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TEACHERS AND LEARNERS IN VOCATIONAL AGRICULTURAL HIGH SCHOOLS FACE CHALLENGES: THE NEWS FROM CAMEROON

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ABSTRACT: *Challenges in teaching and learning agriculture remain an important and unresolved problem across sub-Saharan Africa. The purpose of this study was to explore the challenges in teaching and learning agriculture in Vocational Agricultural High schools in Cameroon. Using a mixed method descriptive survey research design, data was collected with separate questionnaires for students and teachers. A total of 98 respondents, 18 teachers and 80 students from the 3 existing agricultural high schools were involved. Purposive, proportional and convenience sampling techniques were used to select the respondents. Data collected was analysed using descriptive statistical techniques. Several challenges were identified: inadequate teaching and learning resources, frequent use of teacher-centred teaching methods and the need to improve on training of teachers. Gaining vital insights into the current capacity and capability of the Technical and Vocational Education and Training (TVET) system in Cameroon especially related to the teaching and learning of agriculture and generating evidence needed to inform policy on possible ways of improving TVET delivery in high schools can contribute to the development of a skilled workforce and Cameroons sustainable development. We recommend the putting in place of a comprehensive TVET development policy that will make sure the available resources are well coordinated and distributed while those that are completely absent are purchased and all stakeholders participate in defining the training of teachers and students to ensure quality. This, could result in properly trained youths with directly employable skills, reduce unemployment and poverty, and in consequence, foster sustainable development.*

KEYWORDS: agricultural education, challenges, teaching and learning, educational policy, skills development

INTRODUCTION

The development and implementation of quality Technical and Vocational Education and Training (TVET) policies and teaching-learning programs can influence the

sustainable development of most African countries where high rates of poverty and youth unemployment remain a concern, and advance the fight against poverty (Okiror et al., 2017). The world's population is projected to be 10 billion by 2050 with that of Africa alone expected to increase to about 2.5 billion people, most of which will be young people under the age of 25 (DESA, 2017). Africa thus has one of the fastest growing populations in the world (United Nations, 2010) and this increase is associated with increasing problems of youth unemployment, poverty, food security, school dropout, and crime (ILO, 2012) with renewed consequences on the sustainable development (SD) of already fragile economies. It is estimated that close to 375 million of these youths should be in the workforce by 2030 (DESA, 2017). This rapid growth of mostly impoverished youths with no employable skills, coupled with limited supply of jobs thus constitutes a serious deterrent to economic growth in Africa. There is, therefore, a growing policy concern about the need for countries to consider Technical and Vocational Education and Training (TVET) as a viable alternative to raising the skills level of these youths to obtain a productive workforce (African Union, 2007). TVET, refers to all forms of education and training, which provides learners with skills and knowledge related to the world of work in different sectors of the economy for poverty alleviation and economic development (Pavlova, 2014; UNESCO-UNEVOC, 2002; Mclean & David, 2009; Schneider & Kogan 2008).

Despite the apparent advantages of TVET, it is said to have been neglected in the education policy of several African countries due to problems of high cost, a poor quality of training and an observed mismatch between the training offered and the expectations of the employers (Boutin et al., 2009). It has been suggested that diversifying the curriculum by integrating prevocational and vocational courses in school programs could: facilitate the transition between the skills that are learned in school and those which are required at work, increase equity to access to education, and increase the career options of the students upon their graduation (Psacharopoulos, 1985; Che, 2007). There is clear need for policy and practice that supports the provision of quality TVET in Africa.

Quality TVET could potentially play a key role in improving the quality of life by developing skilled manpower to facilitate economic development (Acker & Gasperini 2009; Tilak, 2002). At the heart of education is teaching and learning (Hammerseley, 2000; 2002) and the quality of education in any system can hardly rise above the level of its teaching (Elom, 2014). There is an observed low quality of TVET teaching in Africa generally linked to an inadequate supply and underqualified teachers, poor teacher training, lack of, or outdated instructional equipment and a low-quality learning that emphasises theory and certification with little attention to quality and the development of practical competencies (AU, 2007). It has been suggested that TVET could play a significant role in SD across Africa (Bloom et al., 2006). Consequently, most policy makers in Africa have considered strengthening their TVET education policies as a means of reducing the rates of school dropout and unemployment, by focusing on human resource development through appropriate training to promote national development and industrialisation (Afeti, 2014; de Bruijn, 2004; Said, 2018).

In Cameroon, Part III – (3) of Law No 98/004 of 14 April 1998 to Lay Down Guidelines for Education states that "in addition to general education, practical training shall be provided to students in vocational colleges and high schools, on the basis of the courses they choose". In addition, in its poverty reduction strategy paper (PRSP, 2003), the Cameroonian Government stated that its goal is to develop the TVET sector as a means of facilitating the integration of its graduates into the workforce. Therefore, TVET is supposed to develop the skilled workforce to facilitate the economic development and emergence of the country (Ibrahim et al., 2012). Because agriculture is the backbone of Cameroon's economy and food security remains a critical issue, agricultural high schools were created, and a new curriculum was introduced (Ministry of Secondary Education, 2015).

The purpose of creating agricultural high schools is to provide students with the skills they need to practice agriculture as a profession. By doing so, it is believed that the students could become self-employed while contributing to food security and SD. The objectives of teaching and learning agriculture in agricultural high schools as extracted from the teaching curriculum include to: arouse students' interest in the field of agriculture, enable students acquire and develop basic agricultural skills, make students become aware of the opportunities that exist in agriculture, and prepare students for direct employment in agricultural occupation as agricultural technicians (Ministry of Secondary Education, 2015).

Unfortunately, there seems to be no national policy to ensure effective teaching and learning of TVET courses like agriculture and the economic situation of Cameroon is characterised by low quality education provision, high rates of youth unemployment, and very low productivity caused by inadequate or poor training (Zouliatou, 2017). Several authors have researched on strategies and challenges to the effective teaching and learning of TVET Courses in a number of countries (for example: Amaechi & Thomas, 2016; Knobloch et al., 2007; Michael & Marinos, 2017; Misbah et al., 2015; Modebelu & Nwakpadolu, 2013; Plackl´e et al., 2014; Said, 2018; Darko et al., 2015; 2016), but current empirical data on effective teaching and learning of TVET courses like agriculture and any associated challenges for Cameroon is scarce and undocumented. Due to its great agricultural potentials, and socio-economic characteristics, Cameroon remains such a great case study to explore the issues.

Several studies out of Cameroon have reported the shortage of qualified TVET teachers, inadequate and sometimes outdated curricula, the use of inappropriate teaching methods, as well as inadequate infrastructure as some of the challenges to TVET (Afred & Kayoma, 2012; Okoye & Okwelle, 2015; Moses & Kingsley, 2013; Uwaifo & Uwaifo, 2009; Ayonmike et al., 2015). TVET in Cameroon is said to suffer from similar problems with general education like the lack of funding, infrastructure, trained teachers, and a poor management system (Atayo, 2000; Che, 2007). Due to lack of resources, practical subjects are sometimes taught in a theoretical manner with inadequate levels of investment needed to achieve high quality outcomes for learners (Efande, 2015; Harteis, 2009).

There is clearly a paucity of information on the challenges to effective teaching and learning vocational agriculture and the implications this could have on Cameroon's

sustainable development. Determining what teachers and students perceive as challenges in teaching and learning TVET courses like agriculture might be vital in developing appropriate policies to enhance the teaching learning process (Dahl, 1995), increase youth employability and reduce poverty. Here, we report the use of a mixed method design to measure the perceptions of teachers and students on the challenges in teaching and learning agriculture and the implications for sustainable development.

Research Problem

Approximately two thirds of the population of the world live in rural areas with their main activity being agriculture (World Bank, 2005). In 2009, it was estimated that over 1 billion people globally were employed in an agriculture related activity (Proctor & Lucchesi, 2012). In-spite of the fact that agriculture is a major source of employment and economic growth in several African countries including Cameroon, problems of food security and sustainable development remain critical (Vandenbosch, 2006).

In Cameroon, agriculture is responsible for employing about 70% of its workforce while providing roughly 44% of the country's GDP and roughly 30% of export revenue, making it undeniably the backbone of Cameroons economy (Zef et al., 2017). The World Commission on Environment and Development suggested the need to enhance agricultural productivity (WCED, 1987). Improving food production is an important focus of agricultural education. This is the reason why several countries (Cameroon included) have included agriculture as part of their TVET secondary education curriculum (Vandenbosch, 2006).

In addition, youth unemployment in Cameroon remains high (World Bank, 2014a). It has been suggested that the quality of teaching and learning TVET courses like agriculture could have a direct impact on youth employment, productivity and economic development (AU, 2007). Therefore, there is a need to increase the quality and relevance of TVET delivery as this might contribute both to raising agricultural productivity in Cameroon and reducing unemployment and poverty by increasing the employable skills and competencies of the youths thus fostering sustainable development (Lewin, 1998; 2001; Amedome & Fiagbe, 2013).

Regrettably, very little attention has been paid to the teaching and learning of agriculture in high schools in Cameroon. To our knowledge, there are no reports on the quality of education provided to students in public and private agricultural high schools, specifically the teaching methods used, the availability of practical equipment and the challenges that teachers and students might encounter in the teaching and learning of agriculture in Cameroon. Further, there is scarcity of information on how effective agricultural high schools are in preparing their graduates for employment in agribusiness. In addition, there is a need to ensure that teachers are aware and practice the art of making informed decisions on what teaching methods they can use, and how and why specific teaching methods should be used in teaching agriculture as such decisions have serious implications on the teaching and learning process, and effectiveness thereof.

Purpose and Research Questions

The purpose of this study was to explore the challenges facing teaching and learning of agriculture in public and private TVET high schools in Cameroon. In so doing, it sought to assess the capacity and capability requirements needed to achieve policy goals as set out in the training program (Ministry of Secondary Education, 2015) and propose possible solutions. The study was guided by the following research questions:

1. What teaching and learning resources (TLR) are available in agricultural high schools and to what extent do teachers use these TLR in teaching agriculture?
2. What teaching methods are used by teachers in teaching agriculture in Cameroon and which of them is perceived to be most effective and why?
3. What are the factors teachers and students consider hinder the effective teaching and learning of agriculture?
4. What are the training needs of teachers?

METHODS

The study used a simultaneous mixed method survey design in which selection of teachers and students was purposeful to include teachers and students in all the three options of agriculture (Plant Production (PP), Animal Production (AP) and Transformation (T)) offered in all three schools. This approach ensured that quantitative data obtained using closed-ended questions was complimented by data coming from the qualitative data gathered using open-ended questions which, combined with asking teachers and students similar questions, maximised triangulation. Therefore, both sets of data enrich each other as there is some form of conversation between the quantitative and the qualitative data with the potentials of increasing both the breadth and the depth of the research and by so doing offset any possible weaknesses that would arise if only one approach was used and provide a better understanding of the research problem (Creswell, 2014; Johnson & Onwuegbuzie, 2004).

Research Design

The descriptive component of the survey, employing both closed and open-ended questions, was aimed at providing a description of the phenomenon of interest: the challenges of teaching and learning agriculture in Cameroonian agricultural high schools. This descriptive survey method is important to both administrators and policy analysts for planning, monitoring and evaluation purposes and addresses questions that relate to costs, quantity, adequacy and effectiveness (O'Sullivan & Rassel, 1999). The questionnaire administered to both teachers and students provided data on their opinions, attitudes and a variety of social issues related to education (Orodho, 2009). Questionnaire items were cross-validated by a TVET expert.

Population, Sample and Sampling Technique

The sampling frame for this study consisted of all the teachers and upper sixth (''Terminale'') students in the three (03) existing agricultural high schools in Cameroon. A total of 98 respondents were used as the study's sample, 18 teachers with a minimum of three years' experience and 80 upper sixth (terminale) students. The stratification ensured that teachers and students in all the three options offered in

agricultural high schools were represented. Six teachers were selected from each school, 2 from each of the three options. Proportional sampling was adopted to select students because the number of students varied between schools. The questionnaires were administered and collected by the researcher with a response rate of 100%.

Research Instrument, Validity and reliability

Data was collected using two questionnaires: one for the teachers and one for the students. These were designed based on material obtained from the review of literature and the research questions which served as the guide in formulating the items on the questionnaires. The questionnaire included both open and close-ended questions. The questionnaire for teachers had 6 parts while that for students consisted of 5 parts. To ensure validity and reliability, both questionnaires were carefully scrutinised. We selected ''information rich'' experienced teachers and final year students who have been learning agriculture for at least three years. Further, a direct contact was established with the teachers and students to gather their views and the answered questionnaires were collected by the researcher. The questionnaires were considered reliable (Trochim & Donnelly, 2005; Kombo & Tromp, 2006) in the sense of producing similar results with repeated trials (Orodho, 2009).

Data Collection and Analysis

To collect data, we travelled to College Bullieire Sa'ah and IAO Obala where we met with the school heads who introduced us to the teachers and students. Information on the research was read out by us, then copies of the consent form and questionnaires were handed to the teachers who filled them in at their convenience during the day. We returned to the school at the end of the day and collected the questionnaires. The students were administered the questionnaires and consent forms in their classes. All the questionnaires distributed were returned, giving a response rate of 100%. The procedure for data collection from students and teachers from LTPAY varied slightly. This was because, after finalising travel arrangements with the school head, we were informed that the students were scattered all over the country for internship. Given that the students were to resume classes the same week we had to return to Cambridge, we adopted an approach which took us to most of the centres were these students were on internship and administered the questionnaires until we reached the target of 30 students. A possible implication of this is that we might have missed a student with "rich" information. However, considering that the selection of students was random and 30 students from a total of 45 in the class responded to the questionnaire, it is hoped that results were not influenced negatively. For the teachers, we made individual contacts with them and was able to arrange to meet with them in Yaounde where most of them came for holidays to cater for their professional issues at the ministry or where the students were on internship and teachers were going to evaluate what was going on.

Using the SPSS software version 25, the data collected was anonymised to meet BERA guidelines, coded and analysed using descriptive statistical techniques such as frequencies, percentages, pie charts, bar graphs, means and standard deviation. The frequency and percentage tables provided an overall view of the findings. This approach

using tables, helped us to identify the trends and then show any existing relationships between different parts of the results as posited by Gay (2011).

Assumptions, Ethical Considerations and Researcher Positionality

In carrying out this research using the chosen method, it was assumed that: (i) the teachers and students who responded to the questionnaires were all experienced and had good knowledge in teaching and learning; (ii) both the teachers and students understood all the items on the questionnaire and the answers they provided were based solely on their knowledge and experience as teachers and students of agriculture, and (iii) the data collected reflects the true perceptions of the teachers and students. The ethical guidelines of the British Educational Research Association (BERA) were followed and participants where provided with an information sheet explaining the purpose and importance of the study and a copy of the consent form with explanations of how the data will be analysed and stored to guarantee confidentiality**.** The results obtained from the teacher survey were triangulated with those of students.

FINDINGS AND DISCUSSION

Research Question 1: What teaching and learning resources (TLR) are available in agricultural high schools and to what extent do teachers use these TLR in teaching agriculture?

This first research question sort to determine if teaching learning resources were available, needed for teaching and learning and available in adequate quantities. It was clear from the responses of the teachers, that some teaching learning resources are available and needed for teaching and learning but not available in adequate quantities.

Table 1: Teachers Report on the Availability, Need and Adequacy of teaching learning resources

Factors		Agriculture classrooms N (%)	Agriculture lab. And workshops N (%)	School farm N (%)	Production/ application farms N (%)	Tractors N (%)
Available in school	*Yes*	18 (100.0)	8 (44.4)	12 (66.7)	12 (66.7)	12 (66.7)
	No	00 (0.0)	10 (55.6)	6 (33.3)	6 (33.3)	6 (33.3)
Needed for teaching	*Yes*	18 (100.0)	14 (77.8)	17 (94.4)	17 (94.4)	16 (88.9)
	No	00 (0.0)	4 (22.2)	1 (5.6)	1 (5.6)	2 (11.1)
Available in adequate supply for teaching	*Yes*	4 (22.2)	3 (16.7)	1 (5.6)	7 (38.9)	8 (44.4)
	No	14 (77.8)	15 (83.3)	17 (94.4)	11 (61.1)	10 (55.6)

N= frequency

The results in Table 1 seem to highlight an interplay of several issues. For example, we noticed in one of the schools that they had "good" laboratory buildings that were donated by the Chinese government, but these laboratories are either unequipped, equipped with machines that are poorly adapted to the local environment or the

instructions for using the equipment are in Chinese, as is the case with the generator donated by the Chinese government in one of the schools. Agriculture is a practical subject and it might be difficult to imagine its effective teaching and learning in the absence of these essential TLR or if the teachers are unable to use them. Teachers in one of the schools reported not having a tractor. While donation of school facilities by donors remains a welcomed idea, it seems important that such donations be contextualized. Our personal reflection on this is that these teachers have ideas about what good agricultural teaching should be like but either lack the TLR or are unable to use those that are available, and this introduces the problem of capacity and capability. The teaching and learning of agricultural sciences require that TLR be available in adequate supplies and these supplies are very expensive, thus the need for funding. We equally observed that, while schools nominally have a piece of land labelled as a school farm, or a space termed a school laboratory, in practice these facilities are not practically available to the teachers, i.e. there is a significant resource-capacity issue. Such an interpretation is corroborated by the research of Amedorme & Fiagbe (2013) and Darko *et al*, (2015) who reported that TVET in Ghana was bedevilled with the limited or in some cases the complete lack of TLR. Similar results were reported by Oviawe *et al*, (2017) in Nigeria and Misganaw (2011) in Ethiopia. Earlier reports by UNESCO-UNEVOC (2002) stressed the inadequacy of resources for the effective teaching and learning of TVET courses like agriculture in most African countries and blamed this on the lack of funding.

To corroborate the findings from the teachers, we asked the students what resources they have used in school to learn agriculture. Their answers, we hoped, will provide us with an insight to what is available and needed as the students will likely report only those materials that their teachers have used in teaching to facilitate student learning. The results are summarized in Table 2.

Table 2: Resources students have used in school to learn agriculture

Variables		N	%
Agricultural classrooms	Yes	80	100.0
	No	0	0.0
Agricultural laboratory/workshops	Yes	32	40.0
	No	48	60.0
School farm	Yes	58	72.0
	No	22	27.5
Production/Application	Yes	37	46.0
	No	43	53.8
Farms tractors	Yes	55	68.8
	No	25	31.3
Total		80	100.0

N= frequency

Further, we sort to know if the TLR the available teaching resources, though not in adequate supplies, facilitated teaching and learning. Curiously, both teachers and students reported that though not adequate, the teaching learning resources available facilitated/improved their teaching and learning of agriculture (Table 3 and Table 4).

Table 3: Teacher's perceptions on whether the facilities available improve Teaching/learning of agriculture.

Variable		N	%
Teacher's perception	Yes	11	61.1
	No	7	38.9
Total		18	100.0

N= frequency

Table 4: Students' perceptions on using available resources to facilitate learning of agriculture

Variable		N	%
Students' perception	Yes	48	60.0
	No	32	40.0
Total		80	100.0

N= frequency

An interpretation of why teachers who report that the TLR they need to effectively teach agriculture are unavailable in adequate supplies (Table 1) state subsequently that the facilities available though inadequate, improved the teaching and learning of agriculture (Table 3) would be that from the limited resources they have at their disposal, they "do what they can do" in terms of teaching. This would suggest that given the recommendations advanced by these teachers, most of which Centre around the need for teaching learning resources, these teachers would like to advance in their teaching but are unable to do so for lack of the required facilities. In arguing for more TLR, we recognize separate reports by Darko et al (2015) and Nacino-Brown et al (1982) in which the authors argued that the mere availability and use of TLR is not a guarantee for effective teaching and learning. Instead, it is the proper selection and use by the teachers of the most adapted resources that can improve teaching and learning (Brown & McIntyre, 1993). What this might suggest is that, while ensuring the availability of TLR is important, making sure that these teachers, know how and when to use them, is also very important. Nonetheless, there is evidence that teachers would like to make greater use of more practical approaches to the teaching of agriculture, but the lack of access to appropriate resources such as school farms, impedes that desire.

Put together, the results show that, both teachers and students stress the need for more TLR that can make the teaching of agriculture more practical to be provided. These results suggest that both teachers and students might be interested in teaching and learning, but this desire is dampened by the lack or inadequate resources. Every good learning process in the TVET system should lead to students gaining what is valued as the attributes of the knowledge worker; skills, expertise and knowledge (Anastasiou, 2011). Without the required resources, it is hard to imagine effective teaching and learning taking place that provides both underpinning theoretical knowledge and practical competencies.

Research Question 2: What teaching methods are used by teachers in teaching agriculture in Cameroon and which of them is perceived to be most effective and why?

The results show that most of the teachers adopt (and are perhaps more comfortable using) teacher-centred and non-practical methods like illustrated chalk and talk and lecture methods in teaching agriculture (Table 5 and Table 6).

Table 5: The teaching methods used by teachers in teaching agriculture

Variables	N	%
Demonstration	1	5.6
Illustrated Talk and Chalk	7	38.9
Discussion	3	16.7
Lecture	6	33.3
Project	1	5.6

N= frequency

Table 6: Teaching Methods students report are used by teachers in teaching agriculture

Variables	N	%
Demonstration	8	10.0
Illustrated chalk and talk	59	73.8
Lecture	8	10.0
Assignment	2	2.5
Discussion	1	1.3
Field trips and excursions	1	1.3
Project based method	1	1.3
Total	80	100.0

N= frequency

Using conventional/teacher-centred methods in teaching TVET courses like agriculture in secondary schools' not only makes the students to be passive participants in teaching/learning transactions, it also makes the lessons potentially quite boring and attracts very little interest on the part of the students (Pullan et al., 2013). This might result in ineffective learning, thus preventing the students from acquiring the skills they need (Ofoegbu, 2015; Amaechi & Thomas, 2016). It is reasonable to suggest that an over-emphasis on theoretical learning using teacher-centred approaches to teaching agriculture is unlikely to develop students with the practical skills needed by employers. Learning a practical subject like agriculture might be more relevant when students are allowed the opportunity to inquire into or interact with practical problems, instead of being instructed for most of the time in classrooms (Mabie & Baker, 1996). Agricultural science teachers should avoid over use of rote learning strategies as should methods are unlikely to train students with employable skills for sustainability. Given the proper pedagogical tools, one would hope that teachers should be able to plan more experiential lessons that can inspire students into the agricultural sector.

On asking teachers which teaching methods they do not use in teaching and why, it became clear, and in line with the results we have described earlier, that teaching methods requiring financial and other practical TLR and/or with a student-centred approach were the least likely to be adopted by the teachers (Table 7).

Table 7: Teaching methods not used by the teachers and why

Variables	N	%
Excursion	8	44.4
Project-based method	4	22.2
Experimentation/Discovery	3	16.7
demonstration	1	5.6
Discussion	1	5.6
Lecture	1	5.6

N= frequency

The use of teacher-centred methods, unlikely to produce the practical competencies desired by learners and required by employers, is likely the product of a combination of factors including the lack of practical materials and facilities, and possibly the pedagogical knowledge to effectively use some of the available materials. The latter suggestion can, however, only be tested if and when teachers have access to better teaching resources when it can be ascertained the ways in which and the extent to which they can be utilized by the current training force given its state of pedagogical skill development. The likelihood is, nonetheless, that the supply of additional practical learning resources will need to be matched with professional development activity that supports the effective use of such resources.

The teachers showed a clear understanding that teaching methods that involve hands on practice by the students are the best in teaching agriculture even though they are not using them (Table 8). This seems to be the conversation being portrayed between the results in table 7 and those in Table 8 below.

Table 8: Teacher's choice of the best method of teaching agriculture

Variables	N	%
Demonstration	13	72.2
Experimentation/Discovery	3	16.7
Project based	2	11.1
Total	18	100.0

N= frequency

An important emerging theme from the results of this survey is that most of the students believe any method that makes them active, facilitates their understanding of agriculture (Table 9). Thus, they prefer teachers to use more engaging or practical approaches to teaching and learning. It is advised that teachers should always consider using a combination of teaching methods to accommodate different learning styles. The teaching and learning of agriculture should be transformational, discourage rote learning and incorporate innovative strategies of teaching and learning that combine several skills-based approaches like demonstration and project-based.

Table 9: Method which when used by the teachers will helps students understand agriculture better and the reasons advanced by students for these choices

Method	N	%	Reason (s)
Demonstration	46	57.5	-it helps me practice based on the theory learned -it makes me ready for employment -I see what I am supposed to do then do it hence I gain employable skills
Illustrated chalk and talk	4	5.0	- This helps us to understand the theoretical aspects of agriculture as the teacher explains the difficulty terminologies
Lecture	2	2.5	-it is a good way of making sure that our teachers complete the syllabus before we take end of course examinations -as a student, I am forced to search information myself to prepare for lectures
Assignment	4	5	-Through assignments, I understand better what was taught in class -This method helps me do research and discover new things myself
Experimentation	7	8.8	-By observing our teachers carry out the experiment, ask questions then try it ourselves, we gain practical skills
Discussion	7	8.8	-During discussions, I can ask questions and get direct responses that help me understand better
Field trips and excursions	2	2.5	-This method not only develops my practical skills through field experience but helps me meet potential employers
Project based method	8	10	-It helps me gain confidence in the skills I have learned by practicing it myself with time-to-time guardians from the teacher -It facilitates my acquisition of skills and gives me the opportunity to adjust on concepts I did not understand in class
Total	80	100.0	

N= frequency

Research question 3: What are the factors teachers and students consider hinder the effective teaching and learning of agriculture?

Inadequate funds, laboratory facilities, farms and classroom facilities, teaching equipment's and insufficient/poorly qualified teachers are some of the challenges that hinder the effective teaching and learning of agriculture in Cameroon (Table 10). In the absence of these facilities coupled with poorly qualified teachers, it becomes unlikely that students could be trained to be skilled enough to meet the needs of potential employees. This further highlights the need for more practical teaching learning resources and quality teacher training.

Table 10: Frequencies and percentage response of teachers and students on the challenges to effective teaching and learning of agriculture in high schools

Item	Teachers N (%)	Students N (%)
Textbooks	5 (27.8)	1 (1.3)
Farm facilities	3 (16.7)	8 (10)
Laboratory facilities	3 (16.7)	21 (26.6)
Classroom facilities	2 (11.1)	10 (12.5)
Teaching equipment	2 (11.1)	14 (17.5)
Qualified teachers	1 (5.6)	7 (8.8)
Funding/finances	1 (5.6)	13 (16.3)
Large size classes	1 (5.6)	0 (0.0)
Consumables	0 (0.0)	5 (6.3)
Total	18 (100.0)	80 (100.0)

N= frequency

Quality teaching and learning of agriculture seems indispensable to sustainable development especially in countries whose economies depend on agriculture (UNESCO-UNEVOC, 2002). It therefore seems important to consider equipping agricultural high schools with adequate materials and equipment's and qualified teachers that could ensure effective teaching and learning using a skilled-based approach (Egbule, 2004; Modebelu & Duvie, 2012). Quality learning only occurs after quality teaching and this requires the presence of a conducive environment with the needed resources. Hence, there is a need for resources plus investing in the capability to use these resources to enhance effective teaching and learning of agriculture.

Research question 3: What are the training needs of teachers?

For beginning teachers, ensuring they had the knowledge and skills needed for lesson planning and preparation was the most important competency the teachers suggest must be included in any teacher education curricula (Table 11).

Table 11: Most important competence to include in agriculture teacher education curricula

Variables	N	%
Lesson Planning & Preparation	12	66.7
Career guidance and counselling	1	5.6
Supervising students' projects	1	5.6
Farm management	2	11.1
Community outreach	1	5.6
Total	18	100.0

N= frequency

Possibly due to lack of adequate practical learning resources in their schools, most teachers did not identify the pressing need to develop their skills in using, say, laboratory equipment to design practical work, or the skills needed for effective demonstration when asked the most important competency for which they require personal development. Details of the results are shown in Table 12.

Table 12: Most important competency identified by teachers for which they require personal development

Variables	N	%
Lesson Planning & Preparation	7	38.9
Laboratory work	4	22.2
Career guidance and counselling	3	16.7
Classroom teaching	1	5.6
Supervising students' projects	1	5.6
Record keeping	1	5.6
Community outreach	1	5.6
Total	18	100.0

N= frequency

When teachers were asked to access their student's readiness for self-employment in agriculture business upon graduation, it was revealing that most of the teachers think upon graduation, their students lack some of the skills they need to be ready for self-employment in agribusiness. This could be read as a reflection on their teaching, i.e. they had not had the opportunity to develop these skills in the students because of the lack of the right learning resources and materials and perhaps their capabilities to utilize such resources effectively to develop the needed competencies (Table 13).

Table 13: Students' readiness for self-employment in agriculture business

Responses	N	%
Lack some skills	12	83.3
Competent	5	27.8
Incompetent	1	11.1
Total	18	100.0

N= frequency

Significance

Education in general and TVET in particular remains an important tool for economic development and is indispensable to the socio-political and economic stability of every nation. Students learning is highly dependent on effective teaching while effective teaching requires that teachers possess, and be highly skilled in combining their knowledge of the subject matter, learners and learning, and teaching methods. Through

this research, we gained vital insights into the current capacity and capability of the TVET system in Cameroon especially related to the teaching and learning of agriculture in agricultural high schools and generated evidence needed to inform policy on possible ways of improving TVET delivery in Agricultural high schools. Developing and implementing a sound agricultural education policy should lead to an increase in youth employment thereby reducing poverty, inequality and insecurity and result to sustainable development in Cameroon.

CONCLUSION

The purpose of this study was to determine the challenges facing teaching and learning of agriculture in public and private agricultural high schools in Cameroon. Through this study, we assessed the capacity and capability requirements needed to achieve policy goals as set out in the training program (Ministry of Secondary Education, 2015).

All students and teachers who participated in this research agreed that agriculture is an important field of studies that is important for employment, food security and sustainable development. This reflects the importance attached to agriculture and agricultural education in the policies of the Cameroonian government. However, the evidence collected in this study indicates that the capacity and capability does not yet exist to develop a high performing agricultural TVET system. In particular, the evidence collected suggest that teaching and learning of agriculture in public and private high schools in Cameroon faces multiple challenges that require urgent attention to facilitate the development of the practical competencies needed by learners to facilitate their integration into the workforce and raise agricultural productivity needed for sustainable development. At the centre of these challenges seems to be the inadequacy of teaching-learning resources available in the schools, and the concomitant use of teacher-centred teaching methods. If teachers are to adopt the use of student-centred methods like demonstration in teaching, there is a need to provide better access to learning resources that enable such teaching, and probably the necessity to improve training and retraining of teachers.

Further, in initial teacher education programs, the time allocated for practical internship during which teachers could learn, given an adequate supply of the necessary resources, the necessary pedagogic knowledge and skills to enact more practical learning is very short. Also, teachers already in the workforce are likely to need professional development activities to up skill them to enact a wider pedagogical repertoire.

Based on the findings of this research, it is concluded that the three existing agricultural high schools as they currently exist might not be able to effectively inculcate into students, the necessary vocational skills needed to ascertain that high school graduates are competent and directly employable. Hence, the need to build the capacity and capability required to meet policy ambitions.

Recommendations

The findings reveal several challenges which require concerted efforts to convert them into opportunities. There is need for immediate involvement of all the stakeholders

while raising public awareness on the advantages of engaging in quality agriculture and other TVET programs. Based on the findings of this study, the following recommendations are advanced to improve on the effectiveness of teaching and learning vocational agriculture in high schools in Cameroon:

The government, Parents Teachers Association, as well as other stakeholders and private education providers should work in synergy to ensure the availability in adequate quantities of teaching learning resources like laboratories, farms, teaching equipment's, and classroom facilities.

In the absence of low-cost alternatives, special and additional funds should be allocated by the Ministry of Secondary Education to all technical and vocational education courses like agriculture to cover the cost of very costly equipment that is needed to study the practical aspects of the course.

In-service training and seminars to provide teachers with new techniques of teaching should be carried out regularly. Also, Pedagogic Inspectors should be made to visit schools more often and ensure that agriculture is taught in a student-centred manner using the skilled-based approach.

TVET teacher training colleges operate in a 6:12:6 months rotation that allows the trainees to spend their first six months on campus learning the theoretical aspects of agriculture and pedagogy, the next 12 months in the industry gaining practical experience before returning to complete the last 6months at the teacher training institute with teaching practice and Thesis report write up. This will provide them with more hands on practice skills unlike the current 16:3:6 month's rotation where teachers spend over a year (16months) in the classroom, the next 03months on internship and return to complete the last 6 months in school for Thesis write up and defence.

There is need for a comprehensive TVET development policy that will make sure the available resources are well coordinated and distributed while those that are completely absent are purchased and all stakeholders participate in defining the training of teachers and students to ensure quality. This could result in properly trained youths with directly employable skills, reduce unemployment and poverty and in consequence foster sustainable development.

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