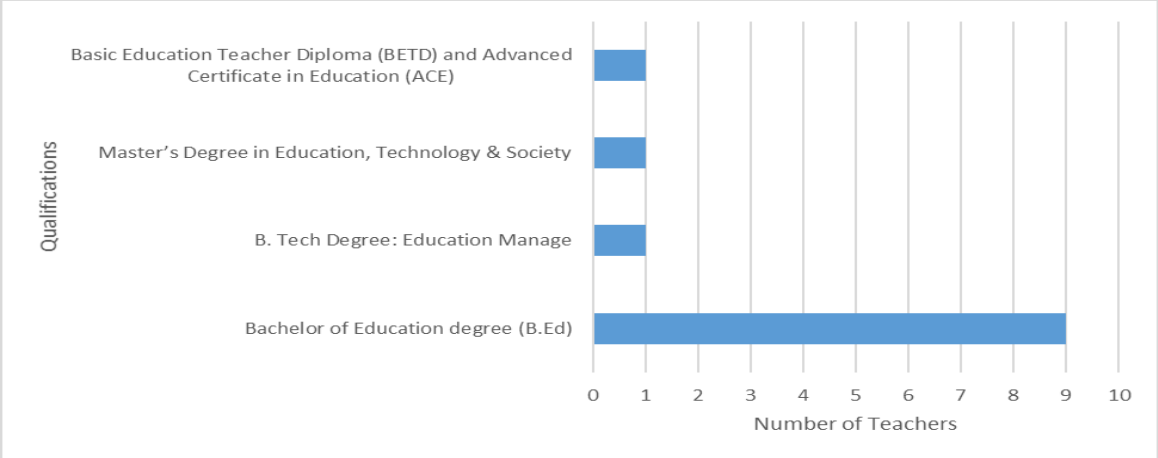


**Figure 1: Highest Qualifications of the Biology teachers**

Figure 1 shows that all teachers who participated in this study had teaching qualifications ranging from a Basic Education Teacher Diploma, Advanced Certificate in Education, Master Degree in Education, Technology & Society, Bachelor of Technology Degree (majoring in Management) to Bachelor of Education Degree Honours (majoring in Biology). The majority of the teachers (9/12) have a Bachelor Degree in Education (Hons) while the remaining three teachers have a Bachelor of Technology Degree (Education management), Master in Education, Technology & Society and Basic Education Teachers Diploma (BETD) plus Advance Certificate in Education (ACE) respectively.

A Basic Education Teacher Diploma, Advanced Certificate in Education, Master Degree in Education, Technology & Society, Bachelor of Technology Degree (majoring in Management) are not qualified to teach Biology at Senior Secondary School level. The Basic Education Teacher Diploma and Advanced Certificate in Education are training for Primary and/or Junior secondary school levels and they are underqualified to teach at Senior Secondary school levels. However, teachers with the Master Degree in Education, Technology & Society and Bachelor of Technology Degree (majoring in Management) are also not qualified to teach Biology as it is not one of their major subjects in the Namibian education system.

The next section deals with experiences of teachers teaching Biology at Senior Secondary school level.

### 4.2.3 Teachers' experiences in teaching Biology

Teachers were asked to indicate their teaching experience in terms of the number of years in answering items on the teacher questionnaire. The teaching experiences were grouped into various categories. The responses are summarised in Figure 2 below.

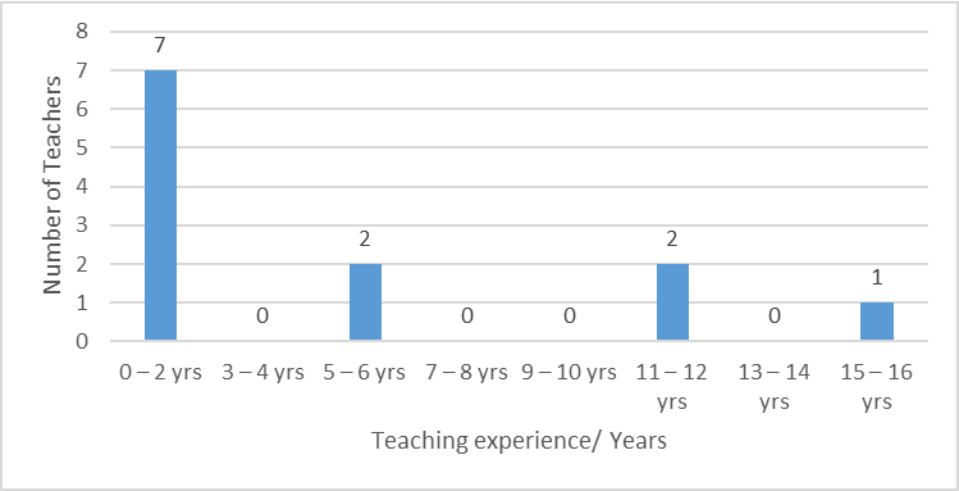


**Figure 2: Teachers' years of experience in teaching Biology**

Figure 2 above shows that seven teachers are in the range of zero to two years of teaching experience while two teachers have five to six years of experience in teaching, two teachers have 11 to 12 years of experience and one teacher has 15 to 16 years of experience in teaching Biology at secondary school. The majority of the teachers are having less experiences in the number of years teaching the subject. Thus, teacher experiences could be limiting the pedagogical content knowledge of the teachers and in turn limiting them to have a variety of pedagogical information on how to teach various Biology content topics.

The next presentation focuses on the second section of the teacher's questionnaire that included the item-questions as per Likert scale based on the following themes: the variety of teaching methods employed during instructions; the teachers' content knowledge of Biology; the teachers' pedagogical knowledge in teaching Biology; the Grade 12 NSSCO Biology curriculum; teachers' commitment towards teaching NSSCO

Biology, teacher-learner interactions during instructions and the teachers' support to learners.

The items on the questionnaire included statements that were answered according to the four-point Likert scale i.e., *agree, strongly agree, disagree, strongly disagrees* regarding the challenges that teachers experience in teaching grade 12 NSSCO level Biology. The next section starts with teaching methods as employed by the teachers.

### 4.2.4 Teaching methods employed by NSSCO level Biology teachers

In order to provide answers to this question, all 12 teachers completed a questionnaire and seven were interviewed. The next section focuses on information provided through the questionnaire, starting with the item about teaching methods.

#### *4.2.4.1 Information from teachers' questionnaires about teaching methods*

The teachers employed various teaching methods during the presentations of the Biology lessons focusing on the following statements: the use of lecture method; problem-based method; group work; discussion and practical based strategies of teaching. The Figure 3 below shows the results as presented in the questionnaire.

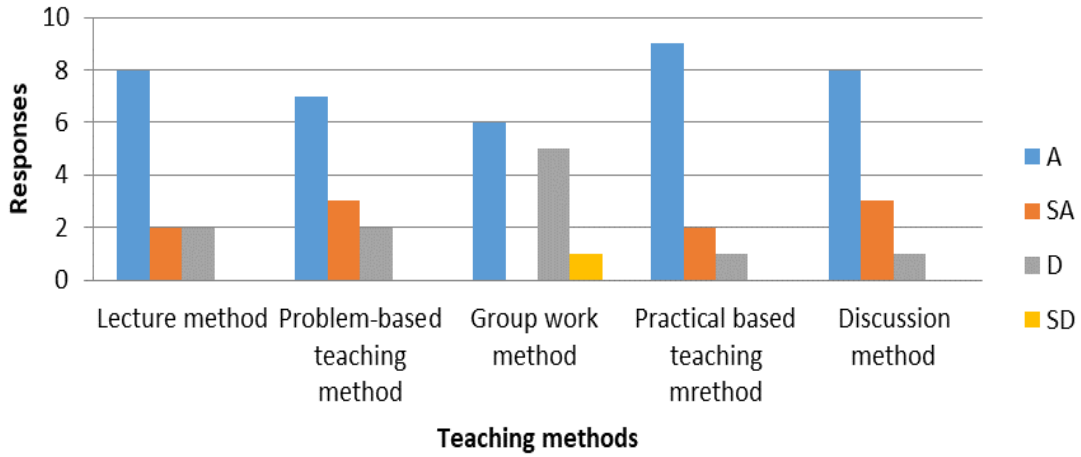


**Figure 3: Teaching methods employed by NSSCO Biology teachers**

Figure 3 shows that eight out of 12 teachers agreed and two teachers strongly agreed that they often used the lecture-method when teaching Biology. It was also found that eight of 12 teachers agreed and three teachers strongly agreed while one teachers disagreed that the discussion method is also used when teaching Biology. Figure 3 also shows that five of 12 teachers disagree while six of 12 teachers agreed with the statement that "I use group work method often". It also shows that nine of 12 teachers agreed on the use of the practical based teaching method while two of 12 teachers strongly agrred and one teachers disagreed with the statement. From the presentation of results, one can deduce that the majority of teachers are aware of the teaching methods that need to be used during the Biology instructions. But this in itself does not say that they are using these strategies during their instructions.

One can link the qualification of the teachers to the knowledge they gained through training. The majority of the participating teachers seem to have appropriate training

(Bachelor of Education Degree Honours) to teach Biology at secondary school level and might be possibly using the gained knowledge from their training in their teaching. However, one will wonder why learners are academically performing poor if the teachers are having appropriate teaching qualifications. Teachers might be agreeing with the statements of using the various teaching methods but in reality they might not be employing these teaching methods during instructions due to lack of pedagogical content knowledge as explained by Aladejana & Aderibigbe (2007). This phenomena is well illustrated by the information received from learners when they were asked which teaching methods their teachers employed during instruction. The Figure 4 below shows the information received from learners questionnaire.

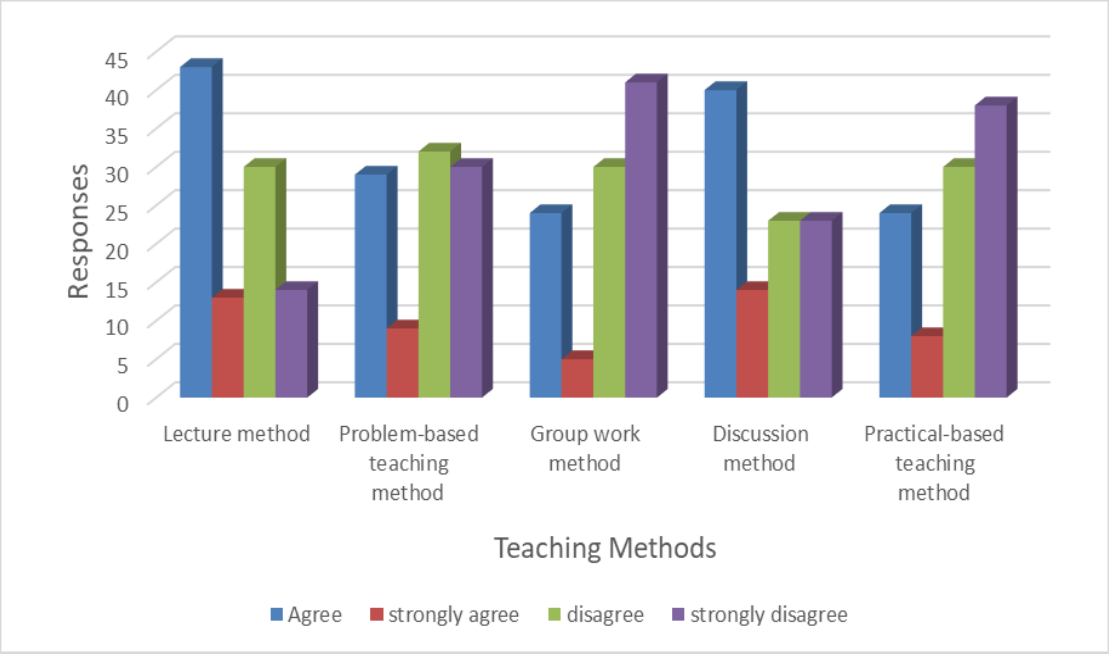


**Figure 4: Teaching methods employed by teachers as observed by learners**

Figure 4 shows the majority of the learners agreed that teachers used mainly lecture methods and discussion methods followed by the problem-based teaching methods while they strongly disagree that teachers use practical-based teaching methods and group work methods. The next section deals with information received through interviews with teachers.

#### *4.2.4.2 Information from teachers' interviews*

The interviews with the teachers provided a wider explanation on the way how the teachers practiced the various teaching methods during instruction. A total of seven teachers were involved in direct one to one interviews with the researcher. The interview items were as follows:

a) How often do you use the following methods in your teaching?
i) Group work
ii) Problem-based learning
iii) Practical work

b) In your opinion, why you use these mentioned teaching methods in your teaching?

c) What other teaching methods seem to be good to teach NSSCO Biology?

d) In your opinion, what are the factors affecting the use of these mentioned teaching methods?

The following are information received from teachers through interviews that could provide more information on how teachers seem to be using the mentioned teaching methods. When teachers were asked how often, seldom or never they used the mentioned teaching methods, their answers were as follows: Four out of seven teachers

interviewed indicated that they were using group work often, five out of seven teachers indicated that they were using the problem-based teaching method often and six out of seven teachers indicated that they were using practical work seldom. This means that the majority of teachers hardly employed the practical-based method during instruction, hence contradicting the information provided in the questionnaire indicating agreement to have been using problem-based and practical-based teaching as opposed to group work teaching. Thus, the majority seem not to involve learners in conducting practical work. The alternative to practical examination paper contributes 30% of the total mark. Learners are expected to be engaged in practical work often for them to perform well in the examination. Hence, a lack of proper engagement of learners into practical-based activities might lead to learners' poor academic examination performance.

The next item on the interview guide was about providing reasons as to why teachers were using the mentioned teaching methods. When teachers were asked why they were using the mentioned methods, they said, for example:

Teacher C said:

*I am using group work, to promote interrelation between the learners and it improves their results. So, we just don't carry out any practical work.*

Another teacher E said:

*I am using group work allows the learners to share their opinions. So, I allow them to do the discussions and then present after, it makes the slow learners to understand better.*

And teacher D said:

*We do not have all the necessary materials for practical work in the school and sometimes, we have to go to the Teachers' Resource Centre [TRC] which at times also don't have those material. So, we do nothing and the school cannot buy the items because they have to be provided from Medical Laboratory [medlab] or somewhere else.*

The information from the above interview extracts seem to show that the teachers were using group work method more often rather than the practical-based and problem-based teaching methods, as indicated earlier as per the teachers' questionnaire about the uses of the teaching methods. The next item on the interview guide was about other teaching methods that seemed to be good in teaching Biology. When teachers were asked which teaching method seem to be good in teaching Biology, none of the teachers provided an explanation as to why the methods they selected to teach Biology were good. It seemed they were using any teaching whether having advantages or disadvantages to the teaching of Biology. The majority of the teachers rather focused on the uses of Information, Communication and Technology (ICT) rather than describing why they have chosen to use specific teaching methods in teaching Biology. Teachers spoke about

the need for ICT resources rather than providing answers as to why they have chosen to use those methods for teaching Biology content. For example, *Teacher D said:*

*Sometimes, you ask a learner to present a certain topic when a problem arise and I have to re-emphasise it, for them to understand. We also use projectors but it is just confined to the computer lab.*

And Teacher E said:

*Teaching Aids especially the overhead projector, some learners understand the content better if they see.*

The next presentation is focusing on the factors affecting the uses of the mentioned teaching methods when teaching Biology. Teachers were asked to provide information about factors affecting them when using the mentioned teaching methods (problem-based teaching method, practical work and group work method). Teachers responded as follows:

Teacher B said:

*We don't have enough equipment like chemicals and apparatus and mostly, we only get them at the end of the year when we have to use them for Higher level practical exam.*

Another Teacher D said*:*

*We do not have all the necessary materials for practical work in the school and sometimes, we have to go to the Teachers' Resource Centre [TRC] which at times also don't have those material.*

And Teacher F said:

*I use group work seldom, it takes up too much time and the outcome is not so worth it. Group work is affected by time and also classroom management, it is very difficult to manage the learners, they become very noisy and also the fact that there are some learners that will be just seated there waiting for the gifted/smart ones to do something.*

The information from the above interview extracts indicated the following to be the factors affecting their teaching: Managing learners, less participation from learners, time management, lack of necessary materials for practical work, less equipped TRC, not enough equipment like chemicals and apparatus and lack of school laboratory.

The majority of the participating teachers have only a minimum of two years experience and this could be a contributing factor due to lack of pedagogical knowledge of knowing how to teach as part of ther internal processes as propositions aspoused by Ragan, Smith and Curda (2008). Thus, the observations of poor academic examination performance from the sight of the learners. Practical work in science is crucial and the teachers are suppose to employ the practical-based, group work as well problem-based strategies in

teaching as these will promote learners practical skills and allow them to learn from one another (Agashe, 2004).

The next section focuses on the teachers's content knowledge.

### 4.2.5 Teachers' content knowledge of NSSCO Biology

It is crucial for teachers to acquire appropriate science content if they have to teach that content. Learning about science requires teachers to have good understanding of science content. Figure 5 below shows the responses of Biology teachers about their views on their content knowledge. The teachers were asked to choose from agree, strongly agree, disagree and strongly disagrees about the various statements about their content knowledge of the NSSCO Biology.

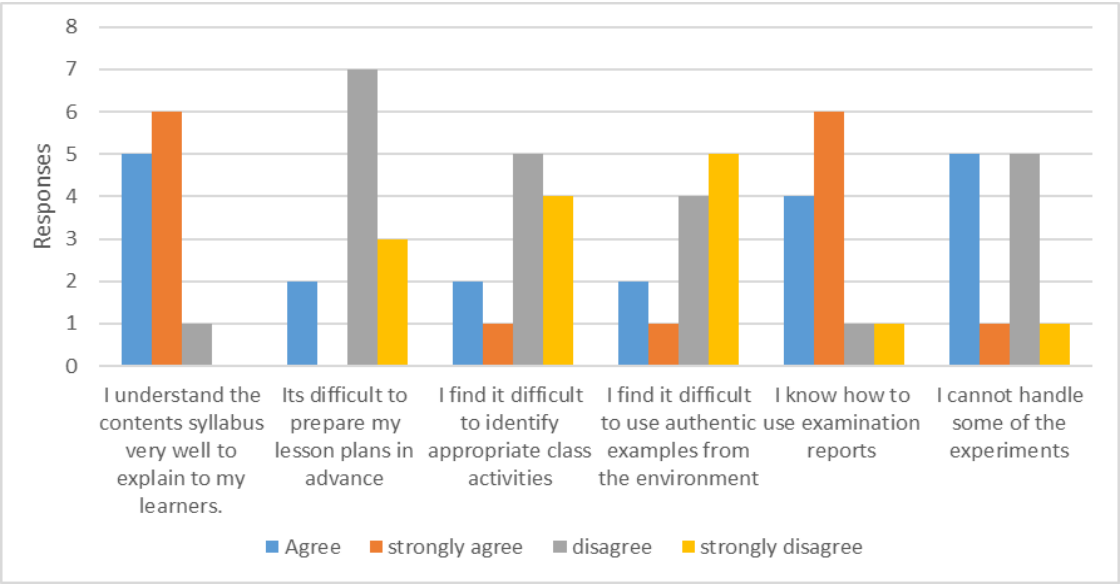


**Figure 5**: **Teachers' content knowledge of NSSCO Biology**

Figure 5 indicates that the majority of the teachers six of 12 strongly agreed while five agreed with the statement that they understand the contents of NSSCO Biology very well to explain them to their learners leaving only one teacher who disagree to knowing the content very well. It also shows that the majority of the teachers do not have any difficulties in preparing lessons in advance and that they do not experience problems in identifying appropriate class activities, authentic examples from the environment in teaching Biology. Moreover, when presented with the statement, "I know how to use examination reports in my teaching of Biology content", the majority of the teachers (6/12) strongly agreed and 4/12 teachers agreed that they know how to use the examination report to help their learners understand how to handle examinations questions. However, with regard to handling some of the experiments, five teachers

agreed and one teacher strongly agreed and five disagreed while one teacher strongly disagreed with the statement.

It is observed the majority of the participating teachers did not indicate their weakness in teaching the Biology content. However, one observed difficulty was found to be handling experiments although they indicated not to have difficulties with content of the syllabus. This is contradicting their views of not having difficulties with syllabus content as emphasised by Aladejana and Aderibigbe (2007), David (2014) and Jackson (2009) that it is of great importance to improve the quality of experiments in the laboratory to enhance the academic performance of the learners.

The next section will deal with pedagogical knowledge of teachers.

### 4.2.6 Teachers' pedagogical knowledge of Grade 12 NSSCO Biology

Pedagogical content knowledge involves the know how to teach subject content. Many teachers develop pedagogical content knowledge when they are involved in teaching. Pedagogical content knowledge increase as the teaching experiences of the teacher increase, that is, thus linked to teachers' experiences in teaching certain subject content. The Figure 6 below describes some teacher experiences in teaching subject content in various ways.

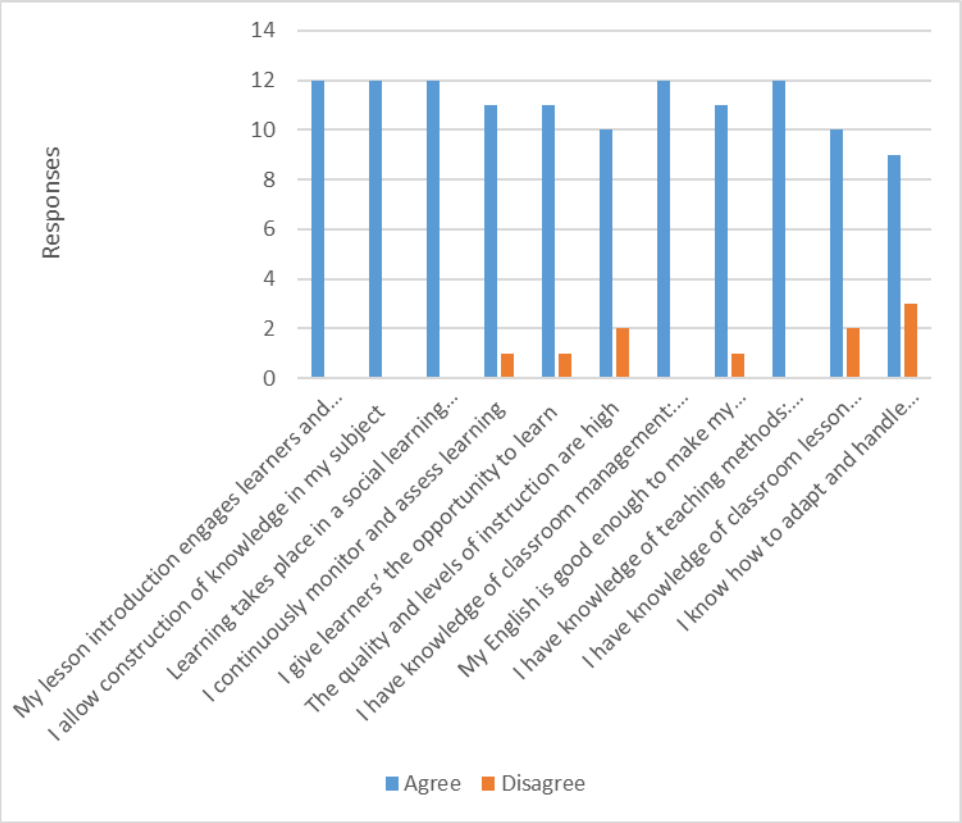


**Figure 6: Teachers' pedagogical knowledge of NSSCO Biology**

The Figure 6 was analysed by combining the strongly agree and agree as indicating agreement while strongly disagree and disagree will be combined as disagreement. It shows that the majority of the teachers agreed with most of the statements within the range of nine to twelve tallies of the participating teachers while one or two teachers disagreed with the statements such as to continuously monitoring and assessing learning; providing learners with opportunities to learn; the qualities of instructions to be high; language of instruction to be appropriate during instructions; to have knowledge of classroom assessment and knowing how to adapt and heterogeneous learning groups.

The pedagogical content knowledge of the participating teachers seems to be questionable as the majority have less than two years of experience in teaching Biology. It is questionable if pedagogical content knowledge in teaching science content could be developed within a short period of time such two years of being in teaching profession. Still with good command of pedagogical content knowledge in science content, learners are still academically performing poorly. Thus, there is room for further study in this area.

The next section presents and discusses results about the commitment of teachers in teaching Biology.

### 4.2.7 Teachers' commitments towards teaching NSSCO Biology

One of items on the teachers' questionnaire deals with the commitment of teachers towards teaching Biology in terms of punctuality, provision of class activities and tests, marking learners work and providing feedback on time, teaching the syllabus in a given time and revising subject content with learner. The items on the questionnaire included statements that were answered according to the four-point Likert scale i.e., *agree, strongly agree, disagree, strongly disagrees* regarding the commitment of teachers in teaching Biology. Figure 7 below indicates the commitment of teachers towards teaching Biology.

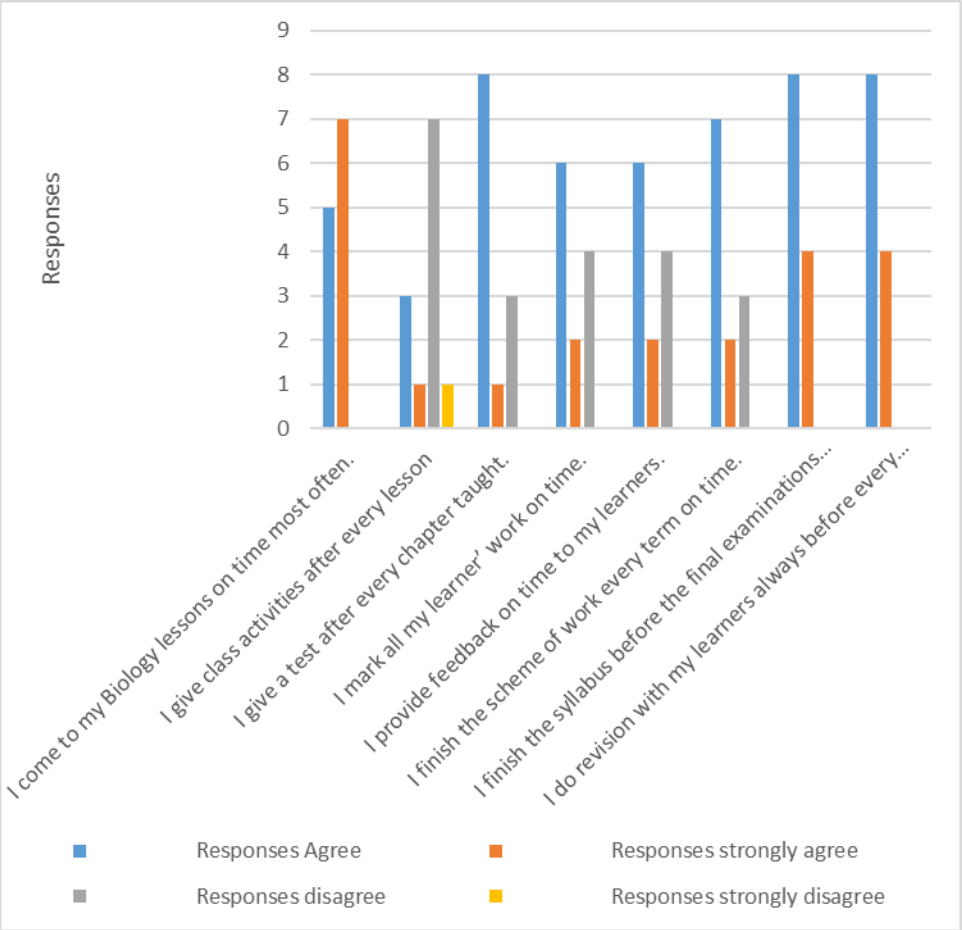


**Figure 7: Teachers' commitments towards teaching NSSCO Biology**

Figure 7 shows that majority of the participating teachers are in agreement in attending lessons on time (7/12 teachers), finishing the syllabus before examination (8/12 teachers) and doing revision with their learners before every final examination (8/12 teachers). However, the Figure 7 also indicates that few teachers (4/12 teachers) were in disagreement with finishing the syllabus in time, marking learners' work in time and providing feedback in time to learners while some teachers (3/12 teachers) were in disagreement in completing the scheme of work on time. The Figure 7 shows that majority of the teachers are in disagreement with the statement that they give class

activities or homework regularly (8/12 teachers). The Figure 7 shows that majority of the teachers (8/12 teachers) are in agreement that they gave tests after every chapter taught and marked all their learners' work in time.

One of the observed difficulties is to avoid giving class activities or homework to learners that shows less commitment from the side of the teachers. Figure 8 below shows responses from learners about the commitment of their teachers towards teaching Biology.

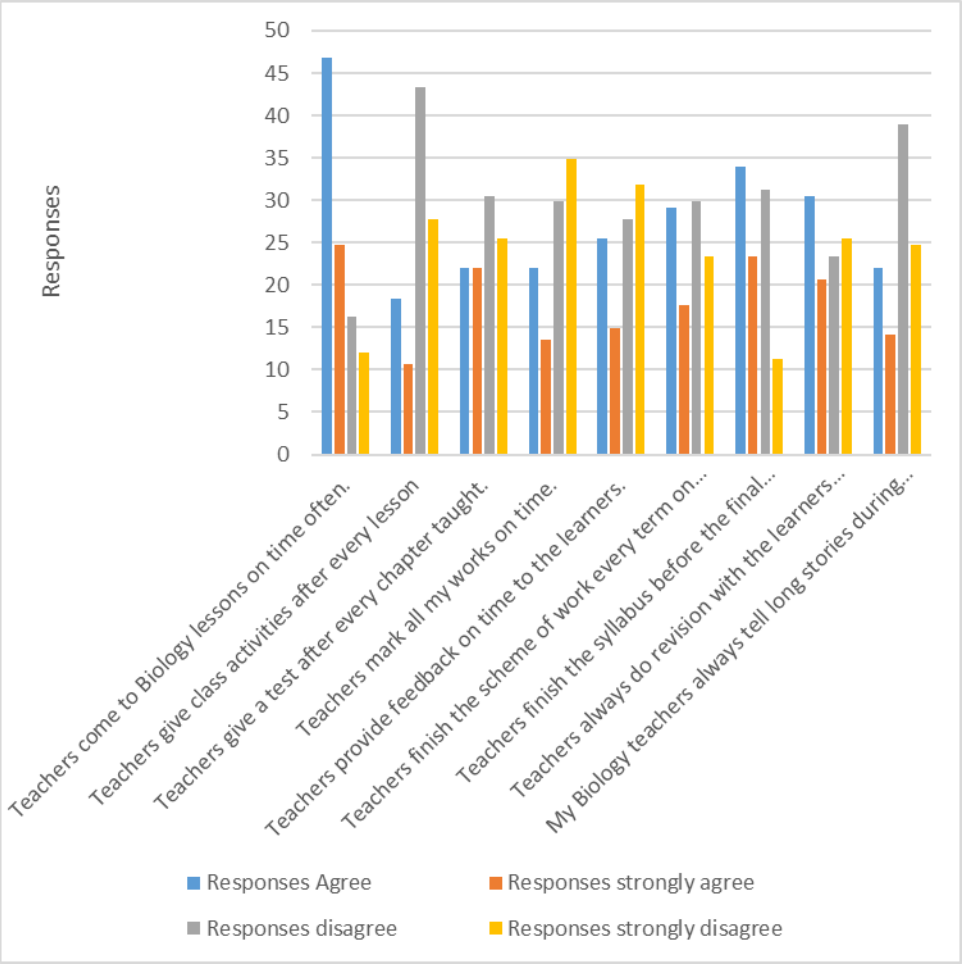


**Figure 8: Learners' responses on teachers' commitment towards Biology**

Figure 8 shows that majority of the learners are in disagreement the statements that teachers give class activities, tests, marking learners work, giving feedback on time, completing the scheme of work and syllabus on time. Thus, the information provided by learners is greatly contradicting the information provided by teachers. It is of great importance that teachers provide activities to learners to enhance learners' learning. Without teachers' commitment to assist learners to effectively learn, learners will tend to perform academically poorly in examinations as espoused by Hollins (2011) that quality education can be achieved when teachers are prepared and committed to prepare learners for examinations, thus, promoting good academic performance.

The next section deals with how teachers support their learners in assuring good academic performance.

### 4.2.8 Teachers' supporting learners

One of items on the teachers' questionnaire deals with the support provided to learners by teachers. The items on the questionnaire included statements that were answered according to the four-point Likert scale i.e., *agree, strongly agree, disagree, strongly disagrees* regarding the support given to learners by teachers. Figure 9 shows the support given to learners by teachers. The Figure 9 was analysed by combining the strongly agree and agree as indicating agreement while strongly disagree and disagree will be combined as disagreement.

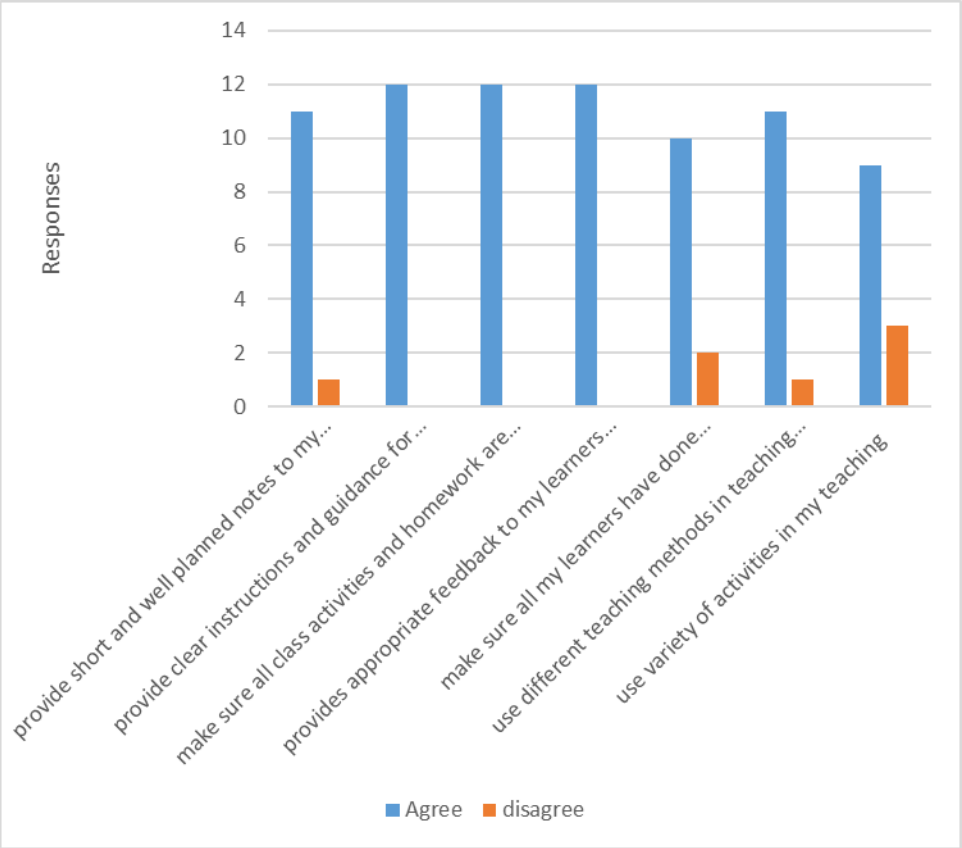


**Figure 9: Support provided to learners by teachers**

Figure 9 shows that generally the majority of the teachers are in agreement that they provide assistance in the form of giving short and well planned notes (11/12 teachers), providing clear instructions and guidance for activities and homework (12/12 teachers), make sure all activities and homework are supporting the development of basic competencies (12/12 teachers), giving appropriate feedback both orally and written (12/12 teachers), make sure that corrections and mistakes are done (10/12 teachers), using different teaching methods (11/12 teachers), and providing a variety of activities during instruction (9/12 teachers) while some teachers were in disagreement about providing short and well planned notes (1/12 teachers), make sure all activities and

homework are supporting the development of basic competencies (2/12 teachers), using different teaching methods (1/12 teachers), and providing a variety of activities during instruction (3/12 teachers).

Generally, the majority of the teachers are saying that they provide assistance, but learners are still academically performing poorly. Although Hollins (2011) state that "… t*eaching is a complex and multidimensional process that requires deep knowledge and understanding in a wide range of areas and the ability to synthesize, integrate, and apply this knowledge in different situations, under varying conditions…." (p. 395),* learners might not benefit from the support provided by teachers due to the complexity of the teaching and learning environment. Hence, provision of teacher support might not produce positive, good academic performance due to other factors that might influence the internal conditions and internal processes within the teachers, learners and the school environment at large.

The next section presents and discusses information about the school curriculum (Biology syllabus).

### 4.2.9 NSSCO Biology Curriculum (syllabus)

One of items on the teachers' questionnaire deals with the NSSCO Biology curriculum (syllabus). Curriculum mainly entails the syllabus that should be completed in a certain period of time to allow learners to be assessed on the attainment of the curriculum content. The items on the questionnaire included statements that were answered according to the four-point Likert scale i.e., *agree, strongly agree, disagree, strongly disagrees* regarding the NSSCO Biology curriculum (syllabus). The Figure 10 was analysed by combining the strongly agree and agree as indicating agreement while strongly disagree and disagree will be combined as disagreement. Figure 10 below shows the Biology curriculum (syllabus).

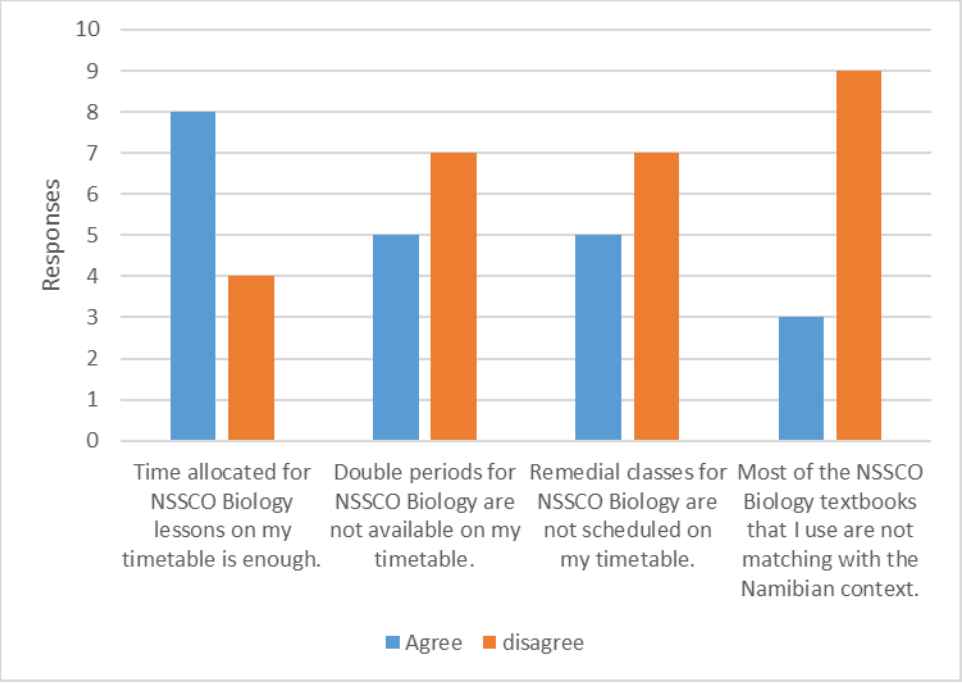


**Figure 10: The Biology curriculum (syllabus)**

Figure 10 shows that majority of teachers (8/12 teachers) are in agreement with time allocated for Biology on the timetable statement while majority of the teachers are found to be in disagreement with double periods not located on the timetable (7/12 teachers), remedial classes not scheduled on the timetable (7/12 teachers), and textbooks not matching the Namibian context (9/12 teachers).

The time allocation to completing the syllabus seems not to be one of the challenges facing teachers that affect learners' academic examination performance. However, teachers seem to be faced with challenges with availability of double periods for conduct practical work, availability of enough time for remedial classes and contextualised Biology content as espoused by Muyoyeta, et al., (2017) that with limited lesson time learners may not be able to be engaged in discussions for better understanding.

The next section deals with the availability of resources for the teaching of NSSCO level Biology.

### 4.2.10 Availability of resources for NSSCO Biology

In order to provide answers about the availability of resources as challenges facing teachers in teaching Biology, all 12 teachers completed a questionnaire and seven were

interviewed. The next section focuses on information provided through the questionnaire about the availability of resources.

### *4.2.10.1 Information from teachers' questionnaires about availability of resources*

The statements on the questionnaire included, adequacy of the teaching and learning materials, availability of Biology laboratories, availability of laboratory equipment and resources and availability of textbooks. The items on the questionnaire included statements that were answered according to the four-point Likert scale i.e., *agree, strongly agree, disagree, strongly disagrees* regards the availability of resources in teaching Biology. The Figure 11 was analysed by combining the strongly agree and agree as indicating agreement while strongly disagree and disagree will be combined as disagreement. Figure 11 below shows the availability of resources.

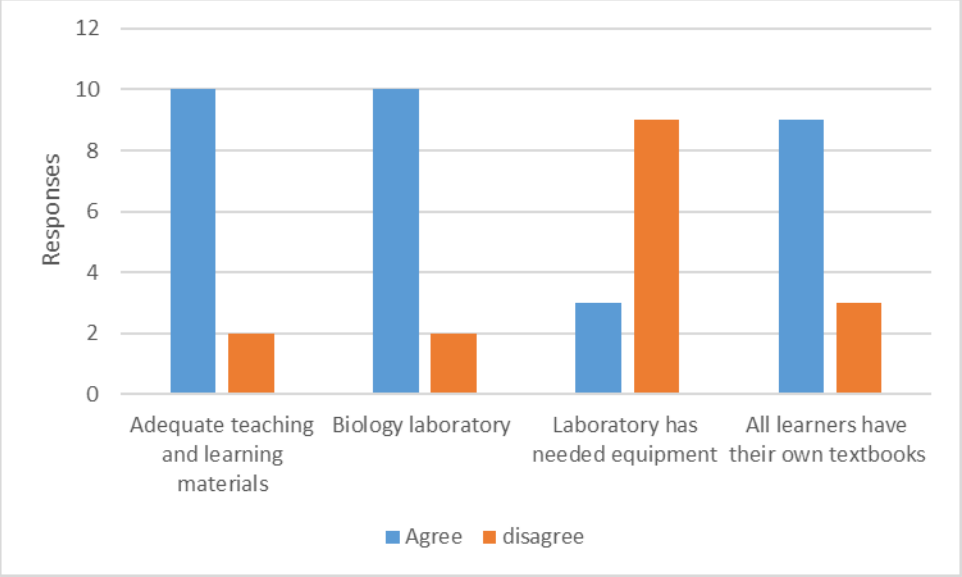


**Figure 11: Availability of NSSCO Biology resources**

Figure 11 shows that majority of the teachers are in agreement that resources such as textbooks and past exam papers are adequately available (10/12 teachers), availability of Biology laboratories (10/12 teachers), availability of laboratory equipment and resources e.g. chemicals, test tubes, measuring cylinders, etc. (3/12 teachers) and availability of textbooks (9/10 teachers) were learners are sharing textbooks while some teachers were in disagreement about availability of resources (2/12 teachers), availability of Biology laboratories (2/12 teachers), availability of laboratory equipment and resources (9/12 teachers) and availability of textbooks (3/12 teachers).

It seems that availability of the laboratory equipment and resources are but some of the challenges facing teachers, teaching NSSCO Biology in preparing learners to perform well academically, as espoused by Rammala (2009) that lack of resources at schools could be one of the contributing factors to learners' poor academic performance.

The interviews with the teachers provided a wider explanation as to whether teachers are using various resources in teaching NSSCO Biology or not. The section below is providing information as received from the teachers' interviews.

#### *4.2.10.2 Information from teachers' interviews about availability of resources*

The interviews with the teachers provided a wider explanation on the availability of resources at the school. A total of six teachers were involved in direct one to one

interviews with the researcher. Teachers were asked to provide answers to the following items on the interview research guide:

a) Do you use to finish your Grade 12 NSSCO Biology syllabus and scheme of work on time?
b) How frequent do you administer class activities to your learners and provide feedback?
c) How do you teach Grade 12 NSSCO Biology practical work to your learners in the laboratory with limited resources?

The following information was received from teachers through interviews and could provide more information on challenges that teachers faced about the availability of resources at the school. When teachers were asked if they completed Biology syllabus and scheme of work in time, they provided the following information, for example Teacher A said:

*No, I usually go the extra mile, by giving extra classes or sometimes I teach over the weekends to finish the syllabus.*

And Teacher D said*:*

*Yes, I am able to finish my syllabus on time, because I teach afternoon classes and Saturday classes. I also do presentations especially the last topics, it is easy to present them because they are related to Geography and Development studies.*

Yet another teacher G said:

*No, because the content is too much and it requires more attention for learners to get the best. The time frame is also very short, if you rush to finish, then yes, you will finish.*

*And* Teacher C said:

*Yes, I do finish, like currently I'm done and we are busy with revision due to the reason that the subject in the timetable was efficiently allocated.*

The information provided by teachers through interviews seems to reveal that the teachers are faced with difficulties of completing the syllabus in time. For example, the majority of teachers (4/6 teachers) revealed that they could not finish the syllabus in time while two of six teachers said that they could finish the syllabus in time. Those teachers who seem to finish the syllabus in time have arranged extra classes to complete the syllabus. Some teachers went to the extent of teaching on Saturday and having afternoon classes to finish the syllabus in time.

The next item of the interview was concerned with the provision of class activities and feedback to the learners. When teachers were asked if they give class activities and feedback to learners, they have the following to say:

Teacher A said:

*I always give learners at least two written activities per week, due to the number of learners which is huge, if I have to mark, I can't give homework each and every day. Sometimes, if I give homework every day, I have to use the peer marking method and I give feedback every time whether I mark myself or they peer-mark themselves.*

Another teacher E said:

*I don't give necessarily homework or classwork every day, I mostly do informal assessment but I will be far, skip a topic without assessing them. When we do classwork, we give feedback the same day.*

And teacher F said:

*I give classroom activities every day, but I give feedback sometimes because they don't even do the work and you feel like what's the use of giving feedback;*

The above information provided by teachers seem to reveal that some teachers do give class activities and feedback to learners, although they seem to be challenged to give activities everyday as well as marking activities and providing effective feedback. Some teachers seem to complain about big classes - overcrowded classrooms, in Namibian schools. However, the ratio of teacher - learner (1:30) seem to generally low. Thus, the teacher's complaint about overcrowded classroom seem not to be a valid challenge for not giving class activities and providing feedback to learners.

The next item of the interview was concerned with the provision of with the availability of laboratory resources in teaching Biology. When teachers were asked about the availability of laboratory resources, they provided the following information:

Teacher B said:

*I try to do the practical work in groups at least or maybe just one practical for a certain class but not really individual learner using a practical set up.*

Another teacher D said:

*In situation where we do not have the materials to use for that particular practical, I encourage the learners to just learn the theory, so that if it comes in examination, then they have to translate that theory into practice. So in the examination, they will be provided with the materials.*

And Teacher F said:

*Yes, they like it very much, they don't even want it to end when we are doing practicals but we don't do it more often because we don't have resources as well as a laboratory.*

The above information provided by teachers seem to reveal that some teachers (5/6 teachers) involve learners in conducting practical activities irrespective of availability limited resources at the school. Some teachers seem to experience a challenge with lack of resources and they only allow learners to carry out practical activities when resources are available. Some teachers also tried to improvise by using the locally available resources instead of not involving learner in practical work at all and they even reduce the number of practical activities to be conducted due to lack of resources.

It seems that availability of resources at schools in the //Kharas educational region are but some of the challenges facing teachers teaching NSSCO Biology in preparing learners for examination. Some teachers complained about big classes - overcrowded classrooms. Although Muyoyeta, et. al., (2017) is of the assumption that overcrowded classrooms could contribute to passive learning, the current results do not seem to concur with her findings as the ratio of teacher – learner seem not to support overcrowded classrooms in the current study. Some teachers seem to reduce the number of expected practical activities to be conducted due to lack of resources that may contribute to poor academic performance in the alternative to practical examination paper. Limited laboratory resources could hinder the quality of the teaching and learning process as espoused by Aladejana and Aderibigbe (2007), David (2014) and Jackson (2009) that the quality of laboratory environment could be a challenge to the academic performance of the learners.

The next section deals with the interaction between the teacher and learners in the Biology classroom.

### 4.2.11 Teachers-learner interactions in the classroom

In order to provide answers about the teacher-learner interactions in the classroom, all 12 teachers completed a questionnaire. The next section focuses on information provided through the questionnaire about the teacher-learner interactions. The items on the questionnaire included statements that were answered according to the four-point Likert scale i.e., *agree, strongly agree, disagree, strongly disagrees* regards the teacher-learner interactions. The Figure 12 was analysed by combining the strongly agree and agree as indicating agreement while strongly disagree and disagree will be combined as disagreement. Figure 12 below shows information about teacher-learner interactions in the classroom.

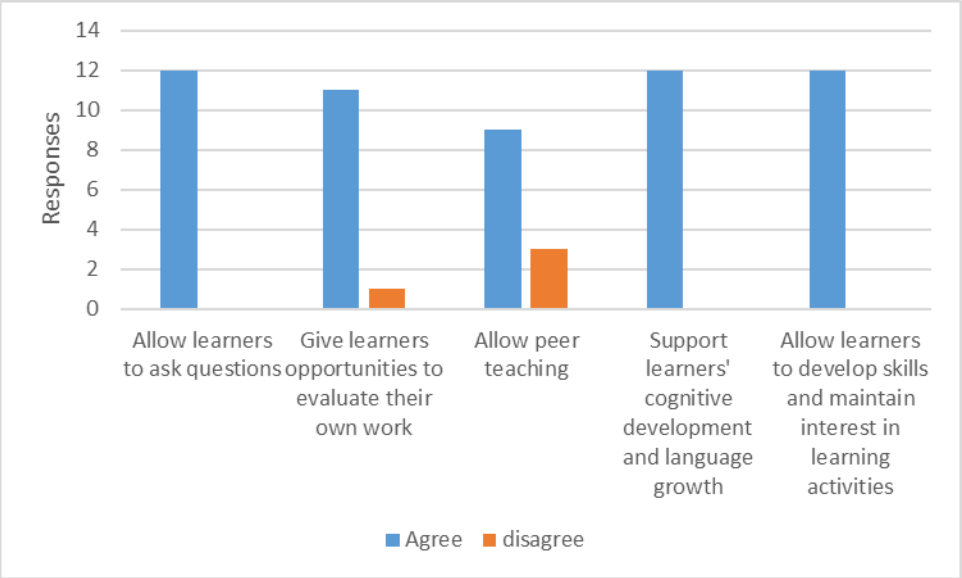


**Figure 12: Teacher-learner interactions in the classroom**

The majority of the participating teachers are in agreement in allowing learners to pose questions during instruction (12/12 teachers), to give opportunities to learners to evaluate their own work (11/12 teachers), to allow peer teaching (9/12 teachers), to support learners' cognitive development (12/12 teachers) and to allow learners to develop skills and maintain interest (12/12 teachers) while some teachers were in disagreement in giving opportunities to learners to evaluate their own work (1/12 teachers), and allowing peer teaching (3/12 teachers). It seems that teachers do not have challenges that could contribute to poor academic performance. Learning does not occur in isolation, it involves engagement with others. It allows one to learn from others.

Hundred and forty learners were also involved in completing a questionnaire in order to provide answers about the teacher-learner interactions. The next section focuses on

information provided by learners about teacher-learner interactions. The items on the questionnaire included statements that were similar to the teacher questionnaire and the four-point Likert scale was adapted to a to two-point Likert scale consisting of only two components i.e., *agree and disagree* with regards to the teacher-learner interactions. The Figure 13 below shows information about teacher-learner interactions in the classroom.

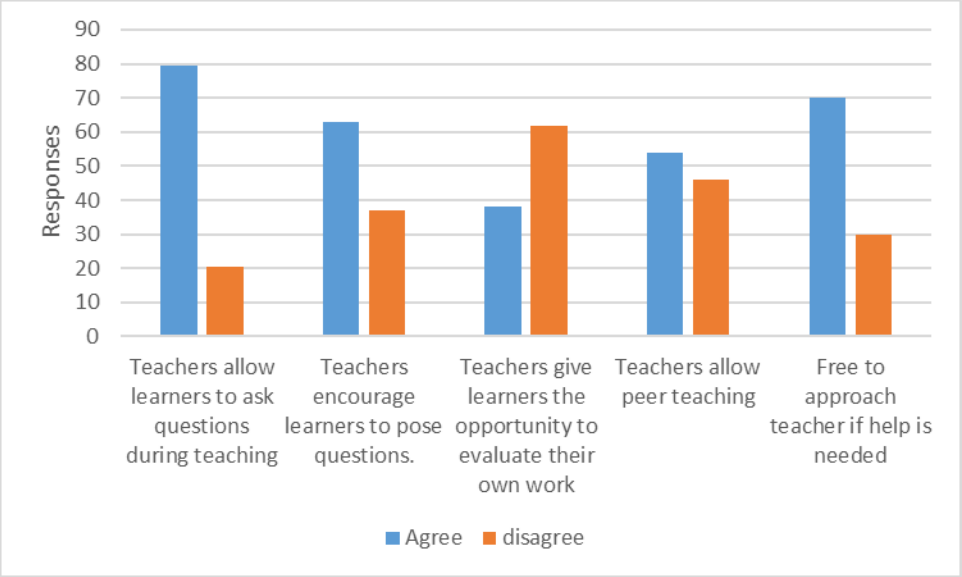


**Figure 13: Learners' response on their interaction with teachers in the classrooms**

Figure 13 reveals that majority of learners (79.5%) were in agreement that teachers allowed them to pose questions and encouraged them as well to pose questions (63.1%) and that they (learners) were free to approach the teacher if help was needed (70.2%), which in are line with what teachers provided in Figure 13 above. However, a considerable number of learners (61.7%) were in disagreement that teachers gave them opportunities to evaluate their own work which contradicts what the teachers provided in

Figure 13 above. The act of giving opportunities to learners to evaluate their own work is a way of surrounding some powers of the teacher to learner as espoused by Lang (2001) that teacher who give over some of their power and authority to the learners to allow them to freely participate and be actively involved in the teaching and learning process will enhance academic performance. However, the participating teachers seem to avoid providing such opportunities to their learners.

The next section presents the results of research question two, to outline the challenges facing NSSCO level Biology learners.

## 4.3 RESEARCH QUESTION TWO: CHALLENGES FACED BY GRADE 12 NSSCO BIOLOGY LEARNERS

### *4.3.1 Information from learners' questionnaires about attitudes towards Biology*

A questionnaire and interviews were used to collect information from 140 NSSCO Biology learners at seven selected schools in the //Kharas educational region in Namibia (see Appendix G to J). The items of the questionnaire were answered according to the two-point Likert scale i.e. Agree and Disagree and were asked to indicate their attitude towards Biology by agreeing and disagreeing about the given statements. The responses are summarised in the next section below.

#### *4.3.1.1 Learners' attitudes towards learning NSSCO Biology*

The learners were asked to indicate the extent to which they Agree or Disagree with each statement regarding the attitude towards NSSCO Biology. Figure 14 below shows information provided by learners on their attitude towards Biology.

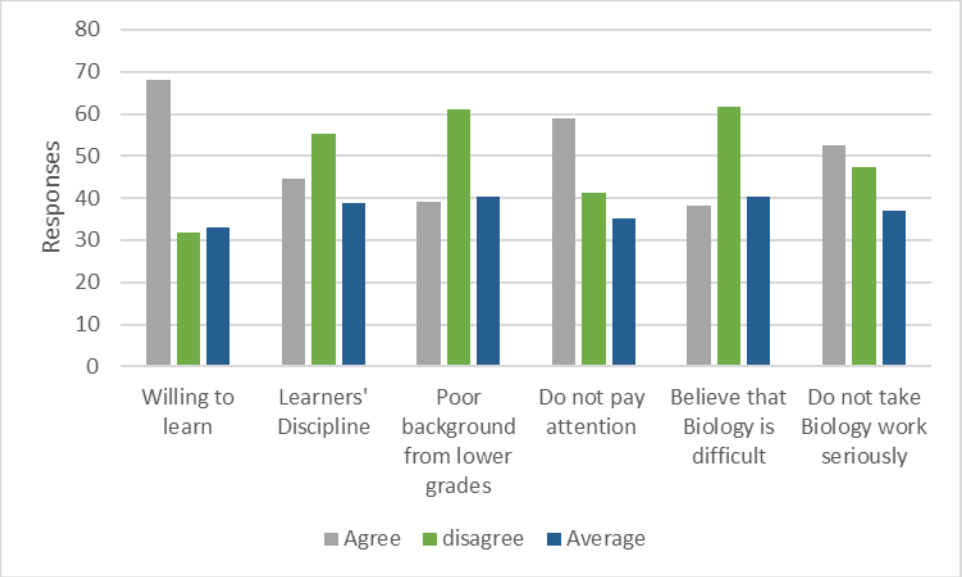


***Figure 14: Learners' attitude towards NSSCO Biology***

Figure 14 shows that most of the learners are in agreement that they are willing to learn (68.1% learners), they do not pay attention in the classroom (58.8% learners), and they do not take the subject seriously (52.5% learners). While some were in disagreement that they are discipline in class (55.3% learners), they seem to have poor Biology background knowledge (61.0%), and they also seem to believe that Biology is difficult (61.7%). The responses of the learners and teachers are in agreement in terms of the above mentioned aspects of attitude as described in Figure 15 below.

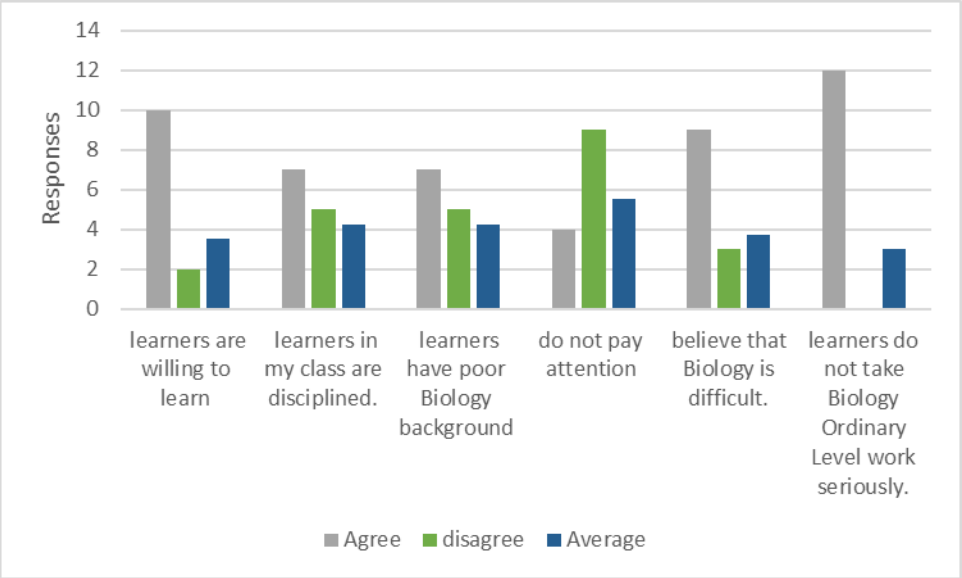


***Figure 15:*** **Teachers' responses on learners' attitude towards NSSCO Biology.**

It seems that the majority of learners are having various challenges (internal conditions) in learning Biology as termed in the theoretical framework by Ragan, Smith & Curda (2008). Internal conditions as alluded earlier includes the learners' attitude, ability to learn and learners' disciplinary behaviour that seem to impinge on learners' academic performance. This is agreement with what Ragan, Smith and Curda (2008) is suggesting that cognitive processes of retrieval of prior knowledge, encoding, and retrieval and transfer of new learning differs in nature, depending on the nature of the learning ability of various learners. Internal attitude as mentioned above seem to be challenges that should be considered as they contribute poor academic performance.

The next section provides more information from learners' interviews about attitudes towards Biology.

#### *4.3.1.2 Information from learners' interviews about attitudes towards Biology*

The interviews with the learners provided a wider explanation on the attitude towards Biology. A total of 14 learners were involved in direct one to one interviews with the researcher. Learners were asked to provide answers to the following items on the interview research guide:

a) Why do you think most of your classmates are not willing to learn Biology?
b) What would you comment on your classmates' disciplinary behaviour during Biology instructions?
c) Why do you think majority of the learners do not pay attention during instruction?

The following information was received from learners through interviews and could provide more information on the attitude of the learners towards Biology. When learners were asked about their willingness to learn Biology they provided the following information, for example, Learner A said:

*Our attitude towards Biology Ordinary level depends on the topic which we are doing. Some topics are not quite favourable or they are not quite entertaining to learn, but there are those that are interesting for example, the reproductive system, everybody wants to participate and want to learn but when you get to topics like the nitrogen cycle not quite….*

And Learner C said*:*

*No, the learners showed negative attitude. The way they are going on in the class, making noise and not showing interest when the teacher is presenting but only wait for the time when the teacher will make a pronunciation mistake, then they will laugh.*

Another Learner D said:

*Indeed, most of them are willing to learn, because they are forever busy, here and there they are asking questions, they going an extra mile and looking for extra information even though sometimes. Although, sometimes we are arranging afternoon classes, some of them don't come, instead they go to library and they also work out old question papers.*

Yet, another Learner F said:

*No, because they show lack of interest in the subject itself and they show as if they do not have energy for Biology. If there was a funnier way of learning Biology, they would have shown interest but right now they do not have interest at all.*

From the above interview extracts one can deduce that learners are faced with the following challenges: topics that are not interesting to learners, teaching methods that do not topics interesting to learners, learners who are misbehaving during instruction such as making noise while instructions are progressing and absconding extra pre-arranged

classes. The above-mentioned challenges concur with Lebata and Mudau (2014) that learners who disregard the work assigned to them and who show little interest in their school work tend to perform academically poor in examination. This phenomena is also alluded by Jackson (2009) that:

> *"…lack of learner discipline contributes to poor performance because some learners are ill disciplined, uncontrollable, and difficult to work with in class, some deliberately ignore instructions from teachers, while some leave the class during lessons, come to school late or disappear before school close." (p. 275)*

The next section deals with the socio-economic conditions of the learners.

### *4.3.2 Learners' socio-economic conditions*

In this study the socio-economic conditions include the life of learners. This includes the conditions at home and financial standing of the learners' parents. A questionnaire and interviews were used to collect information from 140 NSSCO Biology learners at seven selected schools in the //Kharas educational region in Namibia (see Appendix G to J). The items of the questionnaire were answered according to the two-point Likert scale i.e. Agree and Disagree and were asked to indicate their socio-economic conditions by agreeing and disagreeing about the given statements. The responses are summarised in Figure 16 below that presents the learners socio-economic conditions.

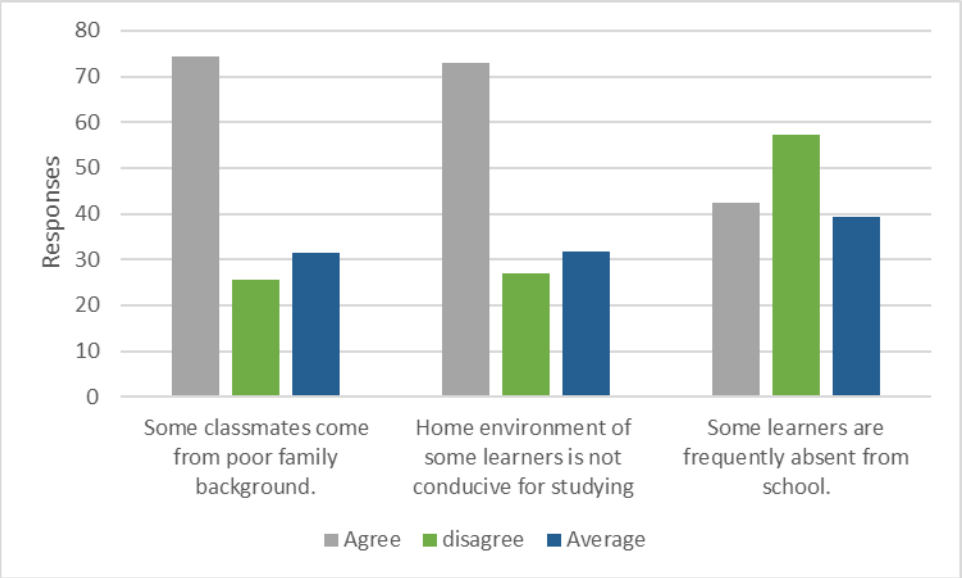


**Figure 16: Learners socio-economic conditions**

Figure 16 indicates that the majority are in agreement that learners are from poor families (74.4%) and that the home environment seem not to be conducive to learners for studying (73.1%) while some learners indicated their disagreement that they are frequently absent from school (57.4%). In addition to the questionnaire learners were also interviewed about factors that could affect their learning at home and school environments and have the following to say:

Learner A said:

*A number of learners look very tired after break they don't listen at all. Also, teenage pregnancy if we are at a topic on pregnancy and then there is a pregnant lady in the class, it makes the teacher to compromise a few things just to suit this girl because some*

*of the things will seem quite personal to that child. The school environment is conducive and it allows proper learning, we have enough chairs and tables.*

Another Learner B said:

*Learners are relaxed as they see that they are almost done with school. Friends here also play a big role, where if someone doesn't do this and that, they won't do it because my friend is not doing it, the learners just don't care anymore.*

Another Learner C said:

*Yes, like this year's world cup just finished and the condition at home sometimes, maybe there is no electricity or food. Some kids are hungry and they can't study on an empty stomach. At school its friends or peer pressure. The stressing level of the teachers sometimes is also very high.*

Another Learner E said:

*Some learners have less time at home because they spend time doing home chores and they don't study really.*

Another Learner F said:

*The home environment for a number of learners is not fine because they stay in the location close to bars and "shebeens" which make noise in the night. where they have to study, due to sport practice in the afternoon, they end up not studying because there is noise around them.*

While another Learner H said:

*The environmental factors, some learners face challenges at home maybe abuse, separation of parents which sometimes make them to be emotionally unstable, they tend not to contain themselves in classes or they can't concentrate. The school is noisy at times, the environment itself is not encouraging, its infrastructure, our Biology class has holes in the floor.*

And Learner K said:

*Maybe at the house, there could be domestic violence, alcohol abuse or lack of electricity.*

The responses of learners from the interviews indicated the following factors to contribute to learners learning poorly and in turn performing academically poor in examinations: domestic violence, alcohol abuse or lack of electricity at home; emotional unstableness of learners themselves (in particular, the pregnant girls); noisy school and home environment (*shebeens* in the vicinity); home chores; focusing on world cup

instead of studying; being hungry and studying on an empty stomach; peer pressure and too much relaxation as they think that they are about to finish school. The socio-economic conditions seem to contribute to poor learners' academic performance in addition to what Wong and Fraser (1996) alluded to in their study that conducive classroom or learning environment could impact or promote learning.

The next section deals with assistance learners receive from Biology teachers.

### 4.3.3 Assistance learners receive from Biology teachers

A questionnaire was used to collect information from 140 NSSCO Biology learners at seven selected schools in the //Kharas educational region in Namibia (see Appendix H & I). The items of the questionnaire were answered according to the two-point Likert scale i.e. Agree and Disagree and were asked to indicate assistance provided to learners by teachers by agreeing and disagreeing about the given statements. The responses are summarised in Figure 17 below that presents the type of assistance given to learners by Biology teachers.

Teachers' support to learners involves ensuring that the teaching aids that they receive is clear. Also, ensuring that feedback is provided to allow the learners to learn from past mistakes, when presented with similar questions in the examination. Figure 18 below shows learners' views on the support they receive from their teachers.

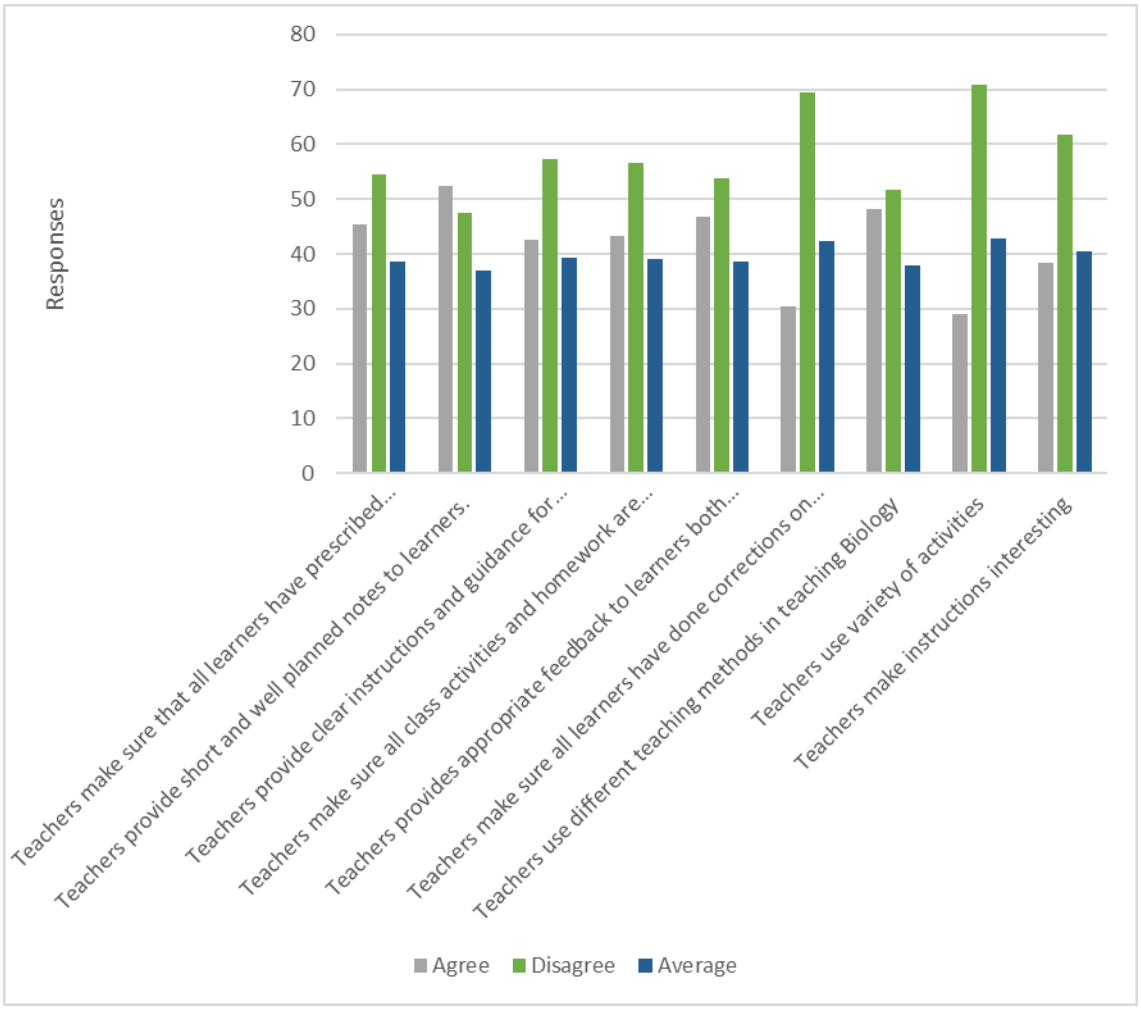


***Figure 17: Assistance learners receive from Biology teachers***

Figure 17 shows that the majority of learners (53.0%) were in agreement with the teachers about being provided with short and well planned notes as indicated in Figure 9 above. However, Figure 17 also indicates that the majority of learners are in disagreement with most of the responses provided by teachers (in Figure 17) about statements as mentioned in the questionnaire such as:

i. Teachers make sure that all learners have prescribed textbooks (55%),

ii. Teachers provide clear instructions and guidance for activities and homework (57%),
iii. Teachers make sure all class activities and homework are linked to basic competencies (57%),
iv. Teachers provides appropriate feedback to learners both orally and written (54%),
v. Teachers make sure all learners have done corrections on previous work (70%),
vi. Teachers use different teaching methods in teaching Biology (52%),
vii. Teachers use variety of activities (71%), and
viii. Teachers make instructions interesting (62%).

There is a gap for further study since the learners and teachers' responses are greatly contradicting about assistance provided to learners in promoting learning. There seems a party which is not providing correct information be learners or teachers that contributes to the above mentioned contradictions. The researcher wonders where the truth lies in how teachers provide assistance to learners to build upon and extend learners prior knowledge in facilitating the learners' ability to acquire, construct and creating new knowledge (Hollins, 2011).

The next section focuses on research question three.

## 4.4 RESEARCH QUESTION THREE: WHAT DO THE NSSC ORDINARY LEVEL BIOLOGY TEACHERS PERCEIVE AS POSSIBLE SOLUTIONS TO OVERCOME THE CHALLENGES THEY EXPERIENCE?

An interview guide was used to collect data from seven NSSCO Biology teachers at seven selected schools in the //Kharas educational region in Namibia (see Appendix I). The item on the interview guide was used in gathering information from the participating teachers about the strategies that could be implemented to improve learners' academic performance. For example, they provided the following suggestions:

Teacher A said:

*Learners' input is very little, I think we must start motivating these learners but I don't know what method we should use, we also need parents to engage with the learners' education, once that happens than at least we can corner them, because the teacher can do 60-70% of the work but if the learner did not learn while the teacher was teaching and also did not do extra work, then it will still come down. The parents must come on board.*

Another Teacher B said:

*We had spring school which was helping a bit, we use to organise it in such a way that different teachers from different schools can participate and teach. When learners have a new person in front of them, at least they tend to listen and to be serious, than seeing*

*the same person all the time. Although, the remedial classes and afternoon classes are not easy, but the spring school was helping.*

Yet, another Teacher C said:

*Development of the termly workshops where teachers will be trained and doing agreements on the schemes of work, so the teachers will also get training on how to finish the syllabus on time since the content is large. Maybe, the Ministry of Education can reduce the content of the syllabus because the content is really large…….*

Another Teacher D said:

*The only thing that I think we need to do is to identify learners with problems. Sometimes, if a learner is not performing very well, you call the learner and talk to him/her. If the learner is still not improving, we also call in the parents in order to find out what is the situation of the kid at home if there is a problem at home or something.*

Another Teacher E said:

*Learners need to be more motivated by the parents and we need more motivational speakers to make the lessons interesting, take these kids for tours to at least to observe real life situations that we talk about in classes.*

Another Teacher F said:

*As teachers, we should try and go the extra mile, there are videos out there and most of our schools have internet access. Learners learn more when they are seeing it. So, the use of media is one solution. We also need to introduce extra classes, maybe on Saturdays at least once or twice a month can actually help. Another thing is that we should try and bring in advisory teachers to help and motivate the learners. Teachers should look at past questions and give them to the learners to expose them from the beginning so that they are familiar with the questions. The teachers should also go through examiners' reports. And one important thing is that, we should not give up, we should just try, I know it's frustrating sometimes but we should try not to give up. Maybe sometimes, the teacher is the problem, you as a teacher should give the learners an opportunity to evaluate you to see what is the issue and why are they failing.*

And Teacher G said:

*We have to first, tackle the disciplinary problems and then second, teachers should tell the learners how they should answer questions.*

The responses of teachers from the interviews indicated the following suggestions that could be put in place to improve learners' academic performance:

- Put in place ways of motivating both teachers and learners. For example, external speakers or advisory teachers could be invited to schools or held workshops to motivate teachers as well as to provide professional training on how to make

lessons interesting to learners by using real life situations which is in line with what Borna (2015) stated that teachers' attitude towards the subject could influence the learners attitude towards learning. It is also suggested that parental involvement is needed to motivate learners as Allen (2014) alluded that learners who are actively engaged in fieldwork inevitably broaden their worldviews as well as gaining valuable skills that could generally enhance their academic performance.

- Another suggestion mentioned is to have holidays/spring schools, as well as use of different teachers during those holiday/spring school sessions. According to Jinga and Ganga (2011) holiday lessons are crucial as they avail an opportunity for teachers to teach topics/ concepts they did not cover during school terms and to help pupils who had problems mastering certain concepts. This opportunity can also allow learners to ask question and allow teachers to do revision.

- Planning seem to be another crucial challenge that teachers experience. It is suggested that teachers be assisted by school inspectors and advisory/subject teachers to set up scheme of work and to provide ways of how to complete the scheme of work in good time.

- It is also suggested that teachers identify and provide individual assistance to learners with problems by improving the guidance and counselling systems at all government schools.

- Another suggestion is that teachers should improve the teaching strategies, for example using modern technologies during instruction as espoused by

Anwaruddin (2013) that the uses of media might allow learners to grasp learning content in a better way and thus, enhancing learners' understanding during instructions.

- Lastly it was suggested that teachers should use past examination papers and examiners' reports to expose learners to ways of examination assessment.

## 4.5 Summary

The findings of the study are summarised as follows:

- It was found out that the majority of teachers teaching Biology at the participating school sites in //Kharas education region are qualified and have a Bachelor of Education Degree Honours (majoring in Biology) and there were some teacher who were under qualified to teach Biology at senior secondary level as they were having Basic Education Teacher Diploma, Advanced Certificate in Education, Master Degree in Education, Technology & Society, and Bachelor of Technology Degree (majoring in Management). These qualifications are considered to be under qualification for training teachers teaching Biology.
- The study found out that the majority of teachers are having less experience of less than three years of teaching that could be a limiting factor in their pedagogical content knowledge of teaching Biology, thereby decreasing the chances of assisting learners to learn effectively Biology content.

- Since majority of teachers were less experience in teaching Biology, it was found out that they were challenged to provide instruction by employing a variety of teaching method. Although the majority of the participating teachers were aware of the variety of teaching methods they were hardly employed during instruction, mainly focused on lecture, group teaching and discussions and seem to avoid employing problem-based teaching and practical-based teaching during instructions.
- It was also found that majority of teachers do not have any difficulties in preparing lessons in advance and that they do not experience problems in identifying appropriate class activities, authentic examples from the environment in teaching Biology. It was observed that majority of the participating teachers did not indicate their weakness in teaching the Biology content. However, one could observe some challenges in handling experiments, although they indicated not to have difficulties with content of the syllabus.
- It was found that majority of learners indicated their disagreement that participating teachers gave class activities, tests, marking learners work, giving feedback on time, completing the scheme of work and syllabus on time, thus indicating a lower level of teachers' commitment in assisting learners to effectively learn.
- It was found that some of the teachers were having difficulty in completing the syllabus in time as well as teaching non contextualised Biology to learners.
- One of the well-known challenges is the availability of well-equipped laboratories and text books. Although teachers were mentioning overcrowded

classrooms as one of the challenges, it was observed that the ratio of teacher-learner was in the range of 1:30.

- It was also found that the learners were hardly availed opportunities to evaluate their own work and thereby surrounding some powers of the teacher to learner by giving over some of their power and authority to the learners to allow them to freely participate and be actively involved in the teaching and learning process will enhance academic performance.
- It was found out that poor background subject knowledge seems to have an effect on the behaviour of the learners as this seem to increase bad disciplinary behaviour. Hence, decreasing their willingness to learn Biology.
- It was also found that the following socio-economic conditions have an impact on the performance of learners: resources at home, lack of parental involvement, *shebeens* in the school vicinity, increased house chores done by learners, learners watching soccer, and emotional disturbance by teenage pregnancy.
- Possible suggestion for to overcome the challenges in different areas are:
    - motivation of teachers and learners by experts in the form of workshop or career fairs.
    - Host regular holiday/spring schools and involving various teachers in teaching to increase learners interest.
    - Regular assistance from school inspectors and advisory/subject teachers to set up scheme of work and to provide ways of how to complete the scheme of work in good time. Improve the teaching strategies, for example using modern technologies during instruction

- MoE to improve the guidance and counselling systems at all government schools.
- Improving the use of past examination papers and examiners' reports to expose learners to ways of examination assessment.

In this chapter, the researcher presented, analysed and discussed the results of the study about challenges facing teachers and learners which might contribute to poor academic performance and described the main findings of the study.

The next chapter deals with summary, conclusions and recommendations of the study.

# CHAPTER FIVE

# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Introduction

In this chapter, the researcher provides a summary, conclusions and recommendations of the study with specific reference to the main research questions. The purpose of the study was to investigate challenges that teachers and learners experience in NSSCO Biology which contribute to grade 12 learners' poor performance in NSSCO Biology level in the //Kharas region of Namibia. The summary, conclusions and recommendations are presented according to the research questions listed below:

- **Research question one:** What are the challenges experienced by NSSCO Biology teachers affecting the learners' academic examination performance in Grade 12 NSSCO Biology in the //Kharas Region?
- **Research question two:** What are the challenges experienced by Grade 12 NSSCO Biology learners affecting their academic examination performance in the //Kharas Region?
- **Research question three:** What do the NSSCO Biology teachers perceive as possible solutions to overcome the challenges they experience?

The next section presents the summary, conclusions and recommendations of the study according to the research questions as mentioned above.

## 5.2 Research Question One: What are the challenges experienced by NSSCO Biology teachers affecting the learners' academic examination performance in Grade 12 NSSCO Biology in the //Kharas Region?

### *5.2.1 Conclusions*

- The majority of teachers teaching Biology at the participating school sites in //Kharas education region are qualified and have a Bachelor of Education Degree Honours (majoring in Biology) and there was some teacher who were under qualified to teach Biology at senior secondary level as they were having Basic Education Teacher Diploma, Advanced Certificate in Education, Master Degree in Education, Technology & Society, and Bachelor of Technology Degree (majoring in Management). These qualifications are considered to be under qualification for training teachers teaching Biology.
- The majority of teachers are having less experience of less than three years of teaching that could be a limiting factor in their pedagogical content knowledge of teaching Biology, thereby decreasing the chances of assisting learners to learn effectively Biology content.
- The majority of teachers that were less experience in teaching Biology, it was found out that they were challenged to provide instruction by employing a variety of teaching method. Also, the majority of the participating teachers were aware of the variety of teaching methods they were hardly employed during instruction, mainly focused on lecture, group teaching and discussions and seem

to avoid employing problem-based teaching and practical-based teaching during instructions.

- The majority of teachers do not have any difficulties in preparing lessons in advance and that they do not experience problems in identifying appropriate class activities, authentic examples from the environment in teaching Biology. It was observed that majority of the participating teachers did not indicate their weakness in teaching the Biology content. However, one could observe some challenges in handling experiments, although they indicated not to have difficulties with content of the syllabus.
- The majority of learners indicated their disagreement that participating teachers gave class activities, tests, marking learners work, giving feedback on time, completing the scheme of work and syllabus on time, thus indicating a lower level of teachers' commitment in assisting learners to effectively learn.
- Some of the teachers were having difficulty in completing the syllabus in time as well as teaching non contextualised Biology to learners.
- One of the major challenges is the availability of well-equipped laboratories and text books.

### *5.2.2 Recommendations*

- Capacity building workshops to assist less experienced teachers with ways on how to prepare lessons and teaching NSSCO Biology content interestingly to the learners.

- External speakers such as school inspectors and subject advisors to provide assistance to teachers on giving instructions using various methods and planning the scheme of work to help in completion of the syllabus in time.
- The schools should be assisted with updating the school laboratories with the needed equipment that they need to teach practical-based activities.

## 5.4 Research question Two: What are the challenges experienced by Grade 12 NSSCO Biology learners affecting their academic examination performance in the //Kharas Region?

### *5.3.1 Conclusions*

- The majority of learners were hardly availed opportunities to evaluate their own work and thereby surrounding some powers of the teacher to learner by giving over some of their power and authority to the learners to allow them to freely participate and be actively involved in the teaching and learning process will enhance academic performance.
- The majority of learners were found to have poor background subject knowledge seems to have an effect on the behaviour of the learners as this seem to increase bad disciplinary behaviour. Hence, decreasing their willingness to learn Biology.
- The majority agreed that the following socio-economic conditions have an impact on the performance of learners: resources at home, lack of parental involvement, *shebeens* in the school vicinity, increased house chores done by

learners, learners watching soccer, and emotional disturbance by teenage pregnancy.

### *5.3.2 Recommendations*

- Parents to be more involved in assisting with eliminating the socio-economic conditions of learners to ensure conducive learning environment of learners at home.

## 5.5 Research question Three: What do the NSSCO Biology teachers perceive as possible solutions to overcome the challenges they experience?

### *5.4.1 Conclusions*

- Possible suggestion for to overcome the challenges in different areas are:
    - motivation of teachers and learners by experts in the form of workshop or career fairs.
    - Host regular holiday/spring schools and involving various teachers in teaching to increase learners interest.
    - Regular assistance from school inspectors and advisory/subject teachers to set up scheme of work and to provide ways of how to complete the scheme of work in good time. Improve the teaching strategies, for example using modern technologies during instruction
    - MoE to improve the guidance and counselling systems at all government schools.

- Improving the use of past examination papers and examiners' reports to expose learners to ways of examination assessment.

### *5.4.2 Recommendations*

- Motivational speech and career fair programs should be used in the study area to encourage and motivate the learners to work harder NSSCO Biology.
- The MoE should improve the guidance and counselling systems at all government schools.
- Organise holiday/spring schools for learners

## 5.5 Summary

In this chapter, the researcher presented the conclusions and recommendations of the study. The main conclusions revealed that there are teacher challenges and learner challenges affecting the learners' academic performance of Grade 12 learners in NSSCO Biology in the //Kharas Region.

## References


Achor, E. E., Agogo, P. O., & Orokpo, C. A. (2011). Some Nigeria students' performance in practical and theoretical chemistry tests as predictors of their performance in MOCK-SSCE chemistry examinations. *Researcher, 3*(12), 30-37.

Agashe, L. (2004). *Sustainable development and cooperative learning in the formal education system in India*. Progress of Education. Pune: Vidyarthi Griha Prakashan.

Ajayi, I. A. (2012). Mass failure of students in West African Senior School Certificate Examinations (WASSCE) in Nigeria: *The Teachers' Perspective*. The Clute Institute.

Aladejana, F., & Aderibigbe, O. (2007). Science laboratory environment and academic performance. *Journal of Science Education and Technology, 16*(6), 500-506.

Anderman, E. M., Sinatra, G. M., & Gray, D. L. (2012). The challenges of teaching and learning about science in the 21 st Century: Exploring. *Studies in Science Education, 48*(1), 89-117.

Anwaruddin, S. M. (2013). *Understanding by design: EFL Teachers' Perceptions*. Retrieved from, http://www.asian-efl-journal.com

Aschbacher, P. R., Ing, M., & Tsai, S. M. (2013). Boosting student interest in science. *The Phi Delta Kappan*, 95(2), 47-51.

Barker, S. (2007). Reconnecting with nature; learning from the media. *Journal of Biological Education*, 41(4), 147-149.

Bertram, C. A. (2015). *Understanding Research.* Pretoria: Van Schaik Publishers.

Bui, Y. N. (2014). *How to write a master's thesis* (2nd ed.). San Francisco: SAGE Publications.

Borna, T. (July–December, 2015 ). Analyzing teachers' role in converting unsuccessful self-image of a learner into a successful one. *ASA University Review, 9*(2), 301-315.

Check, J., & Schutt, R. K., (2012). *Research methods in education*. San Francisco: SAGE Publications.

Cohen, L., Manion, L., & Morrison, K. (2011). *Research methods in education* (7th ed.). New York: Rotledge.

Creswell, J. W. (2014). *Educational Research* (4th ed.). Boston: Pearson Education Inc.

David, N. M. (2014). *Determinants of poor academic performance of secondary school*

*students in Sumbawanga District, Tanzania. Unpublished* Master's Thesis Sokoine University of Agriculture.

Education Management Information Systems (EMIS) (2017, April). *Education Statistics 2017*. Keetmanshoop: Directorate of Planning and Development: Ministry of Education.

Eiser, S., & Knight, B. A. (2008). Professional development for biology teachers in the knowledge economy. *Journal of the Australian Science Teachers Association*, 54(2), 14-18.

Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T. S., Johnson, D. W., & Beechum, N. O. (2012). *Teaching adolescents to become learners. The role of noncognitive factors in shaping school performance: A critical literature review*. Chicago: University of Chicago Consortium on Chicago School Research.

Garuba, M. A., Agweda, F. E., & Abumere, D. I. (2012). The contribution of science and technology education to national development: The Nigerian experience. *Journal of Education and Practice*, 3(1), 16-22.

Goodman, R. F. (2001). *Bullies. more than sticks, stones and name calling*. New York: St John's University publication.

Graziano, K. J. (2016). Peer Teaching in a Flipped Teacher Education Classroom. *Tech Trends*, 1-9.

Haimbodi, F. N. (2012). *The effects of cooperatives learning on motivation and Performance of grade 11 higher level mathematics learners in the Oshana Education Region* (Unpublished Master's thesis, University of Namibia).

Harris, J. C., & Rooks, D. L. (2010). Managing inquiry-based science: challenges in enacting complex science instruction in elementary and middle school classrooms. *Journal of Science Teacher Education*, 21(2), 227-240.

Hollins, E. (2011). Teacher preparation for quality teaching. *Journal of Teacher Education, 62*(4), 395-407. doi:10.1177/0022487111409415

Jackson, M.M. (2009). *An investigation into the factors contributing to the poor performance of Grade 12 (COSC) learners in Lesotho* (Unpublished Master's Thesis, University of Zululand).

Jinga, N., & Ganga, E. (2011). Effects of holiday lessons and financial pressures on low-income families and households in Masvingo, Zimbabwe. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS),* 2 (6), 465-470.

Johnson, B., & Christensen, L. (2014). *Educational research: quantitative, qualitative, and mixed approaches*. (5th ed.). London: SAGE Publications.

Kapenda, H. M., Kandjeo-Marenga, H. U., !Gaoseb, N., Kasanda, C. D., & Lubben, F. (2001, January 17-20). The role of practical work in science teaching in Namibia. (I. V. Mutimucuio, Ed.) *Promoting regional collaboration in research in Mathematics, Science and Technology Education in Southern Africa*, 1, 411-421.

Kapenda, H. M., Kandjeo-Marenga, H. U., Kasanda, C. D., & Lubben, F. (2002). Characteristics of pratical work in science classrooms in Namibia. *Research in Science & Technology Education, 20*(1), 54-61.

Kasanda, C. D. (2004). *Teacher education in Africa: Why the mathematics and science teacher extension programme works in Namibia.* Windhoek: University of Namibia.

Khoboli, B., & O'Toole, J. M. (2011). Learner-centred science in Lesotho: Adapting the ideal to adjust classroom practice. *African Journal of Research in MST Education*, 15(1), 80-91.

Lang, P. A. (2001). Letter fourteen: Classroom environment. *Straight Talk: Growing as Multicultural Educators, 149*, 203-214.

Lawrence, D. (2009). *Enhancing self-esteem in the classroom* (3rd ed.). Singapore: SAGE Publications.

Lebata, C. M., & Mudau, A. V. (2014). Exploring factors affecting performance in Biology 5090 at selected high schools in Lesotho. *Mediterranean Journal of Social Sciences, 5*(8), 275-278.

Marais, P. (2016). We can't believe what we see: Overcrowded classrooms through the eyes of student teachers. *South African Journal of Education, 36*(2), 1-10.

Marincola, E. (2006). Why is public science education important? *Journal of Translational Medicine,* 4(7), Retrieved from: http://doi:10.1186/1479-5876-4-7.

Marx, R. W., & Harris, C. J. (2006). No child left behind and science education: opportunities, challenges, and risks. *The Elementary School Journal, 106*(5), 467-478.

Mertens, D. M. (2010). *Research and evaluation in education and psychology*. Los Angeles: SAGE Publications.

Mhlamvu, N. V. (n.d). *Conceptual Understanding of Photosynthesis.* Submitted to the faculty of education in fulfilment of the requirements for the award of the degree of Master of Education in the department of Mathematics, Science and Technology of Education, University of Zululand (Unpublished dissertation).

Ministry of Education and Culture (MEC) (1993). *Towards education for all. A Development brief for education, culture, and training*. Windhoek: Gamsberg Macmillan.

Ministry of Education (2010). *The National Curriculum for Basic Education*. Okahandja: NIED.

Ministry of Education. (2014). *The National Curriculum for Basic Education*. Okahandja: NIED.

Ministry of Education. (2012). *Circular: DNEA 22/2013. NSSCO Senior Level examination 2013*. Windhoek: DNEA.

Ministry of Education. (2013). *Circular: DNEA 22/2014. NSSCO Senior Level examination 2014*. Windhoek: DNEA.

Ministry of Education. (2014). *Circular: DNEA 22/2015. NSSCO Senior Level examination 2015*. Windhoek: DNEA.

Ministry of Education. (2015). *Circular: DNEA 22/2016. NSSCO Senior Level examination 2016*. Windhoek: DNEA.

Ministry of Education. (2016). *Circular: DNEA 22/2017. NSSCO Senior Level examination 2017*. Windhoek: DNEA.

Mosibudi, D. M. (2012). *Factors Affecting Academic Performance of Grade 12 learners.* In Mogalakwena Circuit: Dissertation submitted in partial fulfilment of the requirement for the master's degree in Public Administration (MPA). Faculty of Management and Law. Turfloop Graduate School of Leadership at the University of Limpopo.

Muraya, D. N., & Kimamo, G. (2011, ). Effects of cooperative learning approach on biology mean achievement scores of secondary school students' in Machakos district, Kenya . *Educational Research and Reviews , 6*(12), 726-745.

Muyoyeta, N. K., Abah, J., & Denuga, D. (2017, June). School- based factors affecting Grade 12 learners' academic performance in Namibia Senior Secondary Certificate Ordinary Level Biology in the Khomas educational region, Namibia. *International Journal of Education, Learning and Development, 5*(5), 23-37.

Nakanyala, J. M. (2015). *Investigating factors affecting the effective teaching of Grade 12 Physical Science in selected secondary schools in the Oshana educational region in Namibia* (Master's thesis, University of Namibia).

Nghipandulwa, L. L. T. (2011). *Secondary school teachers' perceptions of the importance of practical work in Biology in Oshana Education Region* (Master's thesis, University of Namibia).

Piaget, J. (1969). *The mechanism of perception*. London: Routledge and Kegan Paul.

Ragan, T. J., Smith, P. L., & Curda, L. K. (2008). Outcome-referenced, conditions-based theories and models. *Handbook of research on educational communications and technology*, 383-399.

Rammala, M. S. (2009). *Factors contributing towards poor performance of grade 12 learners at Manoshi and Mokwatedi High Schools.* Masters' thesis. Turfloop School of Leadership.

Schneider, R. M., & Plasman, K. (2011). Science teacher learning progressions: A review of science teachers' pedagogical content knowledge development. *Review of Educational Research*, 81(4), 530-565.

Schreuder, A. M. G., & Coetzee, M. (2008). *Careers an organisational perspective* (3rd ed.). Lansdowne: Juta & Co. Ltd.

Wong, A. F. L., & Fraser, B. J. (1996). Environment attitude associations in the chemistry laboratory classroom. *Research Science Technology Education*, 14, 91-102.

## Appendix A: Research Permission letter

**CENTRE FOR POSTGRADUATE STUDIES**

University of Namibia, Private Bag 13301, Windhoek, Namibia
340 Mandume Ndemufayo Avenue, Pioneers Park
☎ +264 61 206 3275/4662; Fax +264 61 206 3290; URL: http//www.unam.edu.na

UNAM
UNIVERSITY OF NAMIBIA

**RESEARCH PERMISSION LETTER**

**Student Name:** MS. VICTORIA N. VERNER

**Student number:** 200827120

**Programme:** Master of Education (Science Education)

**Approved research title:** Investigating challenges affecting grade 12 learners' performance in Namibia Senior Secondary Certificate Ordinary level Biology in the //Kharas education region, Namibia

**TO WHOM IT MAY CONCERN**

I hereby confirm that the above mentioned student is registered at the University of Namibia for the programme indicated. The proposed study met all the requirements as stipulated in the University guidelines and has been approved by the relevant committees.

The proposal adheres to ethical principles as per attached Ethical Clearance Certificate. Permission is hereby granted to carry out the research as described in the approved proposal.

Centre for Postgraduate Studies
Office of the Director
2018 -05- 21
University of Namibia
UNAM

Best Regards

Prof. Marius Hedimbi

Director: Centre for Postgraduate Studies

Tel: +264 61 2063275

E-mail: directorpgs@unam.na

21 May 2018

## Appendix B: Permission from the PS

REPUBLIC OF NAMIBIA

**MINISTRY OF EDUCATION, ARTS AND CULTURE**

*Tel: +264 61 -2933200*
*Fax: +264 61- 2933922*
*Enquiries: C. Muchila/ G. Munene*
*Email: Cavin.Muchila@moe.gov.na/gm12munene@yahoo.co.uk*

*Luther Street, Govt. Office Park*
*Private Bag 13186*
*Windhoek*
*Namibia*

File no: 11/1/1

Ms. Victoria N. Verner
P. O. Box 2912
Windhoek
Cell: 081 220 3964

Dear Ms V. N. Verner

**SUBJECT: PERMISSION TO CONDUCT RESEARCH IN /KHARAS REGION**

Kindly be informed that permission to conduct an academic research for your Master's Degree on *"Investigating Challenges affecting Grade 12 Learners' Performance in Namibia Senior Secondary Certificate Ordinary Level Biology in /Kharas Education Region, Namibia,* is here with granted. You are further requested to present the letter of approval to the Regional Director to ensure that research ethics are adhered to and disruption of curriculum delivery is avoided.

Furthermore, we humbly request you to share your research findings with the Ministry. You may contact Mr. C. Muchila/ Mr. G. Munene at the Directorate: Programmes and Quality Assurance (PQA) for provision of summary of your research findings.

I wish you the best in conducting your research and I look forward to hearing from you upon completion of your study.

Sincerely yours

Education, Arts and Culture
Office of the Permanent Secretary
2018 -07- 11
Private Bag 13186
Windhoek, Namibia

SANET L. STEENKAMP
**PERMANENT SECRETARY**

11/7/18
Date

***All official correspondences must be addressed to the Permanent Secretary***

## Appendix C: Request for permission from the PS

P.O. BOX 2912
Windhoek
Cell: 081 220 3964
22 June 2018

The Permanent Secretary
Ministry of Basic Education, Arts and Culture
Private Bag 13186
Windhoek

Dear Ms Steenkamp

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN SCHOOLS IN THE //KHARAS REGION

I am a registered student at the University of Namibia pursuing a Master's degree in Science Education. In fulfillment of the requirements for the completion of this degree, I am required to conduct a research project. I kindly request your office to allow me to use the senior secondary schools in the //Kharas region as my research sites.

My thesis topic is: **Investigating challenges affecting grade 12 learners' academic performance in Namibia Senior Secondary Certificate Ordinary level Biology in the //Kharas Education region, Namibia.**

The first phase of the research project will involve distributing questionnaire to Grade 12 Biology learners and teachers in seven senior secondary schools in the //Kharas region offering NSSCO Biology. The second phase of the research will involve a sample of 14 learners and 7 teachers chosen on the basis of the results of the first phase of the research. These participants will be interviewed to obtain in-depth information. The information gathered will be treated with high confidentiality and will be used solely for the purpose of the research.

I hope that the results of this study will positively contribute towards improving the academic performance of learners in the //Kharas Educational region as it will help discover some of the challenges that might have not been identified by education stakeholders thereby improving learner performance.

Should your office have any queries about this request, please contact my supervisor Dr. J. Abah at 081 407 2449, email: jabah@unam.na

I thank you in advance and look forward to your positive response in this matter.

Yours in education

Ms Victoria N Verner
Master of Science Education Student

## Appendix D: Permission letter from the //Kharas education Director

**||KHARAS REGIONAL COUNCIL**
**DIRECTORATE OF EDUCATION, ARTS and CULTURE**

Tel: (063) 227000
Fax: (063) 223800

Private Bag 2160
KEETMANSHOOP

**Date:** 18 June 2018
**File Ref. No.:** 15/1

**Victoria N Verner**
**Teacher: PK de Villiers Secondary School**
**P O Box 2074**
**KEETMANSHOOP**

**SUBJECT: Approval to conduct research at schools located in ||Kharas Region**

**Dear Victoria N Verner**

1) Your letter dated 12 June 2018, Subject: *Request to conduct a research study in seven secondary schools in the ||Kharas Education Region*, bear reference.

2) Permission is hereby granted to you to conduct a study amongst teachers and learners at **seven public secondary schools** in the **||Kharas Region** which are resorting under the armpit of the Directorate of Education, Arts and Culture, on the topic "*Investigating challenges affecting Grade 12 learners' academic performance in Namibia Senior Secondary Certificate Ordinary Level Biology in the ||Kharas Education Region*" on condition that the **anonymity of schools and the respondents (teachers and learners) would be guaranteed.**

3) Please present this letter to the Principals of State schools, whenever you would visit a school and agree on the most suitable time-slot for research engagements.

4) Note must however be taken of the limitation that the engagement with the teachers and the learners at the respective schools is not supposed to lead to the disruption and or interruption of teaching and learning programmes and or processes, or the discontinuation of the teaching duties of teachers during normal school hours at the schools where you are going to conduct research.

5) Lastly, the Regional Management Committee of the Directorate: Education, Arts and Culture in the ||Kharas Regional Council would like to request you to share your research findings with this directorate for insightful planning purposes, as you have pledged in your letter. dated 12 June 2018, Subject: *Request to conduct a research study in seven secondary schools in the ||Kharas Education Region.*

Yours faithfully

.....

**|Awebahe Johannes ||Hoeseb**
**Regional Director of Education, Arts and Culture**

## Appendix E: Request for permission from the Director

P.O. BOX 2912
Windhoek
Cell: 081 220 3964
05 June 2018

The Director of Education
//Kharas Educational Region
Private Bag 2160
Keetmanshoop

Dear Mr //Hoeseb

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN SCHOOLS IN THE //KHARAS REGION

I am a registered student at the University of Namibia pursuing a Master's degree in Science Education. In fulfillment of the requirements for the completion of this degree, I am required to conduct a research project. I kindly request your office to allow me to use the senior secondary schools in the //Kharas region as my research sites.

My thesis topic is: **Investigating challenges affecting grade 12 learners' academic performance in Namibia Senior Secondary Certificate Ordinary level Biology in the //Kharas Education region, Namibia.**

The first phase of the research project will involve distributing questionnaire to Grade 12 Biology learners and teachers in seven senior secondary schools in the //Kharas region offering NSSCO Biology. The second phase of the research will involve a sample of 14 learners and 7 teachers chosen on the basis of the results of the first phase of the research. These participants will be interviewed to obtain in-depth information. The information gathered will be treated with high confidentiality and will be used solely for the purpose of the research.

I hope that the results of this study will positively contribute towards improving the academic performance of learners in the //Kharas Educational region as it will help discover some of the challenges that might have not been identified by education stakeholders thereby improving learner performance.

Should your office have any queries about this request, please contact my supervisor Dr. J. Abah at 081 407 2449, email: jabah@unam.na

I thank you in advance and look forward to your positive response in this matter.

Yours in education

Ms Victoria N Verner
Master of Science Education Student

## Appendix F: Participant information leaflet and Consent form

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

**ANNEX 5**

**TITLE OF THE RESEARCH PROJECT: INVESTIGATING CHALLENGES AFFECTING GRADE 12 LEARNERS' ACADEMIC PERFORMANCE IN NAMIBIA SENIOR SECONDARY CERTIFICATE ORDINARY LEVEL BIOLOGY IN THE //KHARAS EDUCATION REGION, NAMIBIA**

**REFERENCE NUMBER: 200827120**

**PRINCIPAL INVESTIGATOR: VICTORIA N VERNER**

**ADDRESS: P.O. BOX 2912, WINDHOEK**

**CONTACT NUMBER: 0812203964**

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff or doctor any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the Research Ethics Committee at The University of Namibia and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and Namibian National Research Ethics Guidelines.

1. What is this research study all about?

*a) Where will the study be conducted; are there other sites; total number of participants to be recruited at your site and altogether.*

**The study will be conducted at seven senior secondary schools in the //Kharas Educational region, with a total number of 153 participants altogether.**

*b) Explain in participant friendly language what your project aims to do and why you are doing it?*

**The aim of this study is to discover the challenges that teachers' and learners' experience in teaching and learning Biology and bring out strategies that they can use to enhance learners' academic performance in Biology [NSSC] Ordinary Level national examinations in the region.**

*c) Explain all procedures.*

*d) Explain any randomization process that may occur.*

*N/A*

*e) Explain the use of any medication, if applicable.*

N/A

2. Why have you been invited to participate?

*a) Explain this question clearly.*

**To provide relevant information with respect to the challenges you experience and possible solutions on how to overcome the challenges they experience in NSSC ordinary level Biology.**

3. What will your responsibilities be?

*a) Explain this question clearly.*

**Your participation in this study will be completion of the questionnaire and interviews**

*b) Explain the duration the participant is expected to participate in the study (i.e. 2 hours, 4 days, etc.)*

**Approximately 1 hour and 30 minutes**

4. Will you benefit from taking part in this research?

a) Explain all benefits objectively. If there are no personal benefits then indicate who is likely to benefit from this research e.g. future patients.

**There are no personal benefits but, future learners will benefit as the study will bring out strategies that learners and teachers can use to enhance learners' academic performance in Biology [NSSC] Ordinary Level national examinations in the region.**

5. Are there in risks involved in your taking part in this research?

a) Identify any risks objectively.

**None**

6. If you do not agree to take part, what alternatives do you have?

*b) Clearly indicate in broad terms what alternative treatment is available and where it can be accessed, if applicable.*

***N/A***

7. Who will have access to your medical records?

*a)* *Explain that the information collected will be treated as confidential and protected. If it is used in a publication or thesis, the identity of the participant will remain anonymous. Clearly indicate who will have access to the information.*

***N/A***

8. What will happen in the unlikely event of some form injury occurring as a direct result of your taking part in this research study?

*a)* *Clarify issues related to insurance cover if applicable. If any pharmaceutical agents are involved will compensation be according to ABPI guidelines? (Association of British Pharmaceutical Industry compensation guidelines for research related injury which is regarded as the international gold standard). If yes, please include the details here. If no, then explain what compensation will be available and under what conditions.*

***N/A***

## 9. Will you be paid to take part in this study and are there any costs involved?

NO

## 10 Is there anything else that you should know or do?

*a)* *You should inform your family practitioner or usual doctor that you are taking part in a research study. (Include if applicable)*

*b)* *You should also inform your medical insurance company that you are participating in a research study. (Include if applicable)*

*c)* *You can contact Dr …….…….. at tel …… if you have any further queries or encounter any problems.*

*d)* *You can contact the Centre for Research and Publications* **at +264 061 2063061; pclaassen@unam.na***if you have any concerns or complaints that have not been adequately addressed by the investigator.*

*e)* *You will receive a copy of this information and consent form for your own records.*

11. Declaration by participant

By signing below, I ……. agree to take part in a research study entitled *(insert title of study)*.

**I declare that:**

a) I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.

b) I have had a chance to ask questions and all my questions have been adequately answered.

c) I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.

d) I may choose to leave the study at any time and will not be penalised or prejudiced in any way.

e) I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) ..... on (*date*) ……..…….. 2018.

…… ……

Signature of participant Signature of witness

12. Declaration by investigator

I *(name)*declare that:

- I explained the information in this document to ……..
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use a interpreter. (*If a interpreter is used then the interpreter must sign the declaration below.*

Signed at (*place*) ..... on (*date*) ……..…….. 2018.

…… ……

Signature of investigator Signature of witness

## Appendix G: Teacher Questionnaire

### Questionnaire for teachers

### Introduction

My name is Victoria Verner, a student doing Master in Education (Science Education) Degree at the University of Namibia. I am doing a research to determine your views on the *Challenges affecting Grade 12 learners' performance in Namibia Senior Secondary Certificate Ordinary level Biology in the //Kharas education region*. Please answer the following questions as sincerely as possible.

### SECTION A: BIOGRAPHIC INFORMATION

1. Your sex ----------

2. Your highest Education Qualification ----------

3. What are the teaching subjects that you have specialised in? ----------
---

4. Number of years of teaching experience ----------

5. For how many years have you been teaching Grade 12 Biology Ordinary Level? ------

### SECTION B: PERCEIVED CHALLENGES THAT TEACHERS EXPERIENCE IN TEACHING GRADE 12 BIOLOGY [NSSC] ORDINARY LEVEL

Please indicate the extent to which you agree, strongly agree, disagree, strongly disagrees with the statements below by putting a cross (X) in one box per statement.

### 1. Teaching methods you use in teaching Biology Ordinary Level at your school

| **Teaching methods used** | agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 1.1 I use lecture method in my teaching often. | | | | |
| 1.2 I use problem-based learning method often. | | | | |
| 1.3 I use group work method often. | | | | |
| 1.4 I use discussion method often. | | | | |
| 1.5 I use practical method often. | | | | |

**2. Teachers' content knowledge of Biology Ordinary Level at your school**

| **Statements** | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 2.1 I understand the contents of Biology Ordinary Level syllabus very well to explain to my learners. | | | | |
| 2.2 It is difficult to prepare my Biology Ordinary Level lesson plans in advance for the lesson presentation. | | | | |
| 2.3 I find it difficult to identify appropriate class activities that fit the syllabus' basic competencies. | | | | |
| 2.4 I find it difficult to use authentic (real-life) examples from the environment when teaching Biology (e.g. uses of enzymes in our daily lives). | | | | |
| 2.5 I know how to use examination reports in my teaching of Biology content. | | | | |
| 2.6 I cannot handle some of the experiments in the syllabus. | | | | |

**3. Teachers' pedagogical knowledge of Grade 12 Biology Ordinary Level**

| **Statements** | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 3.1 My lesson introduction engages learners and directs them toward the lesson objectives. | | | | |
| 3.2 I allow construction of knowledge in my subject | | | | |
| 3.3 Learning takes place in a social learning environment | | | | |
| 3.4 I continuously monitor and assess learning | | | | |
| 3.5 I give learners' the opportunity to learn | | | | |
| 3.6 The quality and levels of instruction are high | | | | |
| 3.7 I have knowledge of classroom management: maximising the quantity of instructional time, handling classroom events, teaching at a steady pace and maintaining clear direction in lessons | | | | |
| 3.8 My English is good enough to make my learners understand Biology Ordinary Level topics. | | | | |
| 3.9 I have knowledge of teaching methods: having a command of various teaching methods, knowing when and how to apply each method; | | | | |
| 3.10 I have knowledge of classroom lesson assessment: | | | | |
| 3.11 I know how to adapt and handle heterogeneous learning groups in the classroom | | | | |

**4. Teachers' commitments toward teaching Biology Ordinary Level at your school**

| **Statements** | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 4.1 I come to my Biology lessons on time most often. | | | | |
| 4.2 I give class activities after every lesson | | | | |
| 4.3 I give a test after every chapter taught. | | | | |
| 4.4 I mark all my learner' work on time. | | | | |
| 4.5 I provide feedback on time to my learners. | | | | |
| 4.6 I finish the scheme of work every term on time. | | | | |
| 4.7 I finish the syllabus before the final examinations start, every year. | | | | |
| 4.8 I always do revision with my learners before every final examination starts. | | | | |

**5. Teachers' support to Biology Ordinary Level learners at school**

| **Statements** | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 5.1 I provide short and well planned notes to my learners. | | | | |
| 5.2 I provide clear instructions and guidance for activities and homework. | | | | |
| 5.3 I make sure all class activities and homework are supporting the development of basic competencies as indicated in the syllabus. | | | | |
| 5.4 I provides appropriate feedback to my learners both orally and written. | | | | |
| 5.5 I make sure all my learners have done corrections on mistakes in all previous work. | | | | |
| 5.6 I use different teaching methods in teaching Biology that support effective teaching. | | | | |
| 5.7 I use variety of activities in my teaching (e.g. presentations, role plays, written work, practical work etc) | | | | |

**6. Teaching of Biology Ordinary Level curriculum**

| Statements | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 6.1 Time allocated for Biology Ordinary level lessons on my timetable is enough. | | | | |
| 6.2 Double periods for Biology Ordinary level are not available on my timetable. | | | | |
| 6.3 Remedial classes for Biology Ordinary level are not scheduled on my timetable. | | | | |
| 6.4 Most of the Biology Ordinary Level textbooks that I use are not matching with the Namibian context. | | | | |

**7. Availability of Biology Ordinary Level resources at your school**

| Statements | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 7.1 I have adequate teaching and learning materials for Biology Ordinary Level (e.g. reference textbooks and past examination question papers etc). | | | | |
| 7.2 We have a Biology laboratory at our school. | | | | |
| 7.3 The laboratory has all equipment and resources (e.g. chemicals, test-tubes, and measuring cylinders, etc). | | | | |
| 7.4 All my Grade 12 learners have their own textbooks (not sharing textbooks). | | | | |

**8. Teacher-learner interactions in the school classroom**

| Statements | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 8.1 I allow learners to ask questions during teaching. | | | | |
| 8.2 I give learners the opportunity to evaluate their own work (e.g. marking their own class activities) | | | | |
| 8.3 I allow peer teaching (e.g. learner who understands a certain topic may ask to teach others). | | | | |
| 8.4 Support effectively to support learners' cognitive development and language growth | | | | |
| 8.5 Allow learners to develop skills and maintain interest in learning activities | | | | |

**9. Learners' attitudes towards learning Grade 12 Biology Ordinary Level**

| **Statements** | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 9.1 Most of the learners are willing to learn Biology Ordinary level. | | | | |
| 9.2 Most of your classmates are disciplined. | | | | |
| 9.3 Most of your classmates have poor Biology background from lower grades. | | | | |
| 9.4 Most learners do not pay attention to the teacher during Biology lessons. | | | | |
| 9.5 Most Grade 12 learners believe that Biology Ordinary level is difficult. | | | | |
| 9.6 Most Grade 12 learners do not take Biology Ordinary level work serious. | | | | |
| 9.7 Learners give disciplinary problems during practical and experimentation in the laboratory. | | | | |

**Thank you for your precious time.**

## Appendix H: Learner Questionnaire

### Questionnaire for learners

### Introduction

My name is Victoria Verner, a student doing Master in Education (Science Education) Degree at the University of Namibia. I am doing a research to determine your views on *Challenges affecting Grade 12 learners' performance in Namibia Senior Secondary Certificate Ordinary Level Biology in the //Kharas education region*. Please answer the following questions as sincerely as possible.

### PERCEIVED CHALLENGES THAT LEARNERS EXPERIENCE IN LEARNING GRADE 12 BIOLOGY [NSSC] ORDINARY LEVEL.

Please indicate the extent to which you agree, strongly agree, disagree, strongly disagrees with the statements below by putting a cross (X) in one box per statement.

**1. Teaching methods used by your teachers when teaching NSSCO Biology**

| **Teaching methods used** | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 1.1 Teachers use lecture method in my class often. | | | | |
| 1.2 Teachers use problem-based learning method often. | | | | |
| 1.3 Teachers use group work method often. | | | | |
| 1.4 Teachers use discussion method often. | | | | |
| 1.5 Teachers use practical method often. | | | | |

**2. Teacher-learner interactions in the classroom**

| **Statements** | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 2.1 Teachers allow learners to ask questions during teaching. | | | | |
| 2.2 Teachers encourage learners to ask questions. | | | | |
| 2.3 Teachers give learners the opportunity to evaluate their own works (e.g. marking their own class activities). | | | | |
| 2.4 Teachers allow learners to teach one another in the class (e.g. learner who understands a certain topic may ask to teach others). | | | | |
| 2.5 I approach the teacher if I need help | | | | |

**3. Learners' attitudes toward learning Grade 12 Biology Ordinary Level**

| **Statements** | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 3.1 Most of the learners are willing to learn Biology Ordinary level. | | | | |
| 3.2 Most of your classmates are disciplined. | | | | |
| 3.3 Most of the learners have poor Biology background from lower grades. | | | | |
| 3.4 Most learners do not pay attention to the teacher during Biology lessons. | | | | |
| 3.5 Most Grade 12 learners believe that Biology Ordinary level is difficult. | | | | |
| 3.6 Learners do not take Biology Ordinary level work serious. | | | | |
| 3.7 Learners give disciplinary problems during practical and experimentation in the laboratory. | | | | |

**4. Socio-economic conditions of Biology Ordinary Level learners at your school**

| **Statements** | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 4.1 Some of my classmates come from poor family background. | | | | |
| 4.2 The home environment for some Grade 12 learners is not conducive for studying (e.g. examinations). | | | | |
| 4.3 Some Grade 12 Biology learners are frequently absent from school. | | | | |

**5. Teachers' commitments toward teaching Biology Ordinary Level at your school**

| **Statements** | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 5.1 Teachers come to Biology lessons on time often. | | | | |
| 5.2 Teachers give class activities after every lesson | | | | |
| 5.3 Teachers give a test after every chapter taught. | | | | |
| 5.4 Teachers mark all my l works on time. | | | | |
| 5.5 Teachers provide feedback on time to the learners. | | | | |
| 5.6 Teachers finish the scheme of work every term on time. | | | | |
| 5.7 Teachers finish the syllabus before the final examinations start, every year. | | | | |
| 5.8 Teachers always do revision with the learners before every examination starts. | | | | |
| 5.9 My Biology teachers always tell long stories during teaching in class | | | | |

**6. Teachers' support to Biology Ordinary Level learners at your school**

| **Statements** | Agree | strongly agree | disagree | strongly disagree |
|---|---|---|---|---|
| 6.1. Teachers make sure that all learners have prescribed textbooks. | | | | |
| 6.2 Teachers provide short and well planned notes to learners. | | | | |
| 6.3 Teachers provide clear instructions and guidance for activities and homework. | | | | |
| 6.4 Teachers make sure all class activities and homework are linked to basic competencies described in the syllabus. | | | | |
| 6.5 Teachers provides appropriate feedback to learners both orally and written. | | | | |
| 6.6 Teachers make sure all learners have done corrections on mistakes previous work. | | | | |
| 6.7 Teachers use different teaching methods in teaching Biology that support effective teaching. | | | | |
| 6.8 Teachers use variety of activities in teaching | | | | |
| 6.9 Instructions are interesting. | | | | |

**Thank you for your precious time.**

## Appendix I: Teachers' Interview Guide

**Interview questions for teachers**
**Introduction**

My name is Victoria Verner, a student doing Master in Education (Science Education) Degree at the University of Namibia. I am doing a research to determine your views on *challenges affecting Grade 12 learners' performance in Namibia Senior Secondary Certificate ordinary level Biology in the //Kharas education region*. Please answer the following questions as sincerely as possible.

**Questions**

1. How often do you use the following teaching methods in your teaching?

| **Teaching methods** | **Never** | **Seldom** | **Often** |
|---|---|---|---|
| 1. Group work | | | |
| 2. Problem-based learning | | | |
| 3. Practical work | | | |

Depending on the answer above: In your opinion, why do you use that teaching method in your teaching the Grade12 Biology [NSSC] Ordinary Level?

2. What other teaching methods, do you think is good for teaching Grade12 Biology [NSSC] Ordinary Level?

3. In your opinion, what do you think are the factors affecting the use of:

(i) Group work;

(ii) Problem-based learning;

(iii) Practical work methods in teaching of Grade 12 Biology [NSSC] Ordinary Level in the //Kharas Region?

4. Do you use to finish your Grade 12 Biology [NSSC] Ordinary Level syllabus and scheme of work on time? If, No why?
5. What would you comment on your frequency of giving leaners' class activities and providing feedback?

6. What would you comment on your learners' discipline in your Grade 12 Biology Ordinary Level lessons?

7. What would you comment on your learners' attentiveness during practical work in the laboratory?

8. What do you do to teach Grade 12 Biology practical work to your learners in the laboratory with limited resources?

10. In your views, what strategies can be implemented to improve the teaching and learners' performance in Grade 12 Biology [NSSC] Ordinary Level in the //Kharas Education Region?

**Thank you very much for your time.**

## Appendix J: Learners' Interview Guide

### Interview questions for learners

### Introduction

My name is Victoria Verner, a student doing Master in Education Degree at the University of Namibia. I am doing a research to determine your views on *teacher – learner challenges affecting Grade 12 learners' performance in Namibia Senior Secondary Certificate Ordinary level Biology in the //Kharas education region*. Please answer the following questions as sincerely as possible.

### Questions

1. How often do your teachers use the following teaching methods in teaching?

| **Teaching methods** | **Never** | **Seldom** | **Often** |
|---|---|---|---|
| 1. Group work | | | |
| 2. Problem-based learning | | | |
| 3. Practical work | | | |

2. Why do you think most of your classmates are not willing to learn Grade 12 Biology [NSSC] Ordinary Level?

3. What would you comment on your classmates' " discipline in your Grade 12 Biology [NSSC] Ordinary Level lessons?

4. Why do you think majority of the learners do not pay attention during practical work in the laboratory?

5. Which factors in the home and school environments contribute towards the poor performance of Grade 12 learners and prevent them from achieving required results for university entrance?

**Thank you very much for your time.**