A COMPARATIVE STUDY ON THE PERFORMANCE OF STUDENTS IN PSLE AND JCE AGRICULTURE

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Abstract

Poor performance of learners in public schools in Botswana is a matter of concern for the entire nation. This study was triggered by this disorder which if not addressed robustly has potential to snip the nation's future. The study investigated the performance of learners in Agriculture at PSLE and JCE at Zwenshambe primary school and Zwenshambe CJSS utilising the qualitative research approach. Data collection techniques of individual interviews, focus groups and document analysis were used to solicit information on the performance of learners in agriculture. The findings of the study are that inadequate resources for teaching and learning, inability of learners to answer structured questions at PSLE, limited use of active methodologies and generalists' teachers PSLE are main causes of poor learner performance in public primary schools in Botswana. The study concludes that there is need for action if the nation still desires for functional education. It is recommended that the Ministry of Basic Education (MOBE) in collaboration with other stakeholders should ensure that Agriculture at primary schools is taught by specialist teachers. It is also critical to ensure that assessment on practical work in Agriculture starts at primary school level. **Keywords:** Agricultural education, secondary education, case study research, educational assessment

Introduction and background

Academic performance of students in Botswana has been declining for both primary and secondary schools. According to Kayane (2012) cited in Sibanda, Hulela and Tselaesele (2015) the concern of declining results for Primary School Leaving Examination (PSLE) and Junior certificate examinations (JCE) has been making headlines in formal ,informal meetings, in the political arena and in the media. To be exact Moloko-Mphale and Mhlauli (2014) stated that Junior Certificate results have shown a decline from 75.4% in 2010 to 41% in 2012 and indeed this was a drastic decline and a serious concern to the entire nation. Table 1 below shows the JCE quality percentage pass obtained from 2010 to 2016 and it clearly depicts a continual deterioration.

Agriculture as an industry forms part of the economic foundation of Botswana. According to AIEEE (2003) agriculture is very important to the economy of Botswana as it provides income, employment and food especially for the majority of the people living in rural areas. Hulela and Miller (2003) confirmed that agriculture plays a countless role in Botswana's economy and mentioned that agricultural education is integral in the quality of agricultural development in the country.

| Year | Quality pass% | | |
|------|---------------|--|--|
| 2010 | 75.4 | | |
| 2011 | 74.7 | | |
| 2012 | 41 | | |
| 2013 | 35.3 | | |
| 2014 | 34.6 | | |
| 2015 | 33.4 | | |
| 2016 | 32.54 | | |

Table 1: National JCE Quality % pass

Botswana Examination Council (<u>www.bec.co.bw</u>)

This is supported by Baliyan and Nenty (2015) who noted that 'Agricultural Education is one of the basic strategies for the development of the agricultural sector in Botswana" (p.377). The authors however, lamented that students have negative attitudes towards agricultural education such that a decline in enrolment for the subject at senior secondary school was observed. On the contrary, Hulela and Miller (2003) noted that agricultural education is now recognized as a very important subject to life and this has caused a change in attitude towards learning it.

The Botswana Government acknowledges that agriculture has the potential to contribute to government revenue generation and export earnings hence the inclusion of the subject in the curriculum at all levels. The aim of agricultural education is to equip students with knowledge and skills on agriculture so as to contribute to the growth of the economy. This has led to agricultural education becoming a component of general science at primary school, a compulsory subject at junior secondary school, a popular optional subject at senior secondary school and a popular career path. There is also the Botswana University of Agriculture and Natural Resources (BUAN) which offers only agrarian courses. It was established in 1967 as Botswana Agricultural College (BAC) and changed to Botswana College of Agriculture (BCA) in 1991. This institution has been operating as a college of Agriculture and on 16th July 2015 a bill was passed by parliament to establish it as a university. This upgrade to be a university indicates the value attached to agriculture in the country as it is aimed to produce many graduates who will be knowledgeable and skilled on agriculture and hence contribute immeasurably to the growth of this sector.

However achieving quality education has been a challenge in Botswana and across Africa. The lack of quality education in the continent according to Kudryashova, Gorbatova, Rybushkina and Ivanova (2016) explains why so many students learn little and lack basic arithmetic and literacy skills upon completion of primary education. Therefore potential human capital is lost in the process as students without a proper foundation will seldom rise up to do well at secondary school. The quality of education is at the core of whether students derive value from education and contribute to national development.

Theoretical framework underpinning this study

This study is fortified by the constructivist theory which views learners as active participants in the learning process. According to Major and Mangope (2012) constructivism is a learning theory which views knowledge construction as an active rather than a passive process. It is expedient therefore to have a learning environment that supports this and avoid one that impedes it. Batswana are an agrarian society and as such most of the students have prior knowledge on the concepts taught in Agriculture. It implies that given a proper platform Batswana children can construct knowledge based on what they already know from home and this could enhance mastery of tasks. Brainers and Piaget (2003) cited by Kudryashova et al (2016) view constructivism as a theory that believes that concepts should follow action and that new experiences build on already existing knowledge. It is our hope that the application of constructivist methodologies have potential to improve teaching and learning of agriculture.

Statement of the problem

Academic performance of schools in Botswana has been declining though the government has a quest for quality education. Botswana as a signatory to international frameworks like the Jomtien World Declaration on Education for All (EFA) should be moving towards the goal of achieving quality education but this has remained an illusion. As a matter of fact, poor results has been making headlines in the news as a national outcry. Quality education is measured by the quality of learners produced and the main standard used to measure this is the academic performance which in the case of public schools in Botswana has been drastically descending. This has been one major national concern more especially that it is experienced at all levels being Primary School Leaving Examinations (PSLE), Junior Certificate Examination (JCE) and Botswana General Certificate of Secondary Education (BGCSE). The nation is thus faced with this unpleasant and disturbing situation. Agriculture as a subject has been identified as a failing practical subject and this condition thwart students from further pursuing career in the area of agricultural science. The researchers also observed that there are learners who come with poor grades from PSLE agriculture but end up making significant improvements on their grades at JCE. Therefore, the study seeks to compare the performance at these two levels and possibly identify factors influencing the performance.

Objectives

The following two objectives underpinned the study:

a. To compare students' performance in Agriculture at PSLE and JCE.

b. To determine possible factors influencing students' performance in Agriculture at PSLE and at JCE

Literature review

In an effort to effectively address the concern of this study, we needed to unpack the concept of quality education. *What is quality education or quality of education?* For the past number of years, quality has continued to be a dominating and challenging notion in different fields of research (Jidamva, 2015). The term has been used in the commercial field and is increasing growing in the field of education. Throughout its history, the notion has remained a discussion agenda and varying definitions can be found, depending on the way the notion has been used. Quality has been defined as a high degree of goodness or excellence (Mosha, 2000), a degree of fitness to what the customer wants (Harvey and Green, 1993; Lomas, 2002) and the level of satisfaction with effectiveness in the service offered (Manyanga, 2007).

In the educational front, a good quality education is one that provides all learners with capabilities they require to become economically productive, develop sustainable livelihoods, contribute to peaceful and democratic societies and enhance individual well-being (Slade, 2017). One can also argue that according to SDG goal 4; quality education ensures inclusive and equitable quality education and promote lifelong learning. On the other hand, quality education is one that focuses on the whole child, that is, the social, emotional, mental, physical, and cognitive development of each student regardless of gender, race, ethnicity, socioeconomic status or geographic location. It prepares the child for life, not just for testing (Ban Ki moon, 2015) UN secretary general.

Raising the standard of education is one of Botswana's national goals (Republic of Botswana, 1994). The government thus sets performance standards to provide educators with criteria for measuring learner achievement (Ministry of Education, 2001). In the same report of the Ministry of Education (2001) it is articulated that issues of quality encompass improved curriculum, teacher training, infrastructure, well resourced schools and reasonable teacher pupil ratio. This study assessed if these issues of quality are provided and unearth the contribution of such provisions in Agricultural Education at both primary school and junior secondary school. This effort was meant to find out as to whether the foundations are strong enough to support the continuation of Agricultural education which will provide for the production of a strong human resource for the agricultural sector.

According to Mpolokang, Hulela and Baliyan (2015) the link between primary and junior secondary school content is inadequate. The authors highlighted that there is a great need to advocate for a smooth connection between curricular for preschool, primary secondary and tertiary education as learning is a developmental process as revealed by theorist Piaget and Vygotsky. Building from one level of education to the next enhances understanding and leads to effective learning. Mpolokang et al (2015) further articulated that there should be "continuity of the curricular" which encourages building on students' previous learning experiences that proponents of constructivism believe is the way to go in education. Contrarily, the current situation according to the view of teachers in Botswana, the primary alleged syllabus is more complex than the junior secondary school one and there is no connection between educators at these two levels.

The 3-year upper primary school agriculture syllabus runs from standard 5 to standard 7 and builds on the Environmental Science subject which is covered at lower primary and is a pre requisite for the junior secondary school agriculture syllabus. From scrutiny of syllabi, it is evident that some topics covered at primary are repeated at Junior Secondary School while some provide a base for the new topics covered there. This paper registers an argument that the development of the upper primary agriculture syllabus comes at a time when attitude change in the subject is necessary. The teaching of Agriculture at this level is hoped to encourage learners to develop positive attitudes towards practical work and inculcate in them the idea of taking agriculture as a business. This means it is aimed at developing a human resource that will be in a position to contribute to the economic growth of the country. As a matter of fact, active and interactive pedagogies are ideal for the implementation of this syllabus as stipulated in the syllabus document. Simply put, the syllabus also advocates for student centeredness which can be achieved through engaging learners in a lot of experiments and practical work.

The other critical component of the curriculum package worth considering is assessment at the primary and junior secondary school levels. These needs to be synchronised. The assessment at the two levels is different in that at primary level only one paper is used for assessment while three papers are used at JC. The paper used at PSLE is structured and as the only paper it constitutes 100% of the final grade while its equivalent at JC (paper 2) constitutes 40% with the other two papers contributing the remaining 60%. This means at PSLE there is no assessment of practical skills and multiple choice questions in Agriculture.

Methodology

A qualitative research approach was estimated suitable for the purpose of this study as it is "inductive and allows the researchers to describe and understand the particular situations, involvements and connotations of people and groups before developing and/or testing more general theories and explanations" (Frankel & Devers, 2000:253). Along the same, a case

study design was adopted for this study because it provides for the use of multiple sources and techniques during the data gathering process. According to McMillan and Schumacher (2006:316), a case study design focuses on one phenomenon in order to understand that phenomenon in depth, regardless of the number of persons or sites. A case study was selected as the researchers trusted that an extraordinary arrangement can be gained from a couple of cases of the phenomena under review. The researchers had to visit the respondents at their natural settings and document real life events, record what they say, observe their behaviour as they are immersed in their natural setting of everyday life in which the problem under the study is framed (Yin, 2009). This study assessed the performance of learners and made a comparison of this performance at PSLE and JSE using the mixed methods. The mixed methods approach is a pragmatic world view which entails a combination of both qualitative and quantitative methods in the design. According to Doyle, Brandy and Byrne (2014) the theoretical lens in this method "is greatly influenced by the positivist (quantitative) paradigm or naturalistic or constructivist (qualitative) tradition to which they align themselves."(p.176).

The research site for this study was Zwenshambe schools .Zwenshambe is a village in the North East region of Botswana and has only two schools which are Zwenshambe primary school and Zwenshambe Junior secondary school. The population in this study consisted of teachers of Agriculture at Zwenshambe CJSS and teachers at Zwenshambe primary school. Teachers of Agriculture at primary schools hold a minimum of Diploma in Primary Education and may not be specialists in Agriculture while teachers at junior secondary schools hold a minimum qualification of a Diploma in Secondary Education with Agriculture being their area of speciality. The study also targeted 20 students who were currently doing Agriculture and were to sit for PSLE or JCE and obtain data from them. This was convenience sampling of the schools where according to Patten (2001) selection is based on ease of accessibility hence being effort, money and time economic. The researcher used purposive sampling (non- probability sampling) to identify the teacher participants for this research to investigate the performance of learners in agricultural education JCE. The teachers of Agriculture at Zwenshambe CJSS are 4 including one of the the researchers so three (3) teachers participated in the research. From Zwenshambe primary school six teachers were requested to participate in this study as there were only six of them taking standard 5,6 and 7 classes at the time of this study. The study followed strict ethical conduct, based on permitted access and consent to participation, as well as protection of participants and secured data. The four techniques used to collect the requisite data were the individual interviews, group interview and lesson observation and document analysis.

Presentation of findings

Objective 1: To compare students' performance in Agriculture at PSLE and JCE. The objective was addressed by item 2 in section A of the questionnaire and data obtained from document analysis (students 'PSLE and JCE Agriculture results).

The data set comprised of the PSLE examination results for 2012, 2014, and 2015 matched to the corresponding JCE examination results for 2015, 2017 and 2018.

To address the objective based on evidence, a sample of 20 students were selected and their PSLE and JCE grades were compared.

Lot 1: PSLE 2012 and JCE 2015

Lot 2: PSLE 2014 and JCE 2017 Lot 3: PSLE 2015 and JCE 2018

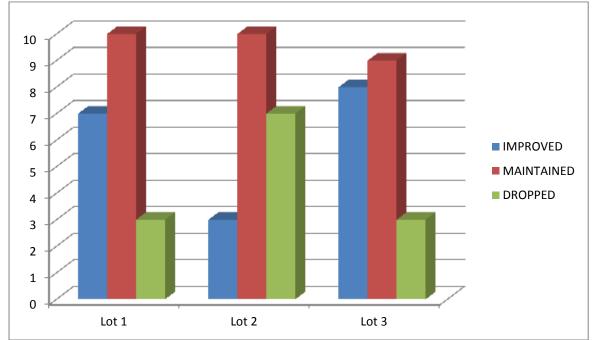


Figure 4: Summary of PSLE and JCE results

The graph above indicates that most of the students maintain their PSLE grades at JCE. A significant number of students dropped in Lot 2 while in Lot 1 and 3 a significant number of learners improved their performance at JCE. Findings show that generally across the years the number of learners who maintained their grades was higher than the number of those who improved or dropped. Also the number of learners whose performance went down is low in all the lots and adding the number of learners who maintained and those who improved one can safely say there is progress in learning as learners continue from primary to secondary school. This means there is a correlation in the performance of learners at PSLE and JCE in Agriculture.

With Item 2 of junior secondary school, agriculture teachers the researcher wanted to compare the PSLE and JCE results in agricultural education. The responses varied. One respondent (ST2) said, ' there is consistence in students results because the content covered at PLSE is also covered at JCE and this enable students to improve in performance'. The other participant (ST1) differed by arguing thus: 'No, there is no relationship in students' performance in agriculture at PLSE and JCE because at PLSE they dwell much on theory than practical while at JCE there is a bit of balance between theory and practical' Objective 2: To determine possible factors influencing students' performance in Agriculture at PSLE and at JCE

The objective is addressed by items 3, 4 and 5 of section A of the teachers questionnaire and item 1b,3 and 6 in section C of the same. The responses for section A were as follows;

Note: SD: Strongly disagree D: disagree SA: strogly agree A: agree

| Statement | SA | Α | SD | D |
|--------------------------------------|----------|----------|----------|----------|
| 3.I enjoy teaching agriculture | 2 | 4 | 0 | 0 |
| | (33.3%) | (66.7%) | (0%) | (0%) |
| 4.The resources that I need for | | | | |
| instruction are readily available in | 1 | 0(0%) | 4(66.7%) | 1 |
| my school | (16.6%) | | | (16.6%) |
| 5. My students like agriculture | 1(16.6%) | 2(66.7%) | 1(16.6%) | 2(66.7%) |

Table 3a : Responses from PSLE teachers

Table 3b : responses from JCE teachers

| Statement | SA | Α | SD | D |
|--------------------------------|----------|----------|-------|-------|
| 3.I enjoy teaching agriculture | 3 (100%) | 0(0%) | 0(0%) | |
| | | | | 0(0%) |
| 4.The resources that I need | | 2(66.7%) | 0(0%) | 0(0%) |
| for instruction are readily | 1(16.6%) | | | |
| available in my school | | | | |
| 5. My students like | 0(0%) | 3(100%) | 0(0%) | 0(0%) |
| agriculture | | | | |

Tables 3a and 3b show responses of teachers to 3-5 items from the questionnaire as indicated. It shows that Primary school teachers enjoy teaching Agriculture but not as much as the secondary school teachers who strongly agreed to the statement. For instance all the secondary school teachers representing 100% indicated that they strongly agree with the statement that they enjoy teaching agriculture while at primary school level the strongly agree option was picked by 2 out of 6 or 33.3% while 4 out of 6 or 66.7% of participants picked the option-agree.

On the question on resources, it is indicative that at primary school there is a problem of shortage of resources are available while the opposite is true for secondary school. Like can be seen from the table,67% of participants at primary school level chose the option strongly disagree to the statement- The resources that I need for instruction are readily available in my school. Only 1 or 16.6% and another 16.6% of participants chose the options strongly agree and disagree.

For item 5 results show that 50% of primary teachers believe their learners like agriculture while the other 50% believe that they do not like it. On the contrary, all the secondary school teacher participants believe that students like Agriculture. Therefore the attitude of learners at these two levels is not the same. In addition to the above data Teachers were asked about learners' attitude to agriculture as a subject. Teachers were asked an open ended question on

the questionnaire item 6: What can you say about the attitude of learners towards learning Agriculture?

The tables show that there is lack of resources for instruction at primary school. From the teachers' responses and information from the focus group interviews it is clear that the problem was more serious at primary school than at secondary school. Teachers at Primary school lamented that they do not even have a garden where they can do the practical work. They said some garden tools were available but underutilized as they could only be shown to students as teaching aids while the actual practical garden work could not be done. Consequently, secondary school teachers reported that though they have tools they do not have the livestock so they cannot carry out demonstrations using those tools for example there are ear tag applicators, tags, egg grader and teeth clippers but no livestock (goats, chickens and rabbits).

The farm structures (poultry house, rabbitry, goat shed) at Zwenshambe secondary schools are dilapidated and not in a position to be used. At the time of data collection goats from the village got into the school garden and fortunate enough they did not do much damage to the students vegetable project which was ongoing and due for moderation (Paper 3). This shows that the structures are not in a good condition such that even the project which forms part of the learners final Agriculture grade could be damaged by animals from outside.

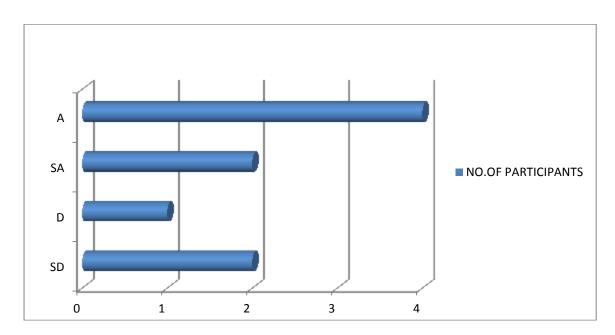


Figure 5: A summary of Students attitudes towards Agriculture

The graph gives a summary of the responses for both primary and secondary school teachers. It clearly shows that most of the teachers feel that students have a good attitude towards agriculture.

The findings show that learners have a good attitude towards Agriculture except for the practical work. However, learners at secondary school understand the benefits of the practical work but some still do not like it. The opposite was found out at primary school because even though there is no practical work, learners felt they needed to do them and blamed their poor performance on being taught Agriculture in a more theoretical manner while it is a practical subject. One learner at primary school boldly declared that if you do something you can easily remember it compared to things which you are just told. The findings also revealed that

some learners view Agriculture as a difficult subject and that alone affects their performance. A secondary school teacher noted that primary school background on Agriculture is one factor affecting performance at JCE as learners carry misconceptions which they developed from being taught by what he described as non-agriculture specialists. This teacher strongly believed that performance of learners improves at JCE because learners are taught by specialists who teach Agriculture in a more detailed manner as opposed to primary teachers who may not be Agriculture specialists.

At primary school learners said that some of them have a negative attitude towards Agriculture as they think it is for old people. According to the group that was interviewed, such learners cannot participate in Agricultural activities at home.

Another issue that came up was child abuse at home, too much use of social media and learner involvement in love affairs which they said lead to poor concentration in class hence poor performance not only in Agriculture but in all subjects.

Discussion of findings

The findings revealed that most of the students either maintain or improve their grades in Agriculture at JCE and only a few drop for instance in Lot 1 and 3 only 15% of the students dropped. Findings show categorically that half of the learners maintain their Agriculture PSLE grades at JCE. This is a positive outcome bearing in mind that the syllabi are expected to build on each other as according to the note on the PSLE Agriculture syllabus the PSLE syllabus is a prerequisite for junior secondary school syllabus. For this reason learners are expected to have a foundation on crop and livestock production at primary school and build on that foundation at junior secondary school hence perform better.

Findings from secondary school teachers reveal that most of the students improve their performance and they believed that this is because they build on what they have learnt at primary school. They appreciated the work done at primary school as it offers a base on which they build. Contrariwise, in comparing the grades of students for the three lots it was found out that less than 25% of the learners improved their Agriculture PSLE grade when they got to JCE. Nevertheless, the current secondary school students when interviewed exposed that majority of them have improved in Agriculture since they came to secondary school and were optimistic that they were going to outperform their PSLE performance since they now had a better understanding of the subject. Fifty (50%) of the learners maintained the grades they obtained at PSLE and adding the number of learners who improved to those who maintained their grades showed that there was an improvement as only a few learners performed poorly at JCE compared to how they would have fared at PSLE.

With respect to factors contributing to poor performance, several were highlighted. Lack of resources was cited as one of the topmost factor affecting performance in Agriculture since the nature of the subject demands that practical activities be carried out. This is commensurate with Hulela (2014) who argued that inadequacy of resources was the main setback to achieving desired results in Agriculture. With this state of affairs, one wonders whether Botswana is moving towards quality education like the report of the Ministry of Education (2001) claims. Unavailability of the resources limits demonstrations in agriculture lessons and consequently comprehension of concepts is hampered leading to poor results. Macheng and Keolitile (2014) support the findings by revealing that students decried lack of textbooks and resources for practical work and that this is deemed a factor leading to failure in Agriculture. This is true because Agriculture is a practical subject and if it is taught like any other theory based subject then comprehension of concepts by learners is bound to be challenging hence poor performance. The constructivist theory which informed this study views learner as active participants in the learning process and the problem of lack of

resources hinders its practice in schools as learners end up being passive receivers of information.

Another factor affecting performance that this study unearthed was congested syllabus. Teachers revealed that the syllabus material is too much given the time in which it should be covered. This leaves them with no option but to rush through to complete the syllabi and this culminates to failure by students. In a survey by Ntebolang (2010) cited by Mungoo and Moorad (2015) junior secondary school teachers singled out pressure to complete the syllabus as one mammoth setback to the implementation of innovative strategies. Some teaching strategies require more time particularly the student based approaches while teacher centred approaches are much time economic.

Students' attitude towards Agriculture at Zwenshambe secondary school was found to be good except for some students who have a negative attitude especially when it comes to practical work. This makes it to be a contributory factor to poor performance because if learners do not do well on the practical work. This is consistent with the notion by Baliyan and Nenty (2015) that students have negative attitudes towards agricultural education such that a decline in enrolment for the subject at senior secondary school was observed. One may conclude that at primary school and junior secondary school some learners just take Agriculture because it is compulsory.

Learners at primary school revealed that they perform poorly on the structured paper used because they have problems with spelling. This was confirmed by secondary school learners who believed that they had the same problem at primary school but as they moved to secondary school they do much better on the paper because of the practice they were given at primary school .On the same note T4 from primary school noted that learners at primary school do not do well in Agriculture because the nature of the paper is beyond their level of comprehension in relation to their age. This rings true as it is stipulated by Macheng and Keoletile (2014) that it was in 2009 when the assessment of agriculture at PSLE was changed from objective to subjective testing utility (structured questions) that a continual drastic decline in performance was observed.

Conclusion

From the research findings, it was clear that the majority of learners improved their performance in Agriculture when they got to junior secondary school. Majority of the informants strongly felt that lack of resources, time constraints, use of poor teaching methods to a greater extent contributed to poor performance by students in Agriculture. Teachers highlighted negative attitude towards the subject particularly with regards to practical work by some students to be a contributory factor to their poor performance. It is said that inner drive is the way to success but with guidance the students' perception about the subject can be changed. Therefore there is a need for action. Resources should be availed in schools so that Agriculture lessons can be characterised by more, activities since agriculture is a practical subject. Demonstrations and activities should dominate agriculture lessons and learners should be more engaged as opposed to other subjects that are theory based.

Recommendations

Based on the findings of this study the researchers recommend thus:

1. The Ministry of Basic Education (MOBE) in collaboration with other stakeholders should ensure that Agriculture at primary schools is taught by specialist teachers.

2. All resources needed for instruction in Agriculture both at primary school and secondary schools should be availed.

4. Assessment on practical work in Agriculture should start right from primary school. This will provide a good foundation for future learning in Agriculture.

5. Primary school teachers should work in collaboration with secondary school teachers with a view to share effective strategies that could help improve performance at all levels.

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