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AN ASSESSMENT OF THE CHALLENGES FACED BY GRADE 11 AND 12 TEACHERS IN THE TEACHING OF BIOLOGY IN SELECTED SCHOOLS IN THE KATIMA MULILO EDUCATION CIRCUIT

Mirabel Moakong Ayiawung, Dingindawo Ncube, David Nkengbeza

The aim of this paper was to investigate the challenges, faced by grade 11 and 12 teachers in the teaching of Biology in selected schools. The training of science teachers after independence till today has not succeeded in fully addressing the challenges teachers faced in the teaching of Biology. The study was guided by researchers like Lebata and Mudau [1], Makeleni, and Sethusha [2] who discovered that teachers faced challenges in the teaching of Biology because of the lack of well-equipped laboratories, limited prescribed textbooks, and overcrowded classes. The researchers use a case study design and a qualitative research approach in executing this study. A qualitative research approach was used in this study. The major findings include the lack of well-equipped laboratories and libraries, which have hindered the teaching and learning of Biology in the selected schools. The lack of adequate prescribed textbooks and overcrowded classrooms further hindered the teachers' ability to impart knowledge to their learners. Large Biology syllabus content and learners' poor attitude among others, are other challenges hindering the quality of teaching in the selected schools. We recommend that the Ministry of Education should build modern libraries and equip them with computers and internet connectivity, textbooks, and e-learning tools to help learners and teachers inculcate a culture of reading and studying. Teachers should introduce shared personal practice, and collective learning and application as used in professional learning communities. Teachers and principals should request for sponsors to build well-equipped laboratories and libraries for the schools. Teachers and principals can also request to temporally use the laboratories in other schools that have the needed facilities

***Keywords**: Assessment, Challenges, Teachers, Biology, Teaching, Schools, Katima Mulilo, Circuit, Overcrowded classrooms, Prescribed textbooks*

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1. Introduction

Worldwide, science education has been seen as a vital component in the development of nations. It is an indispensable subject and as a result it should be effectively taught in schools, so as to bring out individuals who can contribute to the nation building. The teaching of science concepts, which provide learners with scientific knowledge and skills, must be taken very seriously in all institutions, if they aim at achieving much in science and technology as the developed world has done. Studies, done by Mwangu and Sibanda [3] and Aloovi [4], have shown the numerous challenges that are faced by Biology teachers in the teaching of sciences in secondary schools in some developing countries.

After the Namibian independence in 1990, with the external and internal changes in the Namibian society, it led to the creation of an unexpected new situation with the optimism for the future. Namibia is among some of the countries in the world that need to prepare and strengthen her learners in the secondary schools in the area of Basic Sciences, Mathematics, and English as a result of the deficits, inherited during the apartheid period. There has been lack of well trained, suitably qualified and experienced science teachers in Namibia due to the fact that teachers for the black native population were not trained in sciences as their training curriculum excluded mathematic and sciences. The training of science teachers after independence till today has not succeeded to fully address the challenge of lack of science teachers [5].

Effective teaching is very vital as it enables the learners to reach their educational successes in and outside the classroom setting. As a results there have been signs showing that Biology teachers may have not been teaching the subject effectively to the grade 11 and 12 learners as seen from the learners' performance. There have been complaints from the parents and the authorities on the aspect of the poor performance of the learners. Also there have been series of parent teachers' meetings, held in schools discussing what could be done to improve on the poor performance of learners in Biology. There are factors that inhibit the effective teaching of Biology

in senior secondary schools. According to Computer [6], these factors include: Unqualified Biology teachers, poor teaching methods and inadequate supply of biology equipment.

According to a study by Mwangu and Sibanda [3], it was seen that most Biology teachers in Zimbabwe secondary schools were degree holders with deep content knowledge but lack pedagogical knowledge, which is very vital for lesson presentation. Over the years, science education, which includes subjects, such as Chemistry, Biology, Physics and Mathematics in Namibia, has faced several challenges.

Table 1

Grade 11 and 12 performance in Biology

Month/Grade	Total number of learners	Total number passed	% passed (A-D)
Grade 11A: August. 2019 (Ord. Level)	88	3	3.41 %
Grade 11B: August. 2019 (Ord. Level)	88	16	18.18 %
Grade 11: Nov. 2018	124	3	2.42 %
Grade 12 (Higher Level): August. 2019	122	14	11.48 %
Grade 12 (Ord. Level): August. 2019	122	41	33.61 %

Source: School archive

It can be seen from table 1 above, there is generally poor performance for both grades 11 and 12 learners in Biology (internal examinations) as the performance ranges from 2.42 % to 33.61 %.

Today, many science teachers still encounter challenges in teaching science subjects including Biology. The challenges, encountered by teachers in teaching sciences in general and Biology in particular, have motivated me to undertake this study to investigate the nature and magnitude of the challenges they face in the teaching of Biology to the grade 11 and 12 leaners in selected schools.

1. 1. Statement of the problem

Grades 11 and 12 teachers face challenges in the teaching of Biology in the Zambezi Region and this can be attested from the poor performance of their learners as explained in the background. To the best knowledge of the researcher, no documented research exists in the Katima Mulilo Education Circuit on the challenges facing the grade 11 and 12 teachers in the teaching of Biology and this has prompted the researcher to carry out this research on assessing the challenges, faced by the grade 11 & 12 teachers in the teaching of Biology in selected schools in the Katima Mulilo Education Circuit.

2. Literature review

Appropriate textbooks and other classroom resources

From experience, one can see that no meaningful teaching and learning can take place without adequate teaching resource materials [7]. According to Hewson, Kahle, Scantleyburg and Davies [8], the provision of resources is very crucial to the teaching and learning process and also to the functionality of a school. Lack of finance plays a key role in the provision of textbooks and other classroom resources. Due to this lack of finance, many valuable teaching materials, which are essential in the teaching of Biology like the virtual laboratory, Realia, model and mock-ups and manipulative materials, are often lacking [3]. This has pushed many teachers to rely on the use of the chalk and talk method in the teaching of Biology, which is not often effective. According to Colen [9], many schools faced serious shortages of textbooks. With at most three learners sharing one textbook and these number go up to about five learners sharing a single textbook in science subjects and mathematics. As a result of this teachers are limited in giving quality work from the textbooks as not every learner has the textbook and this affects the teaching and learning of Biology.

Well-equipped laboratories

Equipped laboratories are very essential for effective teaching and learning of sciences in any school. Poorly equipped schools are bound to perform poorly as neither the teachers nor the students can perform to their optimum [3]. “Biology is learned better through involving learners and this is achieved only by letting learners to carry out practical on their own. In Lesotho, most schools do not have equipped science laboratories and this affects Biology performance negatively [1].

Liswaniso [10] has explained that in some schools the situation is even more complicated as the laboratories are not well equipped. According to him [10], some teachers get prepared with the worksheet for the practical but just to discover that the apparatus and chemicals to be used may not be available.

Teacher qualification and experience

According to a study by Mwangu and Sibanda (3), it was found that most Biology teachers in Zimbabwean secondary schools are degree holders. Even though they have deep content knowledge, they however lack pedagogical knowledge, which is very vital for every successful lesson presentation. More so, studies also carried out by Ottevanger [11], have shown that some primary trained teachers have moved up through combined schools and have ended up teaching sciences in junior secondary schools. This trend has also been noted in Sub-Saharan Africa where teachers often teach classes, which they are not qualified to teach, for example primary trained teachers teaching junior secondary schools, physics teachers teaching Biology, which is often seen in poorly resourced schools [1, 11].

Curriculum implementation training

Makeleni and Sethusha [2] have explained that effective curriculum training is very essential for teachers. Recent investigation of curriculum implementation by Fleisch [12] and Moalosi and Molwane [13] revealed that

teachers face numerous challenges regarding teaching and learner achievement in South Africa and internationally. Ngware, Abuya, Mutisya and Oketch [14] and Bennel [15] in their study noted that teachers in Malawi and Madagascar had good and planned in-service training. According to Bennel [15], teaching and learning had improved in Malawi and Madagascar as a result of a well-planned curriculum guidance and support. In contrast teachers who lack in-service training may result to failures, such as teaching only components in the syllabus, which they are comfortable with [13]. As a result of this lack of curriculum implementation training, teachers remain incompetent in delivering quality education [16].

Teacher support and Motivation

Participants in Aloovi [4] study in Erongo Region in northern Namibia lamented the fact that there was lack of support from subject advisors and the school management teams. This lead to confusion and stress among teachers on how to implement the changes in the new curriculum in the teaching of Biology. Some teachers explained that they were on their own without any support from subject advisors and the school management team because they were not majoring in their respective area and as a result they were not knowledgeable in Biology. Some also complained of the fact that there was no support on the aspect of resources as their schools were under-resourced with lack of equipment like microscope and reagent. Due to this fact, teachers from this school had to use their own money to buy chemicals and reagents to conduct practical activities [2]. Some participants claimed that the head of departments (HODs) offered little or no support and in most cases left their works in the hands of the teachers because those HODs have no knowledge in the teachers' subject areas [7]. This lack of support for teachers affects the effective teaching and learning of Biology in the respective schools

Assessment policy

Researchers like Lebata and Mudau [1] have expressed the importance of assessment policy as a tool for successful teaching and learning. In his study, he found out that teachers understand what classroom assessment is all about. However, he found out that many teachers were not very informed on how assessment should be handled. For example test and quizzes were not given frequently by most teachers in order to check the learning progress of learners as required.

Assessment is an integral part of teaching and learning and teachers have the responsibility for identifying aspects of learning as it is developing, using both informal and formal processes, so that they, and the students can decide what to do next to enhance the learning. Assessment as learning, in particular, is founded on a belief that for students to become self-motivating and able to bring their talents and knowledge to bear on the decisions and problems that make up their lives. [17]

Given tests and quizzes to learners constantly is very important to understand the learners progress. When this is not done or when it is done for different purposes, both learners and teachers fail to meet their learning and teaching goals respectively.

Teaching methods

In a study by Katukula [17], he pointed out that while science teachers in Finland used the experimental teaching method in teaching their learners, science teachers in Sub-Saharan Africa used the small group method as a result of limited resources. The lack of knowledge about the teaching style in Biology affects academic performance of learners negatively. According to Lebata and Mudau [1], in teaching Biology, teachers used discovery, group discussion, lecturing, research and demonstration. He explained that some teachers could not use the experimentation teaching method due to lack of equipped laboratories at their schools and indeed that affected the teaching of Biology negatively as learners were not exposed to practical. More so, research study, done by Liswaniso [10] and Mawazo, [18] has pointed out that some Biology teachers use inappropriate and ineffective teaching methods, such as lecturing, copying material from notebooks and assessing their learners using factual questions, which leads to learners losing interest in their classes. It was also seen that some teachers used the lecture method and some were unable to apply different teaching methods due to certain factors, such as the lack of availability of chemicals, equipment and laboratories [19].

Teacher attitude towards the teaching of Biology

Research studies, carried out by Lebata and Mudau [1] in Losotho, show that there was a high rate of absenteeism among teachers leading to lack of commitment to their work. Even though teachers do take absent from school for various reasons, not much was done to call them to order and to make up for the lost periods. Another study by Mwoombola [20] found various reason relating to teacher absenteeism, which were as follow; death in the family, fabricated lies, tiredness due to long trimester, lack of commitment, stressful working conditions, attending workshops and examinations were some of the reasons teachers took absent from school. It was further seen, that some teachers may be present in school but will be absent in their classes or maybe present in their classes but will not be teaching on that day. Some researchers like Gbore and Daramola [21] also pointed out that some teachers showed unprofessional behaviour towards their work, such as the non-care attitude towards their learners. Gbore and Daramola [21] lamented on the fact that some teachers rather than teaching in their classrooms will instead sit down and engaged on other activities like being busy on their cell phones. This rate of absenteeism and the non-concentration of some teachers may lead to incompletion of the syllabus, distraction of learners and consequently learners' poor performance. Biology teachers must display in their daily activities the ethics of the teaching profession.

Class management and Learners' discipline

Upindi, Mushaandja and likando [22] pointed out that there has been a rampant breakdown of discipline, especially in Namibian secondary schools, due to the abolition of corporal punishment in Namibian schools. Other reports by Hope [23] and Zimba, Auala and Scott [24] show that certain issues, such as absenteeism with-

out valid reason, class-cutting, truancy; laziness, alcohol abuse, vandalism; theft of school properties and carrying of dangerous weapons on the school premises, were some of the challenges facing secondary schools in Namibia as learners have become unruly and uncontrollable and this has made teaching and learning in some schools impossible. Verner [25] and Burnett [26] also pointed out on the fact that teachers were subjected to stressful conditions due to the learners' behavior and overcrowded classrooms leading to poor classroom management for some teachers and this affected the teaching and learning of Biology.

Frequent curriculum changes

According to Amakali [27], most teachers are not qualified nor prepared to teach the new revised curriculum. "The curriculum has changed but it is the same teachers who are teaching, who were not given the proper in-service training in the new curriculum" [27]. "We need training on how to use modern technology to present our lessons. Changing the curriculum without proper teachers' training is a waste of taxpayers' money" [4]. In a report by the Namibian [28], some principals lamented that despite the shortage of textbooks, teachers have not been trained and they were not ready for the new curriculum.

Class sizes and teacher over workload

Research study, carried out in schools in Papua New Guinea on the impact of large classes on learners learning by Epri [29], pointed out that overcrowded classes lead to the teachers being overloaded with work, making it difficult for the teachers in marking and correcting the learners work. It was also noted in Epri [29] study, that teacher absenteeism, lack of support for weak learners and shortage of the teaching and learning resources could also be as a result of the overcrowded classrooms. As a result of this the classroom activities and the instructional techniques are negatively affected. Also, teachers have suffered from burnout from efforts of maintaining order in overcrowded classrooms [26].

Learner attitude towards learning Biology

Verner [25] and Lebata [1] have shown that some learners are not serious about their studies and they tended to disregard work, given to them by their teachers. The lack of learners discipline is a serious problem to the teacher as some leaners are uncontrollable and as a result are difficult to work with in class, which affects the teaching and learning of Biology. In other studies by Muyoyeta [30] and Mji and Makgot [31], it was shown that South African teachers still come across learners who are not serious with their studies. According to Muyoyeta [30], some learners show a negative attitude and no interest in Biology. It was also seen from this study, that some learners dislike their teachers, which led to these learners not attending those teachers' classes and not paying attention to the teacher when in class and disrespecting the teacher.

Challenges of teaching Biology conceptual Framework

Fig. 1 consists of the conceptual framework for teaching Biology for grades 11 and 12. These concepts include: Lack of resources, lack of well equip laboratories, lack of qualified and experienced teachers, lack of curriculum implementation training, lack of support and motivation, poor assessment policy, poor teaching methods, poor teachers and learners' attitude, poor class management and learners indiscipline and frequent curriculum changes.

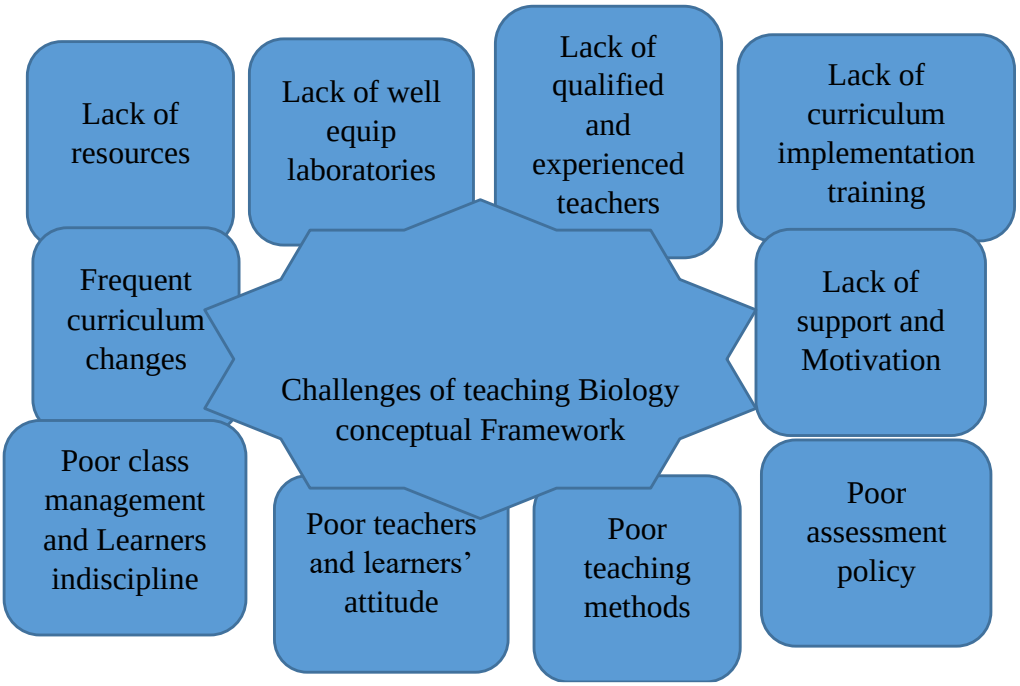

Fig. 1. Challenges of the teaching Biology conceptual Framework

The challenges of the teaching Biology conceptual framework consist of ten sub- themes and each of them has been explained in details above.

3. The purpose and the objective of the article

The aim of this research was to investigate the challenges, faced by grade 11 and 12 teachers in the teaching of Biology in selected schools in the Katima Mulilo Education Circuit in Namibia.

To accomplish the aim, the following task was set:

– To reviewed the relevant literature

– To interviewed Biology teachers to hear their views

– To gave some recommendations

4. Materials and methods

4. 1. Research Design

Creswell [32] and Christensen and Burke [33], define a research design as specific procedures, followed by a researcher in answering the research questions. These procedures involve the data collection, data analysis and the report writing. The research design shows the methods that the researchers used to collect data in order to answer the research questions and it further specify how the data is analyzed and interpreted. The researchers in this study used the qualitative research approach. People experiences and perspectives are commonly understood using this approach as it examines human choices and behaviors as they occur naturally without interrupting their natural flow [34]. The researchers selected this qualitative approach because it will be the best way to interview the teachers and get their views on the challenges that they are facing in the teaching of grade 11 and 12 Biology.

4. 2. Population

A research population is a group of individuals consisting of the same characteristics, in which the researcher is interested in and from which a sample is drawn [32, 35]. In this study the research population was Biology teachers and Heads of Science departments in senior secondary schools in the Katima Mulilo Education Circuit.

4. 3. Sample and Sampling procedure

A research sample is a subgroup of the target population that the researcher plans to study for the purpose of making generalization about the target population. According to Cohen, Manion, and Morrison [36], purposeful sampling is often used to access those who are knowledgeable to give in-depth information about a particular issue. Creswell [32] defines purposeful sampling as a method the researcher intentionally uses to select individuals who are knowledgeable about the issue under investigation in order to learn and understand the central problem. The sample for this study consisted of four grade 11 and 12 Biology teachers and two Heads of Departments (HODS) from two selected schools in the Katima Mulilo Education Circuit making a total of six participants. The participants were selected using purposeful sampling. This sampling method was used by the researchers because it enabled the researchers to select participants who were actually teaching Biology and the science HODs in the selected schools.

Permission to conduct this study was obtained from the Directorate of Education of the Zambezi Region of Namibia. The participants were given consent letters, which clearly stipulated that their identities and the name of their schools were not revealed. Before the interviews, the researchers also explained to the participants why they were carrying out the research, asked for permission from the participants to record the interviews and assured them of their confidentiality and anonymity.

4. 4. Data collection Methods

Two data collection methods were used by the researchers to collect data in this study. These data collection methods were interviews and observation.

Interview

Interviews are one of the most widely used data collection method by researchers in qualitative research. Interviews using open ended questions allow the researchers to get useful information as he/she is able to get into the mind of the participants in order to understand their views and perspectives on the subject matter [32]. In this study, the researchers used face-to-face interviews to collect the data. The interview guide consisted of six open ended questions. Interviews were used because they allowed the participants to give detailed information about the challenges facing the grade 11 and 12 teachers [36]. Using interviews as a data collection method in this study paved the way for the researchers to be more closed to the participants and this gave the researchers the chance to get an insight about the participants' views, feelings, experiences and attitudes concerning the topic of investigation [36]. More so, this also gave the researchers the opportunity to ask follow-up questions and probe for more clarifications [36].

Table 2

Biology teachers who participated in the study

Schools	Biology Teacher	Head of Department
A	2	1
B	2	1
Total	4	2

Table 2 above shows the number of participants in this research. Of the total of 6 participants, four were Biology teachers and two were the Head of Departments.

Observation

Observation is a process of collecting open ended first-hand information by observing people and places at a research site. It is a frequently used form of data collection with the researchers being able to assume different roles in the process [32]. Using this method gives the researchers the opportunity to record information as it occurs in the site and study the actual behavior of individual participants. Even though this data collection method has some disadvantages, such as limiting the researchers to those sites and situation that they might have gained valuable information and deception of some participants, it continues to be a well-accepted form of qualitative research data collection method. Using the

observation method, the researchers were able to observe and gather data about the participants and the activities that take place in the actual classroom teaching. According to Stake [33], the importance of using observation in a study is to increase the understanding of the classroom activities being studied by the researchers. In this study, two Biology lessons each from the selected schools were observed during normal class hours, from 07h00 to 13hoo. The aim of the lesson observation was to understand the challenges that these teachers faced in the teaching of Biology. The researchers' observation among others also took into consideration the physical environment, the teaching materials used, the classroom seating arrangement and the number of students in a class.

5. Results and discussion

5. 1. Challenges facing the grade 11 and 12 teachers in the teaching of Biology in selected schools in the Katima Mulilo Education Circuit

Availability/ unavailability of well-equipped laboratory

HOD1S1 explained that their main challenge is the lack of well-equipped laboratory. "Of course the building is there but it is just a classroom. So there is a classroom and two storerooms - no cupboards, no taps and no gas. What we are using are mobile gas burners" (HOD1 S1). Even though the HOD1 S1 believes that there are chemicals that can be used to demonstrate possibly more than fifty percent of the activities, required for the biology subject, T1 S1 believes that challenge number one is the equipment to do the experiments. She explained that Biology is a practical subject, which requires the use of experiments, but "We do not have enough equipment and for some experiments we don't have any equipment to carry out the objectives" (T1 S1). When asked about some examples of these experiments, she added that there is a lot like experiments for diffusion, osmosis, photosynthesis whereby it requires the use of aquatic plants, which are not available in schools. "We do not have chemicals to carry out those experiments, so we just have to skip them" (T1 S1). She explained that in such situations, they just explain in class theoretically and leave the practical.

This is a problem because the learners are unable to see and increase their creativity to understand the concept of the lesson. There are some experiments that teachers are not knowledgeable in carrying them out. We were not giving the training on how to carry out those experiments. (T1 S1)

HOD2 S2 also explained that carrying out practical by Biology teachers is a problem, coupled with the high number of learners in each class – some classes have about 60 learners in a class. A proper laboratory is another challenge that teachers are facing in the teaching of Biology (T1 S1). "This one is not a proper laboratory it is a classroom. It is a combine classroom and a laboratory at the same time and not a proper laboratory like in other schools. Some schools have a proper laboratory" (T1 S1).

This finding of the lack of well-equipped laboratory was similar to the findings of Lebata and Mudau [1] and Liswaniso [10]. According to Lebata and Mudau [1], well-equipped laboratories are very essential for effective teaching and learning in sciences. Learners with poorly equipped laboratories are bound to perform poorly as a result of not being able to relate the concept of the lesson taught. Liswaniso [10] also explained that some schools are lacking well-equipped laboratories and that some teachers even prepare worksheets for experiments only to discover in the laboratory that the required chemicals or apparatus to carry out their objectives are not available.

Lack of prescribed Biology textbooks

The second challenge is the lack of prescribed text books for Biology (HOD1 S1, T1 S1, T2 S1, HOD2 S2 & T1 S2). This lack of textbooks is very evident especially now that we have the new curriculum for the grade 11.

There are not enough textbooks. We don't have textbooks for each learner. Imagine having about 17 books for one grade, which is having more learners than that number. So, this is a challenge to us for example if you have an activity, which is classwork or homework, and the learners do not have textbooks, they may fail to complete their work or maybe sometimes you give a class activity and the work is in the textbook. It means learners will have to move around looking for where to sit, so that they can share a textbook. This can lead to the wastage of time. The time that they take to move around, that should be the time they should be sited doing their work and the time on the task is very limited. (T2 S1**).**

"We have enough textbooks for the old curriculum, but now that we have the new curriculum, for Biology subject textbooks are a challenge" (HOD1 S1).

T1 S1 also reiterated the fact that they do not have all the recommended textbooks at their school and the ones they are having are not enough for all the leaners. When asked on how many textbooks they receive from the ministry for Biology, she explained that for grade 10 and 11 for 2020, they were given less than fifty textbooks for both classes with a total number of learners of more than a hundred, and learners have to share.

According to T1 S1, learners are usually put in groups of 5, 6 or 7 sharing one textbook. "This makes it difficult for the learners to study well because there is no way these learners can really utilize these books well in this manner" (T1 S1). This problem is further aggravated by the fact that these learners do not live in the same area. This also affects the output of the learners.

T2 S1 also emphasized on this problem of lack of textbooks because learners need them to study. With available textbooks learners do not need to wait for the teacher to come and give them summaries again.

Most of African countries including Namibia, especially the Zambezi Region, lack materials in schools and the library in their school is ill-equipped with materials to handle the needs of the learners as the curriculum of the ministry of basic education stipulates.(HOD2 S2)

Another major challenge according to HOD2 S2 is the limited availability of textbooks to learners. For example for our new curriculum, fifteen textbooks were given to a class of two hundred and sixty learners. This leads us to a challenge of how to share these limited textbooks to the learners. "We cannot duplicate these limited textbooks because copyright does not allow it.

This finding of lack of appropriate or prescribed textbooks is similar to the finding of other researchers like Angula [7], Mwangu and Sibanda [3], Colen [9]. While Angula [7] lamented on the impact of textbooks lack and that no meaningful teaching can take place, Lebata and Mudau [1] has also explained that there is a shortage of textbooks for learners. According to him, parents are not doing their responsibilities as it is required. He further explained that text books are very vital in the learning of Biology. "The absence of textbooks affects Biology performance negatively, since learners depend on notes alone. The notes themselves are never adequate" [1].

The challenge of large Biology syllabus content

T1 S1 explains the Biology syllabus is too long. According to her, she is overloaded.

I have been given a lot of periods and the content is too much. Because of this, I do not give quality work to the learners because of limited time for marking. One is ever rushing to finish the syllabus. I don't have enough administrative periods to do the marking, setting and writing worksheets. As a result of this my learners' performance in Biology is affected. Even when you try to give quality work like in those questions of explaining, describing, you find that there is no time for marking. This pushes you to give short questions, which are very easy to mark. (T1S1)

The long Biology syllabus content is also emphasized by T1 S2. He explains that Biology syllabus is too much.

There are almost 195 basic competences in the syllabus, and from the same syllabus there are almost also a hundred and something competences for practical. If you combine the two, you will find that it is a heavy load to do. Teachers have to teach two syllabuses if I may just put it. For the content hundred and ninety something competences, and hundred and something suggested practical, which is too much (T1 S2).

The finding of large Biology syllabus content was also similar to that of Lebata [1]. According his study in Losotho, the Biology syllabus was too lengthy and as such it was difficult for teachers to finish and this hinders successful teaching and learning.

The challenge of overcrowded classrooms

Classes are overcrowded as a result from the downgrading of many senior secondary schools to junior secondary schools. Even though some of the junior secondary schools were upgraded, they are not enough.

Even if they are enough, they are not in town. We still see parents who want their children to attend schools in town. As a result we have a huge volume of influx of learners going into a certain school and few going to rural schools. I think the issue of urbanization contributes to the overcrowding of schools in town like ours. This has led to an unprecedented number of learners in each class at the moment. We have been to the regional office many times, to complain to the Inspector of Education about the overcrowding nature of our classrooms and to request for support, but the advice we received was that we should try to accommodate those learners (HOD2 S2).

How can you teach a class of sixty! In the case of grade 12, you are teaching two or three classes in one - the classes are overcrowded. In most cases we teach just standing at the door, you cannot even move around and you know some of the learners need the teacher to be by their side and help them, but with these overcrowded classes, there is no way you can help these learners (T1 S2).

T1 S1 and HOD2 S2 agreed that overcrowding classrooms exist in their schools and is a challenge. T1 S1 explained that grade 12B is made up of 43 learners. "I am unable to have a one on one interaction with the learners and this aspect hinders the progress of some learners leading to them not performing well in Biology" (T1 S1). T1 S2 also explained that overcrowded classrooms have led to classroom management problem. According to him, it is very difficult to control the learners in large classes.

The above finding was similar to those of Yaman and Uygulamada [35]. In their study they found that overcrowded classroom conditions hinder teachers' attention to individual students and slows down the progress of students' learning.

Teachers had limited time to focus on the needs of slow learners and were forced to neglect them to keep pace with the prescribe time allocation for each learning area. In large classes, one to one attention on students means that teachers spend a certain amount of time with each learner [29].

Learner's poor assessment and commitment

They are more learners in our classes. T2 S1 expanded on learners' poor assessment by touching other challenges.

Imagine if you have more than forty-five learners in one class, in sciences that is a big number. With the limited resources like textbooks, this can be a very big problem. Imagine going to the laboratory for assessment and we do not have a big laboratory. When using a microscope for example, learners will have to share one microscope and it affects learners because they have to give turns to each other to use the microscope. This is a problem for big classes and a challenge for assessment (T2 S2).

She further explained that sometimes one comes across some of these learners who are not focus and committed. They lack commitment to their school work. Imagine grade 11 and 12 learners given homework, and they come back without doing such work. This shows that they are not serious with their school work. There is no way a child or learner can pass if they do not have time for their school work (T2 S2).

Commitment, of course learners need to do their work because it is from their work that the teacher is able to identify if such a learner does understand the content that he/she is given. It is from the homework or class activities that the teacher is able to find out if a learner is progressing or not. When there is a class activity or assessment, coupled with the problem of few textbooks, it is a challenge to carry out effectively. For example when learners have to share a textbook for a class assessment or activity as explained above, learners have to move around looking for where to sit, so that they can do the activity. Such movement can also lead to poor classroom

management as a result of noise making. Learners may even take chances to copy from each other and this make it hard to identify learners who actually need help (T2 S1).

With assessment, a teacher cannot come up with a task that goes up to a hundred marks in a big class because it will take long to mark. When giving task you limit on the number of questions. For example in a class of 12 you can give a task of 50 marks, but you cannot give to a class of 50 learners the same task (T2 S2).

HOD2 S2 expanded on the above point by explaining that marking such a huge number of learners' scripts, or activities, or whatever practical they have is a problem.

For example, if I have seventy learners in a class and I have to assess them and the same time am expected to give feedback to them by tomorrow and couple with the administrative work I have at school, it is going to take a draw on me. The time to give feedbacks to learners is delay because of this (HOD2 S2).

T1 S1 was very explicit on her views on assessment. "We are not giving quality work, due to overloading and overcrowding. I do not give tests to my learners often because there is no time for marking. Even when I give, I take it from the easiest objectives".

HOD2 S2 is of the opinion that if you make an educator to be unhappy in any form of either mental strain or physical strain they are drained and will not work anymore. They will not perform. To mark many scripts at a short period of time. "For example during examinations, teachers are more stressful and it is not good for their health. Remember they are train to teach thirty-five learner per class, not double that number – they are humans" (HOD2 S2).

The above finding was also similar to that of Lebata and Mudau [1] and Epri [29]. In Lebata and Mudau [1] study, he found that even though teachers understood what good classroom assessment was all about, they were not doing it because of time constraint and overloaded subject content.

I do not know how well they are learning and understanding what I am teaching. Due to time constraints, I have to move on with lessons and my topics of teaching. Those slow learners are left behind and that is where majority are.

I get confused whether students learn or not because it is hard to monitor their progress. If they do not understand, I am sorry but I move on for the ones that had learnt, otherwise slow learners drag us down and we will be late with completing our units [29].

New curriculum implementation challenge

Some of the objectives for the current syllabus for Grade 10 and 11 were taken from the higher level syllabus, so it is difficult for learners to understand because the level is high for them. It is not like the old curriculum, so the learners have a lot of problems in understanding this new curriculum. Even the learners' thinking is too slow. It is like they are lacking the basic concepts and are too young for the content. Also for grade 10 and 11 the objectives for the theory and the practical are mixed up. With the old curriculum, first you have the objectives for the theory and objectives for suggested practical. Now that the things are just mixed, you cannot tell that this one is for the practical and this one is for the theory. There is confusion. In the old curriculum, it was very clear. Sometimes under the objectives of the theory you are required to do the practical but at least we were given objectives for the practical. And normally when they set paper 3, they take from the objectives of practical. It was easy to know you have covered this practical but now that the things are just mixed up, you don't know if a teacher should give a practical or a theory.

When ask if teachers were trained for the new curriculum, T1 S1, T1 S2, T2 S2 and T2 S1 responded that they were given training at the regional level, but the training was just on some of the topics and did not involve all the topics.

I did not benefit much from it. The training was more on the theory and no practical. There were no experience teachers to really explain certain things. Some of the questions were not even attended to and the training lasted for three days only (T2 S1).

T2 S1 views were a bite different from T1 S1. T2 S1 explained that because the duration for the training was only for three days, topics that teachers thought could be a challenge were identified for the training. Also, practical were carried out for example on how to prepare wet slides. The trainers brought in microscopes, so teachers could also prepare their slides and view them using the microscopes.

T2 S1 says that the challenge with the new curriculum is that the resources come late. It's not always that you get your textbooks in January, if you do, you would have just a few of them. "The new curriculum comes with new topics that one is not used to, but that is why workshops were carried out before we started with this new curriculum" (T2 S1). She continued that the last workshop was carried out in 2018. "The training is no longer often as it used to be, because the ministry is reducing funding because of the economic crises" (HOD2 S2).

The above finding of the challenge of the new curriculum implementation was similar to the findings of Moalosi and Molwane [13]. They found that teachers received little training on the implementation of the curriculum. Some participants expressed the view that the training they received was inadequate for them to implement the curriculum effectively.

Poor learner's attitude

Learners' attitude was also identified as a major challenge. According to HOD2 S2, the learners turn to take Biology as a new subject at grade 11 and therefore they throw away the subject, which was linked to it. To them, everything they are going to do is new and as a result, they have negligent to master the content and that negligent surely affects their results. Learners have no aspiring approach from one grade to the next grade in terms of Biology itself. Indiscipline among learners is another challenge it can make teachers to feel uncomfortable (HOD2 S2).

T2 S2 believes that his learners like Biology. According to him, when a teacher is teaching, the learners will seem to understand and some are motivated because

they like Biology, but when it comes to examination, it is a problem. “They don’t know how to answer the questions” (T2 S2).

Some learners do not like Biology, because they complain of the content being too much. Some even say the subject is boring. At times, when you are teaching, some will be sleeping. Some are not interested at all and at such develop a negative attitude towards the subject (T1 S1).

Learners’ attitude is also viewed by T2 S1 as mixed. She believes that the learners are generally positive although there are some with poor attitude. Learners with positive attitude are always ready to do their work. When they are given a task, they do not waste time. For those with negative attitude, they usually go around aimlessly wasting time

T1 S1 explained that learners’ indiscipline was a problem. According to her, some of the boys come into the school drunk and some are even smoking marijuana. Another challenge is learners’ pregnancy. There is a high degree of pregnancy in the school, which is becoming unbearable to the teachers. It is sad to see learners as young as grade eight getting pregnant.

I feel that some of these laws, which were reviewed to allow learners to continue learning while pregnant are good, but they have opened a loophole for these learners to indulged in more sexual activities apart from education. This is creating a problem to male teachers. In some cases, female learners take unwanted moves toward male teachers. They do not look at the male teachers as their guidance or parents who are there to educate them, but instead see them as partners who can satisfy their needs. (HOD2 S2)

These learners take absence from school three weeks before delivery and after delivery if they are not in good health. This absenteeism hinders their learning and poses a problem to the teacher in completing the syllabus (HOD2 S2).

The above finding was also similar to that of Upindi, Mushaandja and Likando [22] and Zimba, Auala and Scott [24]. In their study, they expressed their view on the breakdown of discipline in Namibian schools due to the abolition of corporal punishment. Others like Hope [23] and Zimba, Auala and Scott [24] and Lebata and Mudau [1] were even more critical explaining that learners have become unruly and uncontrollable in schools and this made teaching difficult and has affected both learners and teachers. They also pointed out that the rate of alcohol abuse, laziness and truancy have increased. In a study by Matlala, Nolte and Temane [37], teachers reported that they lack skills to meet the health needs of pregnant learners in their schools and they see these pregnant learners as a burden.

Lack of motivation and support

According to T2 S1, there is support and motivation from HOD and the principal. With the limited resources they have, they are supportive. She explained that she was told she could ask for support when need be. “One can approach them for any problem or challenge that you have and they will look at it with emergency” (T2 S1).

T1 S1 also explained that it is always very fortunate to be more than one teacher teaching a subject. When you find yourself when you are two, then you are very fortunate. When she faces any difficulty, she does not shy away. She approaches another colleague in the subject to explain. “They are always willing to help” (T1 S1). T1 S2 also explained that when they need something, they consult their head of Department for support. This support usually comes when possible. However, sometimes the money from the government comes late. For example, when they started with this new system, money usually comes in April or May (T1 S2). At the regional level teachers come together and make summaries and handouts that are duplicated and given to the learners (T2 S2). While T2 S2 acknowledged getting support even from the University of Namibia (UNAM), T1 S1 revealed that they are usually given trophies and certificates for excellent work with a score of 65 % for schools and external examinations.

The finding of the lack of support and motivation was not similar to those of Aloovi [4] and Angula [7]. According to them, the teachers’ complaint was that they were not given the necessary support from the management and the subject heads, and one of the reasons was that some of the subject heads did not major in the teacher’s area and as a consequent the subject head had little to contribute in helping the teachers.

Teachers’ qualification and experience

All the interviewees said all their Biology teachers were qualified. HOD1 S1 said a degree is required to teach in senior secondary schools in Namibia but in some cases teachers with Basic Education Teachers Diploma (BTD) and post-graduate diploma specializing in various subjects are qualified to teach in the Namibian system. He also explained that opportunities to upgrade for science teachers are minimum and very challenging in Namibia. Distance studies in science subjects are a bit challenging. Like Mrs X has been doing her degree through UNAM and it takes six years. Six years because a basic honors degree is four years full time but Part time is six years. She usually goes for classes and this jeopardizes the learners as they are left with no teacher.

Table 3

Teachers’ qualification and experience

Teachers	Qualification	Teaching Experience (years)
HOD1 S1	BA Honor Degree	20
T1 S1	BA Honors Degree	7
T2 S1	BA Honors Degree	3
HOD2 S2	BA Honor Degree	16
T1 S2	Masters’ Degree	19
T2 S2	BA Honors Degree	16

Table 3 shows the teachers qualification and their teaching experience. All the teachers have a Bachelor’s degree and one has a Master’s Degree. Teachers with the highest teaching experience include two teachers with 16 years experiences, and two teachers with 19 and

20 years of experience. There are only two teachers with limited years of teaching experience: one has three years and the other has 7 years.

Even though the Biology teachers are all qualified, HOD2 S2 further explained it is not the case with all subject teachers. He explained that there has been a position for Physics and Chemistry for quite some time with no available candidate. These vacancies have been there since 2007. "When teachers go for study leave, temporal teachers are recruited to replace them" (T2 S2).

HOD1 S1 explained that his teachers are experienced. He cited Mrs X who has been teaching Biology grade 11 and 12 higher level for many years. HOD2 S2 also commented on the experience of his teachers. He says that his teachers are well qualified and experienced like T1S2 who has a Masters' Degree. While T1 S2 explained that he has been teaching for 19 years, T2 S2 also explained that he has been teaching for 16 years.

The challenge to the teaching methods

Teachers sometimes use a learner-centered teaching approach. Teachers use handouts, overhead projectors (OHP) and transparencies. Most of the teachers relied on the lecture method, due to the time factor. If you really follow that learner-center approach, you will not be able to complete the syllabus in the stipulated period of time. Teachers are forced to use the teacher-centered approach. OHP are there. T1 S1 also agreed that some teachers are using the learner-centered approach. This includes learners working in groups, question and answer methods among others. Some teachers used technologies like the projector. However, there is a problem of lack of electricity connectivity in some classrooms, and as a result some teachers have followed the teacher-centered approach. She further explained that if her classroom had electricity she would have projected a video on how the human heart functions in blood circulation in the body rather than just explaining. T2 S2 added that teachers use proper teaching methods. For example, teachers used the demonstration method to carry out experiments in the laboratory.

Liswaniso [10] pointed out in his study that some Biology teachers use inappropriate teaching methods like just lecturing and dumping copied materials on the learners in their classes and this has led to some learners losing interest, especially in science subjects. Aloovi [4] has suggested that the department of education should think long term and look for solutions to improve or to handle this teaching method challenge.

Poor or lack of internet connectivity

Internet connectivity is a problem in both schools. HOD1 S1 lamented that if they had internet connectivity teachers would have use You-Tube videos to supplement their teaching. T2 S1 explained that some teachers have resulted to using their cell phones due to the lack of internet. When ask if there is an ICT laboratory in the school T2 S1replied that she thinks there is a computer laboratory but it is not functional. T1 S1 also supported the view that there is a non-functional ICT laboratory in their school. It is a problem because teachers are unable to research more work to help their learners when they are in school.

The above findings are also similar to those by Tjitemisa [38]. In his publication, he pointed out that closed to 70 % of Namibian government schools were still without internet connection. He reported that the Deputy Minister of Education has acknowledged the challenge.

Lack of well-equipped libraries

There is a library but there are no textbooks. It is not a proper library. It's just like a small classroom without computers. In fact it is small and not equipped. It is also a challenge to the teachers because we cannot give quality work to the learners. "For example, if you give questions to learners to research, they are no textbooks in the library, and the learners do not have smartphones to search from and do their assignments" (T1 S1).

The school has a library, but that is not the kind of library where you can sit and study. It is a small library and poorly equipped with no textbooks. The last time I ask the learners to go to the library, they were like which library! (T2 S1).

The above findings were also similar to those of Nengomasha, Uutoni and Yule [39]. They have argued that school libraries have outdated content and are poorly resourced, leading to poor usage by learners and teachers. They suggested that more books and computers should be bought and modern libraries should be built and equipped with internet connections.

Limitations of the study. The first limitation of this study is institutional as it was limited only to two selected schools in the Katima Mulilo Education Circuit in the Zambezi Region. It does not cover all the schools that are needed for generalization to take place in the Katima Mulilo Education Circuit in the Zambezi Region. The second limitation is due to the cost. If the research was to be conducted in all the schools in the Katima Mulilo Education Circuit in the Zambezi Region, it would have been more costly to the researchers to travel to those schools to collect the data. It was due to this financial limitation that the researchers decided to conduct the study only in two selected schools.

Suggestions for further research. Further studies should be done for all the senior secondary schools in the Zambezi Region and in the other regions of Namibia on the challenges, faced by the grade 11 and 12 teachers in the teaching of Biology.

Recommendations:

– The Ministry of Education should build modern libraries and equip them with computers and internet connectivity, textbooks, and e-learning tools to help learners and teachers inculcate a culture of reading and studying.

– Teachers should introduce shared personal practice, and collective learning and application as used in professional learning communities [40].

– Teachers should organize weekend and holiday classes to complete the long Biology syllabus content.

6. Conclusions

The findings were in conformity with the theory and were as follows:

1. Unavailability of well-equipped laboratories
2. Lack of prescribed Biology textbooks
3. The challenge of large Biology syllabus content
4. The challenge of overcrowded classrooms
5. New curriculum implementation challenge
6. Poor learner's attitude
7. Lack of motivation and support
8. Poor or lack of internet connectivity
9. Lack of well-equipped libraries

6. 1. The long Biology syllabus content

Another new finding was the challenge of the long Biology syllabus content. Some participants in this study complained that the Biology syllabus content was too much to be completed within the stipulated time. According to them, in order to complete this syllabus within the stipulated time, they have rush most of their teachings and set easier and limited assessments.

6. 2. Teachers' qualification and experience was not a challenge

This study also uncovered the finding of teachers' qualification and experience as not being a challenge. All the participants expressed the view that they were qualified and experienced. It should be noted that only one of the participants had a Masters' Degree, and another teacher was doing her Master's Degree. The rest had only Bachelor's Degree that qualifies them to teach.

Conflict of interest

The authors declare that they have no conflict of interest in relation to this research, whether financial, personal, authorship or otherwise, that could affect the research and its results, presented in this article.

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Data availability

Manuscript has associated data in a data repository

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Mirabel Moakong Ayiawung, Post Graduate Diploma in Education, Zambezi Region, Namibia

Dingindawo Ncube, PhD, Department of Education, Zimbabwe Open University, 429 Soudan str., Show Grounds, Gwanda, Zimbabwe, Box 346

David Nkengbeza*, PhD, Department of Applied Educational Science, University of Namibia, Katima Mulilo, Namibia, 1096

***Corresponding author:** David Nkengbeza, e-mail: dnkengbeza@unam.na*