Exploration of teachers' experiences in teaching Agricultural Sciences with limited resources in the Mankweng Circuit, Limpopo Province

Mmapake Florence Masha & Kgaladi Maphutha
University of Limpopo Department of Mathematics, Science and Technology Education
Corresponding author: kgaladi.maphutha@ul.ac.za

ABSTRACT

Teaching and learning resources are key factors that enable the teacher to effectively deliver a lesson. In Agricultural Sciences, schools should have Agricultural Sciences laboratories, small farms, and school gardens for effective teaching of the subject. The study explored Mankweng Circuit teachers' experiences regarding teaching with limited resources in Agricultural Sciences. This qualitative study used phenomenology as a research design. An interview protocol containing open-ended questions was given to three teachers who teach at three different secondary schools in the Mankweng Circuit. These teachers were asked to outline their experiences regarding how they taught with limited resources. Groenewald's explicitation process was used to analyse the data. The findings revealed that, the lesson objectives were at times not achieved due to limited resources. The study further observed that teachers often resorted to the traditional teaching approach which leads to learners not to understand the basic concepts of the lesson. It was also observed that novice teachers become demotivated by the limited or lack of resources whereas experienced teachers can improvise with limited resources. This study recommends that all stakeholders should assist schools with teaching and learning resources to improve efficiency of teaching in Agricultural sciences classrooms. Teachers should be trained to improvise on teaching and learning resources where possible.

Keywords: Teachers' experiences, limited resources, Agricultural Sciences, Mankweng circuit, Groenewald's explicitation process

INTRODUCTION

The availability of teaching and learning resources is one of the prominent challenges facing South African schools. This challenge tends to impede on the effective delivery of lessons in class. This is more evident in vocational subjects like Agricultural Sciences where the transfer of physical skills to learners is a necessity (Mbajiorgu et al., 2014). The Curriculum and Assessment Policy Statement (CAPS) highlights that for schools to offer Agricultural Sciences subjects they should be provided with textbooks and Agricultural Science laboratories (DBE, 2011). This is intended to prepare learners to further their education and to become farmers. However, this prospect seems impossible due to inadequate teaching and learning resources in schools. Agricultural Sciences subjects have the potential to provide learners with entrepreneurial skills for self-employment and self-reliance. However, acquisition of these critical skills requires that learners be exposed to practical work. Ndem and Akubue (2016) emphasise that learners of Agricultural Sciences need to learn how to efficiently produce crops and rear animals. The success of learning these skills solely depends on the presentation of both practical and theoretical elements of the subjects.

In view of the above arguments, some scholars have alluded that teaching of Agricultural Sciences is difficult if required resources of facilitating learning are not available (Ibrahim, 2011; Ikeoji, Agwubike & Disi, 2007). This confirms that the teaching of Agricultural Sciences in schools

is clouded by many difficulties due to lack of support from the government in supplying teaching and learning resources for the vocational Agricultural Sciences. This challenge is exacerbated by inadequate capacity from the teachers in improvising in their teaching of the subject (Lambert, Velez & Elliott, 2014).

The lack of teaching resources in schools results in poor delivery of the subject. Teachers are obliged to use traditional method of assessment such as a test, assignment of which inhibited teachers from the new development in teaching of Agricultural Sciences (Ikeoji, Agwubike & Disi, 2007). Akubue and Ndem (2016) further emphasise that the problem facing the poorly resourced schools should be attended to, to avoid straying away from the purpose of vocational subjects. This is likely to increase the problem of learners' lack of relevant Agricultural skills.

Basically, this entails an interplay between availability of teaching and learning resources in our schools and the type of learning the learners are likely to receive at end of the programme. It is against this background that this study intends to explore teachers' experiences in teaching Agricultural Sciences with limited resources at Mankweng Circuit within the Capricorn District, Limpopo Province.

RESEARCH QUESTION

The study was set out to respond to the following research question.

What are the teachers' experiences in teaching Agricultural Sciences with limited resources?

PROBLEM STATEMENT

As one of the vocational subjects offered in South African schools, Agricultural Sciences requires a provision of learning technical equipment and resources. The Curriculum and Assessment Policy Statement (CAPS) for agricultural sciences stipulates that for schools to offer this subject they should have relevant textbooks and an agricultural laboratory. This is because the use of these resources in the teaching of Agricultural Sciences will help the teacher to deliver lessons efficiently. However, Kabugi (2013) found out that most schools that that offer Agricultural Sciences continue to have inadequate resources such as agricultural laboratories, livestock units, agricultural tools, and agricultural land. Subsequently, Aholi, Konyango, and Kibett, (2018) posit that the lack of sufficient learning resources for Agricultural Sciences makes it difficult for learners to acquire the relevant skills needed in the agricultural sector. This is owed to the fact that most learners struggle to learn topics such as farm equipment, agricultural economics and animal science due to lack of resources. This results in schools producing students who are unable to participate actively in the economy. Hence, the lack of resources in schools derails effective instructional delivery of Agricultural Sciences subject.

LITERATURE REVIEW

Impact of limited resources on the teaching and learning of Agricultural Sciences

Several authors have emphasised the need for teaching and learning resources for effective delivery of Agricultural Sciences in schools. Ibrahim (2011) highlights that experience and qualification of the teacher influences how the teacher uses instructional materials to enhance learners' learning. This brings us to the fact that teacher training programmes should include training teachers on how to improvise in resource poor schools. Furthermore, utilisation of little resources available may remedy the problem faced by schools if Agricultural Sciences

teachers are provided with in-service training.

Darko, Offei- Ansah, Shouqi and Jun-ping (2015) indicated that lack of resources leads to teachers frequently using the lecture method. This method does not have the capacity to instil Agricultural Sciences skills among learners. Relevant pedagogy affords learners an opportunity to easily understand important scientific concepts. The lecture method tends to encourage learners to memorise concepts that need analytical thinking. The use of teaching and learning resources helps the teacher to impart active learning in the classroom. Therefore, learners become motivated and eager to learn. The unavailability of school farms and laboratories in schools leads to unrealistic and dull Agricultural Science lessons (Bilgin, 2006). Darko et al. (2016) confirm that lack of important teaching resources in Agricultural Sciences such as demonstration plots, laboratory, school farm, animal farm, impedes the teaching of the subject. This type of situation inhibits the achievement of learning outcomes and immensely affects the performance of the learners in schools. Mupa, and Isaac-Chinooneka, (2019) maintain learners' performance will continue to be affected because teachers' instructional materials are limited to textbooks and syllabuses only. As a result, some of the learning activities are scraped out of the teaching plan.

Inadequate supply of the teaching and learning resources in schools compromise the quality of the education learners receive. Subjects like Agricultural Sciences are capable of developing learners to be self-reliant citizens. Hence, it is important that the subject be taught as a vocational course (Olajide, Odoma, Okechukwu, Nare & Okhaimon, 2015). In addition, Waithera (2013) notes that lack of land in schools also creates challenges in the teaching of agricultural sciences. Some schools have teaching and learning resources, but they are unable to utilize them due to lack of Agricultural Land.

Instructional material plays an important role in helping learners to understand the dynamics of a subject. There are some processes that are difficult to understand when explained in abstract terms. As such, the use of instructional materials such as audio-visuals assist in explaining these abstract terms better for leaners (Alkali, Ikehi & Okene, 2016). Smeds, Jeronen and Kurppa (2015) confirm that learners learn better in an authentic learning environment. An authentic learning environment gives learners a first-hand experience. It is much easier for learners to relate to the content in an authentic learning environment because it supports learners to understand the basic concepts in the subject.

Muchena (2013) notes that the teaching of Agricultural Sciences in schools involves the use of farm machinery and livestock tools. However, the major setback is that schools are only able to provide a small fraction of agricultural resources such as agricultural charts, seeds, chickens and other small simple farm tools. The situation is exacerbated by improper distribution of funds in schools (Maffea, 2020).

THEORETICAL FRAMEWORK

The study was framed on the Mitzel (1969) model which highlights that teaching encompasses interaction between the following variables: teachers and students, their interactions, and the product of those interactions. The model was expanded by Dunkin and Biddle (1974) to include four variables which are the presage, context, process and product. According to Clarke and Peterson (1986), the presage variable consists of all teacher experiences which could be formative (teacher background, personality,

etc) and teacher training (teacher education training) and their personal attributes. The participant teachers in this study did Agricultural sciences at their high school level and have been trained as Agricultural science teachers in the Bachelor of Education programme. The context variable includes the learner factor (learner's attitude, motivation, interest, and proficiency level) and the learning environment (the setting in which teaching, and learning takes place). In this study, learners motivated themselves and chose to do Agricultural Sciences on their own in Grade 10 where they are given an opportunity to select streams. Teaching and learning happen in the classroom at the school which lacks or has limited resources. Process variables refer to all the actual teaching and learning activities in the classroom (interactions between the teacher and the learner) (Dunkin & Biddle,1974). The product variables are the ones that deal with the outcomes of the process variables (Mitzel, 1969). In this study the intention was to explore the Agricultural Sciences teachers' experiences of how the context, process and the product are affected by limited or absence of resources. Therefore, this study was set out to explore teachers' experiences in teaching Agricultural Sciences with limited resources in the Mankweng Circuit, Limpopo Province.

RESEARCH METHODOLOGY

This study followed the qualitative approach utilising the phenomenological design, underpinned by interpretivism. Interpretative paradigm is based on meaning oriented methodologies. This implies that data are gathered through interviews and observation (Reeve & Hedberg, 2003). This paradigm aims to clarify the subjective meaning and reason that lie behind a social action (Kaplan & Maxwell, 1994). Hence in the context of this study qualitative approach was found suitable as the interest was on gaining in-depth understanding of teachers' experiences of teaching Agricultural sciences with limited or no resources in their classes as their natural settings (Creswell & Poth, 2013). Three Agricultural Sciences teachers who were purposefully selected due to teaching Agricultural Sciences at three different under-resourced secondary schools in the Mankweng Circuit participated in the study. These teachers were teaching Agricultural Sciences from Grade 10 to 12. Their experiences of teaching ranges from two years to twenty years. The teachers were interviewed at their schools using open-ended questions which probed their experiences regarding teaching with limited or without resources. All the questions revolved around the central question which the participants were asked. The question was: Briefly describe your experiences of teaching in an under resourced environment. How does that affect the teaching and learning of agricultural Science in your class?

In order to adhere to confidentiality and anonymity, the names of the teachers and the schools are withheld. The data gathered from the interviews were audio recorded, transcribed and analysed through Groenewald's (2004) explicitation process which comprise of the following five steps:

1. Bracketing and phenomenological reduction – all our views, experiences, biases, beliefs and preconceptions about the phenomenon during the interviews and during the analysis process were suspended.

2. Delineating units of meaning – we repeatedly listened to the audio recording of each interview so as to capture all the information provided by teachers and extract important statements from each interview and also to carefully remove unwanted pieces through a process called horizontalization (Moustakas, 1994).

3. Clustering of units of meaning to form themes – categories which were then clustered together to form themes were formed from the remaining horizontalized non-redundant statements (Creswell & Poth, 2013).

4. Summarise each interview, validate and modify - all themes were summarised, and member checking was done by returning to each participant to check if the core of the interview has been properly captured (Groenewald, 2004).

5. General and unique themes for all the interviews and composite summary - common themes were presented as the results of this study (McMillan & Schumacher, 2010).

Participants were ensured of anonymity; hence codes were used for the schools and the teachers throughout the study.

RESULTS AND DISCUSSION

The curriculum objectives are at times not achieved due to limited resources

The unavailability of resources in schools put teachers in an awkward position. Some of the assessment activities which should be done by the learners requires them to do projects as part of imparting farming skills among learners. The success of the projects depends on the availability of the resources. Teachers end up scrapping out the activities from their teaching plan as result of lack of the necessary resources. This implies that not all the learning objectives will be achieved in these poorly resourced schools. Teacher B said the following:

Some of the assessment(s) requires practical work, which the school don't (does not) have the equipment (to carry them out). This result in schools not doing (administering) all the assessment in the CAPS documents.

Lack of or limited resources lead to learners not learning effectively. According to Dunkin and Biddle (1974) if the process variables are not well implemented then the product variables will be affected negatively. Therefore, according to the participants, effective teaching in Agriculture is hindered by lack of resources and as such learning outcomes are at times not achieved and this leads to poor performance in the subject. Lack of resources result in learners not having all the necessary foundation skills and knowledge needed to further their studies in tertiary schools. Learners from these schools fail to adjust to varsity teaching methods because they start to experience things for the first time in the higher institutions. Teacher C indicated that, *"with no resources, learners never learn to their full potential"***.** These results are in line with those of Olajide et al (2015) who highlighted that it is important that a subject like Agricultural Sciences be taught as a vocational subject so that learners can learn to their full potential. The study further maintains that this type of teaching will produce learners who are self-reliant and self-employed in stagnant economy.

Teachers often resort to the traditional teaching approach which leads to learners not understanding basic concepts of the lesson

The findings of this study indicated that teachers experience difficulties in teaching Agricultural sciences without resources. Teacher A showed that in almost all his lessons he resorted to preparing learners for tests and examinations. He indicated that

> Since we do not have resources here at school I try to "practicalise" the subject to the best of my ability by telling them what they are supposed to know for examination. All my lessons are prepared and taught the same way

> regardless of the topic because there is nothing, I can do rather than teaching that way.

Teacher A further related his experiences as follows:

> the level of interaction in the classroom is very poor as it is always me who does the talking and at sometimes (times), I pause the lesson and encourage my learners to visualise what I am talking about. This also becomes difficult to learners to picture out something they had never seen in their minds.

Teacher B went through the same experience as Teacher A. He indicated that,

> In my class learners do not always participate, they are always expecting me to explain everything to them. I do not blame them because how would they be active whereas the teaching and learning dictates to them to listen and be attentive.

It is much easier for learning to occur if learners can prepare for the class in advance. However, this is often impeded by the lack of textbooks in the schools. Teacher C alluded that, *"learners lose interest as there is no direction of what they are being taught"*. This concurs with the study by Bilgin (2006) which noted that a class where all the learners are not hands on and do not have textbooks makes learning and teaching difficult for both the teacher and learner. The actual process of teaching and learning become dull and unrealistic. This forces teachers to read for learners' word by word, consequently consuming the teaching and learning time. This has a negative effect on the type of learning learners receive in the schools. Gardner's theory (2011) notes with caution that teachers need to acknowledge the uniqueness of each learner's intelligent and act accordingly. This type of learning environment hinders the teaching process (process variable) and does not provoke learners' interest to learn. This signifies that teachers need to employ different teaching and assessment methods to accommodate the learners. However, such propositions are impossible due to limited essential resources. Teacher A maintained that *"the availability of the resource dictate how one should do the teaching and how learners should learn"*.

Novice teachers become demotivated by the limited or lack of resources whereas experienced teachers can improvise with limited resources

The result indicates that teachers with more experience are more likely to cope with the challenges of resources in schools. Throughout their years of teaching, they would have developed the techniques of teaching Agricultural Sciences in the best possible ways. Teacher A highlighted the following:

> It is the responsibility of the teachers to gather at least their resources so that their preparations will be effective. Well, when going to class I make sure that I prepare thoroughly by looking for the best possible resources that I can access at my very own expense such as printing pictures, preparing case studies and gather graphical data where necessary to present to my learners. Additionally, I would watch some videos on YouTube and use various textbooks for better teaching to the learners that will enable learners to understand easily.

The lack of resources in schools creates more frustrations on the novice teacher who is willing to make a difference in the society through imparting knowledge to learners. These teachers through their training they get exposed to extensive practical work, which make them to develop interest in the subject. They are eager to share the knowledge with

the learners; however, they are discouraged by lack of resources. Teacher B outlined the following frustration:

> It is very much costly teaching in a less resourceful school and takes a lot of time to prepare a lesson that will accommodate all the needs of the learners for better learning to occur. It takes a lot of passion, sacrifice and money to be the best teacher in a less resourceful school. Additionally, if as a teacher, you are placed in a very rural and less resourceful school, the situation would be worse because majority learners in rural areas do not have that much of ambition academically and it would be quite challenging to teach such learners, particularly with less resources.

Genc, and Ogan-Bekiroglu (2002) seem to agree with the findings as the study indicates that teachers with more than ten years of teaching experience are directed to use the teacher centered approach. While on the hand the novice teachers are more on the learner centered approach. Hence, the experienced teachers are able to survive the dilemma of limited resources because their teaching approach is less demanding unlike the learner centered approach. Not only novice teachers indicated their demotivation due to lack of resources, but they also indicated that learners also seemed to be demotivated during the process of teaching and learning. This affirms the results from Marais (2016) that inadequate resources result in lack of motivation and learners' inability to cope with the learning content.

Both the novice and experienced teachers expressed the difficulties they have encountered when teaching Agricultural Sciences in poorly resourced schools. For example, Teacher B indicated that:

> It is just like getting into an empty class and teach whereas there won't be any interaction between the teacher and empty class. Agricultural Sciences itself is a practical subject, that need exposure on each topic lesson taken. It would be very difficult to teach in a school that does not have a textbook or laboratories at all. Learners have to own a textbook so that they get to see and know what they will be taught about. Teaching Agricultural Sciences without teaching resource is a waste of time and energy. Learners would find it very difficult to learn, as most of the content taught in Agricultural Sciences is of practical work and life experiences. Mostly all the topics are real-life situation related. So, teaching Agricultural Sciences in such schools is like depriving learners of their own knowledge. It would be difficult, and some may get confused even more learners will not get an idea of how it is like to be in Agricultural Sciences class it is tiring, depressing, and frustrating because all the time you will have to put more energy into learning even on very easy topics/ content because of no resources. It will need the teachers s' more attention in that they give more input, in a way of searching for more information to bring to the class so that learners can understands better and for them to get an idea.

CONCLUSION

The study outlined teachers' experiences in teaching Agricultural Sciences in schools where resources are limited or are not available. Based on the findings gathered through the research it is vivid that teachers are faced with difficult situations in teaching Agricultural Sciences in schools. It is also evident that teaching and learning resources

play an important role in influencing the type of activities that occur in the classroom. This brings us to the conclusion that the type of resources schools has tend to dictate how teaching and learning will transpire. The teachers interviewed also alluded that some part of the school curriculum is skipped because of lack of resources. This also brings to the fore that some teachers have difficulties in improvising, which puts the institutional capacity in the schools into question. All the challenges in these schools negatively affect the development of important farming skills which should be acquired during Agricultural Sciences teaching. This leads to learners not being able to use their education to improve their standard of living.

RECOMMENDATIONS

From the findings of this study, the following recommendations are outlined recommended:

1. All stakeholders who have interest in the development of the country should provide schools with teaching and learning resources for the betterment of learners' skills and knowledge. This is mainly because Agricultural Sciences as a subject has the capacity to bring improvement in people's lives if taught well practically and theoretically.
2. Former Agricultural Sciences colleges should be used as centres where Agricultural science teachers can go for in service training meanwhile learners go for practicals and exhibitions.

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