BISHOP STUART UNIVERSITY.



RELEVANCY OF MODERN AGRICULTURE EDUCATION PRACTICES ON STUDENTS' FARMING PRACTICAL SKILLS IN SECONDARY SCHOOLS OF KABUJOGERA TOWN COUNCIL, KITAGWENDA DISTRICT.

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JUNE, 2024.

Declaration.

I, **Everest Turyamureba,** declare that this dissertation is my own work and has never been submitted for any academic award in any Institution or University.

Signature.Everest:..... Date..05.../.06..../..2024.....

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Approval.

This is to certify that this dissertation has been done under the supervision of the following supervisors and is ready for submission for further examination.

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Dedication.

I dedicate this dissertation to my wife Madam Atukunda Leticia and the entire family of Mzee Katalikawe for the encouragement towards my academic achievements.

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This dissertation would not have seen the light of the day without the contribution and efforts of a number of people to whom I would like to pass a word of appreciation.

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Abstract

The study explored the relevancy of modern agriculture education practices on students' farming practical skills in secondary schools in Kabujogera Town council, Kitagwenda district. The study was guided by three specific objectives which were to; (i) examine different methods used to teach modern agriculture in secondary schools, (ii) identify the challenges experienced in modern agriculture education in secondary schools, (iii) evaluate the strategies to enhance modern agriculture education in order to improve practical skills among secondary students.

The study employed a cross-sectional study design that used both quantitative and qualitative approaches of data collection. The study used a sample size of 248. The study used questionnaires and interview guide to collect data. The data collected was analysed using Statistical Package for Social Scientists (SPSS version 22.0).

The study examined modern agricultural methods which had significant relationship with improving students' farming practical skills in secondary schools. These included; utilization of modern agricultural inputs, Use of improved farm machines, Pre and Post-harvest handling, and use of irrigation equipment. The study further identified that there were significant challenges experienced in modern agriculture education in secondary schools. These included; limited modern agricultural in puts at [p = 0.001], lack of resources to use [p = 0.005], poor motivation among students and teachers [p = 0.003], limited school farm size [p = 0.001] and poor learning environment [p = 0.004]. The study finally concluded that strategies to enhance modern agriculture education had significant association with improving student's farming practical skills. Such as; agriculture tours and field trips (p=.027), class discussion student involvement (p=.029), use of practical demonstration method(p=.004) and recruitment of experienced agriculture teachers (p=.028).

The study recommended that; there should be training and re-training among teachers and students of agricultural science on use of modern agricultural technology for teaching and learning in secondary schools. The government should provide necessary inputs and farm machineries for teaching and learning agricultural science. Secondary schools should ensure establishment of enough demonstration farms that students would constantly visit in order to copy much on how to do agriculture practical work to improve their skills and experience. Agricultural science students should go for field-trips and excursion in technology oriented farms to enhance to further boost their motivation from agriculture. Government should fund and invest in agricultural education programme in secondary schools particularly private ones so as to equip student- teachers of agriculture.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter presented the background of the study, problem statement, objectives, research questions, scope, significance, justification and conceptual frame work.

1.1 Background of the study

According to Brand, (2018), agriculture is an ever-changing approach to agricultural innovations and farming practices that helps farmers increase efficiency and reduce the amount of natural resources needed to meet the world's food, fuel and fiber demand.

Globally, the 21st Century has created a new focus on Career and Technical Education (CTE) which streamlines modernization of agriculture, in order to prepare students with enough scientific skills for the workforce and post-secondary education (Rayfield et al., 2017). “Students in today’s culture must develop a variety of skills outside the narrow occupational skills focused on in historical Career and Technical Education (CTE) programs (Rayfield et al., 2017). Modern agricultural education programs were designed and developed to offer students the chance to obtain innovative content knowledge and practical skills required to succeed in post-secondary education, and the workplace (Brand, 2018).

Modern agriculture education provides students with a solid foundation in agricultural science, including plant biology, soil science, pest management, and sustainable practices (Zhou et al., 2021). Students apply this theoretical knowledge through practical skills, such as planting, irrigation, fertilization, and harvesting techniques (Oluwaseun et al., 2022). Education programs emphasize sustainable farming practices, teaching students about crop rotation, organic farming, and conservation techniques. Students learn to implement these practices on the farm, balancing

productivity with environmental stewardship. Students are often involved in extension services, where they apply their knowledge to help local farmers improve their practices as this his experience is invaluable for developing practical communication skills and understanding the real-world impact of agricultural education.

Agricultural modernization has long been an important part of agriculture and agricultural education (PMA, 2016). At one time, the basic curriculum guide for production agriculture in Texas suggested one-quarter of the school year should be devoted to teaching agricultural modernization (Williams, 2018). This is because of the emphasis placed on agricultural modernization is easy to see why agriculture teachers need to be able to perform skills and have scientific knowledge related to agricultural mechanics (PMA, 2016). Curriculum continues to change each year making it difficult for educators to stay abreast. However, if instructors are to be successful, they must continue to change and adapt to current needs of industry.

In sub-Saharan Africa, the agricultural sector is still the dominant provider of employment, and it remains crucial for economic growth (Tschirley et al., 2015). Moreover in most parts of Africa modern agriculture is still a critical issue and therefore food production will continue to be a major focus of agricultural education and training institutions (Vandenbosch, 2006). The rationale for offering agriculture to secondary school students counter the apparent negative attitude to farming by many secondary school students, whose occupational choices are often limited, and thus exposing them to the knowledge and skills that they would require in agricultural production, should they choose to become farmers (Abalu, 2001).

In Africa, Agricultural education and training in secondary institutions will play a strategic role in helping to prepare Africa's rapidly growing youth populations for productive careers in the growing segments of the agri-food system (Tschirley et al., 2015). This study examines challenges facing Agricultural education institutions as they strive to simultaneously

accommodate growing enrollments and shifting skill needed by students to get involved in agriculture as their source of self-employment after studies (Tschirley et al., 2015). The study by Darko et al, (2016) observed that graduates of agriculture science in Ghana often lacked the required skills and competencies in basic agricultural practices making them unable to engage in agricultural production as professionals.

In East Africa, the teaching of agriculture particularly in Kenya and Tanzania is expected to promote the acquisition of skills for self-reliance in farming (Mark, 2018). It is viewed as particularly critical for the development of East African countries as agriculture is the main economic activity in most parts in East Africa (Thomasian, 2019). The overall objective of the agriculture education is the development of basic agricultural skills relevant to Kenya and the learners' home environment. The second aim is to expand the student's knowledge on basic principles and practices in agriculture (Murray, 2019). The third aim is to develop students understanding of the value of agriculture to the family and community with a view to promoting self-reliance, resourcefulness, problem solving abilities as well as changing the occupation outlook in agriculture. Fourth, students who take the course are expected to be active participants in rural development activities while in school (Mark, 2018).

The content of the secondary school agriculture syllabus includes crop and livestock production, farm machinery, farm structures and agricultural economics (Ngesa, 2016). Key areas of coverage include soil science, water conservation, supply and irrigation, land reclamation, farm layout, principles of crop production, crop parts and diseases, crop production practices, crop types; principles of livestock production, farm power tools, equipment and machinery, farm records, land tenure and land reform, production economics, farm accounts, agricultural marketing and agricultural organizations (Ngesa, 2016).

In Uganda, the agricultural sector accounts for 24% of the national GDP and employs almost 60% of the country's youth labour force (Uganda Bureau of Statistics, 2016). While its critical relevance in the global economy is indisputable, agriculture's capacity to produce enough food and create more jobs that are decent is under threat owing largely to limited human resource capabilities (Elder & Rosas, 2015). Agriculture stands out as the greatest source of livelihood to the greater percentage of the population. The economy's GDP (36%) is derived from agriculture, 31% of the economy's export value is from agriculture and the sector is employing about 81% of the total labour force of which 56% are small scale subsistence farmers based in the rural areas (FAO, 2014). Leaving weather factors constant, the greatest problems of subsistence farming have been poor yields, pests and diseases, poor farming methods and poor soil conservation measures (World Bank, 2017).

The teaching of agriculture in Secondary's started as early as 1925 with the aim of relating educational activities to the community needs of the people (Ndawula & Ngobi, 2014).According to Education Policy Review Commission of 1989, emphasized vocationalization of education, including agriculture in Secondary schools. The idea was to provide continuity for vocational education which had been neglected.

The secondary agriculture syllabus aims to impart practical skills to the students. However, modern agriculture is taught theoretically in the classroom since most schools do not have enough land for practical skills on modern farming (Okillan & Asianut, 2021). The practical component also demands a lot of funds which may be difficult for many Secondary schools to secure in order to facilitate the practical teaching of the subject. Darko et al., (2016), observed that the government has allocated insufficient funds for Secondary school and limited practical materials and this has affected the agricultural education while imparting practical skills to students.

1.2 Statement of the Problem.

In an ideal scenario, agriculture education in secondary schools should seamlessly integrate both theoretical knowledge and practical skills (Juma et al., 2023). Students should be able to apply classroom learning to actual farming practices, thereby enhancing their productivity and contributing to local agricultural development. The curriculum should be up-to-date with modern agricultural techniques, including the use of advanced tools, sustainable farming practices, and contemporary crop management strategies. Schools should have well-equipped agricultural laboratories, demonstration farms, and access to modern farming equipment (Juma et al., 2023).

The current state of agriculture education in secondary schools within Kabujogera Town Council falls short of this ideal. While the curriculum may cover essential theoretical aspects, there is a significant gap in practical training. Schools often lack the necessary infrastructure, such as demonstration farms and modern agricultural tools, which hinders students' ability to gain hands-on experience. Teachers may also lack continuous professional development opportunities to stay abreast of the latest advancements in agricultural education. Consequently, students graduate with limited practical skills, making it difficult for them to engage in effective farming practices or pursue agricultural entrepreneurship (Mukasa & Kaggwa, 2021).

Several initiatives have been undertaken to improve agriculture education in the region. Some schools have attempted to establish small school gardens or farms where students can practice farming. Additionally, there have been efforts to incorporate more practical sessions into the curriculum. External organizations and government programs have occasionally provided support in terms of training materials and agricultural tools. Workshops and short courses aimed at enhancing teachers' skills have also been conducted sporadically (Ouma & Okello, 2022).

Despite these efforts, a significant gap remains between the desired outcomes and the actual state of agriculture education. The initiatives are often fragmented and insufficiently funded, leading

to inconsistent implementation across schools. There is a lack of a comprehensive strategy to integrate modern agricultural practices into the education system effectively. Moreover, the support for continuous teacher development is irregular, limiting the overall impact on students' practical skills. This gap indicates a need for a more systematic and well-funded approach to revamp agriculture education to make it more relevant and practical to secondary students (Kato et al., 2023).

1.3 General objective.

To assess the relevancy of Modern Agriculture Education practices on students' farming practical skills in secondary schools in Kabujogera Town council, Kitagwenda district.

1.4 Research objectives.

i. To examine different methods of teaching Modern Agriculture in secondary schools in Kabujogera Town council, Kitagwenda district.

ii. To identify the challenges experienced in modern agriculture education in secondary schools in Kabujogera Town council, Kitagwenda district.

iii. To evaluate the strategies to enhance modern agriculture education in order to improve practical skills among secondary students in the study area.

1.5 Research Questions.

i. What are the different methods of teaching Modern Agriculture in secondary schools in Kabujogera Town council, Kitagwenda district?

ii. What are the challenges experienced in modern agriculture education in secondary schools?

iii. What strategies can be employed to enhance modern agriculture education in order to improve practical skills among secondary students in the study area?

1.6 Scope of the study.

1.6.1 Geographical scope.

The study was carried out in Kabujogera Town council, Kitagwenda district.

1.6.2 Content scope.

The study was limited to assessing the relevancy of Modern Agriculture Education on students' farming practical skills in secondary schools in Kabujogera Town council, Kitagwenda district. It specifically looked at different methods of teaching Modern Agriculture in secondary schools, the challenges experienced in modern agriculture education in secondary schools and evaluated the strategies to enhance modern agriculture education in order to improve practical skills among secondary students.

1.6.3 Time scope.

This study was conducted for a period of 6 months from February, 2023 to August, 2023. Literature reviewed was for studies conducted in last 11 years (2011 to 2022).

1.7 Justification of the study.

Uganda's national development objectives and planning are reflected in a recently introduced approach to development (GoU, 2014). Recent economic and other surveys indicate that agricultural productivity, particularly food production, has decreased between 2015 and 2016. A staple food production, in particular, recorded a decline of twenty-five percent, while potatoes, beans, and wheat also recorded decreased production due to limited agricultural education. The study thus ties into the government's intensified efforts to develop the agricultural sector by focusing on the role of schooling in rural development in general, and in agricultural practice in particular.

The study is important in that there is a need to improve the quality of secondary education as expansion increases at a rate that outstrips the country's economic ability to meet agricultural students' needs. Secondary education has to be adaptive and creative to enable individuals acquire knowledge, skills and attitudes which permitted them to effectively participate in the development of their society. In addition, by addressing the question of correspondence between

the content of agricultural curriculum, school instruction and agricultural practice, this study addresses the potential multiplier effect of modern agricultural education. Finally, it is hoped that this work will result in some practical implications for education policy and practice, for curriculum development and/or the use of school plots for economic gains. In such ways modern agriculture that is taught in secondary schools might take the pressure off parents to pay for educational costs, and even foster more positive attitudes to employment due to practical skill acquisition in the agricultural sector.

1.8 Significance of the Study.

The findings of this study are useful in the following ways;

Study results will create adequate opportunities to the Ministry of Education and Sports, other related stakeholders of education to know the challenges pertaining to Agriculture Education in Senior High Schools.

The findings of the study will be helpful to school administrators whose duty is to raise the standards of the subject in their schools. Furthermore, the study will provide insight into the challenges, if any, of the teaching and learning of agricultural science in secondary school. The issues raised in the study and the suggestions made would be beneficial in the modification of facilities and programs to improve the existing situations in the schools.

It will further help teachers to find better methods of handling the subject in order to arouse and maintain the interest of students in agriculture and help them choose it as a vocation.

The ministry of Education may use the findings of this study to design pre-service and in-service courses for teachers of agriculture.

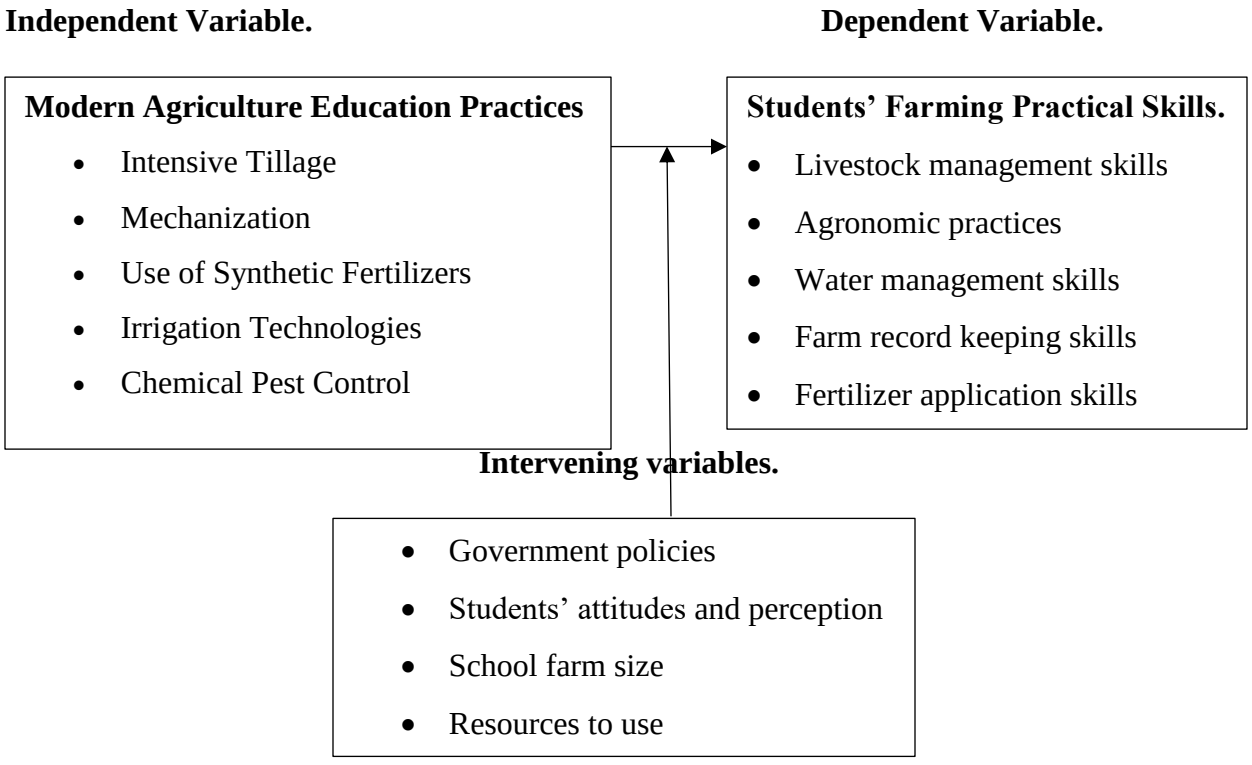
The schools teaching agriculture will use the findings in the attempts to make secondary agricultural education more relevant and effective.

Future researchers will also use the study findings as a source of literature in studies related to modern agriculture and practical skill acquisition.

The study will finally help the researcher/student to acquire his Master of Agriculture and Rural Innovations at Bishop Stuart University.

1.9 Conceptual Framework.

The conceptual framework based on a systems model as specified by Miles & Huberman, (2014) which provides an analytical framework for development interventions. It was based on a three factor model shown in the diagram below: consisting of a) modern agriculture education as the independent variable; b) farming practical skills as dependent variable and c) the intervening variables.



Source: Miles & Huberman, (2014)

Figure 1.1: conceptual frame work.

The conceptual frame work sets to look at the relationship between study variables.

All modern agricultural technologies like mechanization, irrigation, application of synthetic fertilizers and among others would lead to farming practical skills when the intervening variables like streamlined government policies, school farm size, resources to use are held constant or put in considerations. Intensive tillage involves deep plowing of a large area of soil to prepare it for planting crops; students learn how intensive tillage affects soil structure, composition, and fertility. This knowledge is crucial for making informed decisions about crop management and soil conservation. Intensive tillage can lead to soil erosion. Students gain practical skills in assessing erosion risks and implementing soil conservation techniques like contour plowing and the use of cover crop. The study of mechanization in secondary schools will be influenced by the size of the farm for example such technology needs a large piece of land which would help all students to have hands on experience as this would help students to learn how use to manage agronomic practices. Use of synthetic fertilizers is influenced by government policies through extension agents who should carry out some external trainings and invite agricultural teachers to learn what they should teach students to improve on their skills, acquisition of such fertilizers is also affected since the government does not distribute it to schools at subsidized price for practical sessions as this would improve fertilizer application skills among students due to easy accessibility.

The learning and teaching of irrigation technologies would also be influenced by availability of resource use since irrigation equipment are expensive and hard to access and this would also affect students from getting skills on water management at farm level.

CHAPTER TWO

LITERATURE REVIEW.

2.0 Introduction.

This chapter reviewed literature in relation to the study objectives.

2.1 Different methods of Modern Agriculture used in secondary schools.

Nnodim and Raji (2020) posited that modern agricultural technologies increases agricultural production and sustainability substantially. For example, new disease resistant hybrid reduces the rate of risk and uncertainties in crop and livestock farming. This shows that farm inputs are also aspect of agricultural technologies, which are needed for effective impartation of agricultural knowledge to students (Eischen, 2017). In teaching agricultural science, modern farm input should be an indispensable resource when carrying out practical exercises of agricultural science curriculum. United Nation Educational Scientific Cultural Organization (2015) asserted that effective teaching and learning of the curriculum requires efficient systems that would provide supportive learning environment, motivated teachers with mastery of pedagogy and their subject matter, adequate access to teaching and learning resources as well as students who are ready to learn.

Utilization of modern agricultural inputs in teaching and learning practical sessions; such as fertilizers, agrochemicals and improved seeds in delivering agricultural science curriculum content helps to create awareness to agricultural science students on modern inputs available to them for efficient farm productivity. (Laugo, 2019). This demand will also in turn enables Agricultural science teachers participate in agricultural extension activities from the schools.

In developed countries, agriculture students learn application of crop sensors; Effective application of fertilizers and pesticides remains to be a big challenge in agriculture especially when it comes to the determination of what fertilizer works best for different plans, when to

apply, as well as what quantities (Foster et al., 2015). The use of crop sensors can make it easy for farmers to effectively apply fertilizers and pesticides just as much as the crops need (Elder & Rosas, 2015). Such technology gives farmers the opportunity to sense how your plants are feeling and subsequently help you reduce the probability of leaching or surface runoff. Crops sensors are designed in a manner that they dictate to the application machinery the amount of the resource that a given crop needs, and at what time (Hurst et al., 2020).

Students are taught precision agriculture.

In the past, most farms treated their fields as one unit. They irrigated to meet the needs of their crops as a whole (Osborne and Collins, 2018). Advancements in technology have allowed farmers to monitor their plants' needs on a more precise scale. High tech monitoring of moisture levels, soil conditions, and pest damage allows precise action to be taken on small, individualized areas of the fields. Precision agriculture is decreasing the cost of farming by minimizing the amount farmers spend on irrigation (Daluba, 2017). The work of farming is becoming more efficient as farmers treat specific needs rather than the farm as a whole.

Biotechnology.

Biotechnology is also referred to as genetic engineering and the process of improving the genes of a given crop. In most cases, genetic engineering is carried out to increase the resistance of certain crops to farm inputs such the application of herbicides (Annor-Frempong, 2020). Through biotechnology, farmers can plant on areas that were otherwise considered dry or deserts. Reduced farm inputs implies that the farmer as well saves on the cost of farm resources (Murray, 2019).

Modern agricultural technology hopes to achieve among others, two important goals profitable economy and better output. It is therefore, important to be careful with the goals and objectives that you set aiming upon the implementation of different technologies in agriculture (Prestridge & Tondeur, 2015). Some of the aspects that you should look at include how to apply and

organize fertilizer, irrigation, theatre, intensive tillage, monoculture, and the application of other resources. However, in order to achieve these goals, farmers need to understand the concept of modern farming and the use of technology (Prestridge & Tondeur, 2015).

Use of improved farm machines in teaching and learning.

One of the challenges that farmers face nowadays is the need to satisfy labor. There is an increasing cost of labor, which calls for better approaches to ensure less cost on labor (Kathuri, 2018). The introduction of combined harvesters and planters simplifies the process. Production and time are some of the important elements in agriculture. It is important, therefore, to plant early, harvest in time, as well as ensure that the yield is stored within the right time (Kathuri, 2018). The use of modern technology in agriculture ensures that farmers grow vast food within the shortest time possible. GPS technology has been used in the development of autopilot sprayers and tractors that do not require any driver. Such technology is important in agriculture in that it promotes better and more efficient farming practices (Kathuri, 2018). For example, the autopilot tractors and sprayers are equipped with tracking systems that eliminates human error and in the end save on fuel and equipment.

Use of Modern Greenhouses in teaching and learning.

Once only used for early season seedlings, modern greenhouses now provide full crop production year round (FAO, 2014). Advancements in technology have provided lighting and automated control systems needed to create an indoor growing environment for famers. Robotic systems can provide the perfect amount of irrigation, light, and humidity to produce crops indoors (FAO, 2014). Vertical farming, hydroponic farming, and aeroponic farming are all growing practices that utilize the modern greenhouse.

Monoculture.

In agriculture, monoculture is the practice of growing one crop species in a field at a time. Monoculture is widely used in intensive farming and in organic farming: both a 1,000-acre cornfield and a 10-hectare field of organic kale are monocultures (Tayyab, 2021). Monoculture crops have allowed farmers to increase efficiency in planting, managing, and harvesting, mainly by facilitating the use of machinery in these operations, but monocultures can also increase the risk of diseases or pest outbreaks (Tayyab, 2021).

2.2 Challenges experienced in modern agriculture education in secondary schools

Student attitudes, perception and behaviours.

Many public school teachers also cite student attitudes, such as apathy and disrespect for teachers, as a major problem facing schools today. A poll from the National Center for Education Statistics (2019) cited that problems like apathy, tardiness, disrespect and absenteeism posed significant challenges for teachers. These issues were seen more frequently at the secondary school level, rather than the primary grade and this has affected efficient agriculture education (Nzarirwehi, 2018).

Funding.

Budget cuts have created huge problems for most public schools in recent years. Less funding means smaller staffs, fewer resources and a lower number of services for students (Hmelo, (2017). While some argue that throwing more money at the education problems won't make them go away, others assert that lack of agricultural funding caused many of the problems in the first place (Hmelo, 2017).

Lack of Parental Involvement.

Often teachers find there is no happy medium when it comes to parental involvement as parents deny students farm plots to practice agricultural theories into practical (Troussas et al,

2020).Some parents won't be seen for some school agriculture practical seminars, no matter what sort of issues might arise. Others never seem to go away, hovering over the student and teacher and interfering with the education process (Rehman et al, 2016). There are ways parents can become involved and support their child's education at the same time, but teachers don't always get that level from parents (Rehman et al, 2016).

Technology.

Students are less technologically advanced than many teachers today, putting instructors at a decided disadvantage in the classroom (Dods, 2020). However, a student's love of technology also tends to distract them from their school education work. When teachers don't have the techno-savvy to compete with those devices, by bringing education and technology together, it can be difficult to keep students' interest and attention to properly teach new agriculture practical concepts (Gordon et al., 2019). Technology needs to come into the classroom to keep up with the learning demands of the 21st century. Schools that are already cash-strapped may find an unsurmountable challenge in coming up with the funding to bring computers and other forms of technology into their classes (Albanese and Mitchell, 2021). Scholastic offers some tips for school districts that want to fit the bill for technology, including everything from asking individuals in the district for "big gifts" to going to Uncle Sam for the funding (Albanese and Mitchell, 2021). The website also suggests negotiating prices on technology when possible and allowing student to bring their own from home.

Family factors also play a role in agriculture teacher's ability to teach students. Head teachers and teachers agree that what is going on at home will impact a student's propensity to teach science subjects (Hmelo & Silver, 2017). Divorce, single parents, poverty, violence and many other issues are all challenges a student brings to school every day. While some teachers and administrators try to work with children in less than ideal family environments, they can only do

so much especially when parents are often not willing to partner with the schools to provide for the children (Dyer and Osborne, 2016).

Some of these schools still face the challenges of substandard or poor infrastructure, unqualified teachers, poor sanitation, high tax charges from government, poor grades, and among others (Krouska et al., 2019). To parents, all these challenges have a direct impact on their children's education. The fees charged from learners does not correspondent with what children receive from the schools (Krouska et al., 2019). Therefore, much as we spend a lot, some schools are not able to offer the expected grades and this becomes a "waste" of resources.

Poor teaching environment.

The environment of a given school plays a significant role in the teaching processes. This environment refers to the internal and external condition (Jessy and Charu, 2019). In areas where there is insecurity learners can never concentrate in class. The climate of the area also affect the teaching and learning of agriculture as a subject. Teachers are supposed to develop conducive training environments of their students by holding symposium in the school, having agriculture clubs and remedial teaching (Joyce and Weil, 2017). The environment does play a role in the teaching and the learning process of any subject. Home environment has an impact on what goes on schools. Hammer (2018) says parents can largely affect performance of children when they provide them with favorable study environment at home. Phillip (2018) says parental education and their social status have some influence on student academic achievement.

Difficulty in motivating students to learn agriculture.

Motivation is a psychological process which determines the intensity, direction and persistence of behaviors related to learning. Motivation is the fulcrum that focuses on the students (Gardener and Tremblay, 2015). A student progressive performance in school is determined by his or her

motivation by teachers and parents. A student who is highly motivated will tend to outperform his fellow students. The student should see the need of wanting to learn and appreciate what the teacher is saying. Any teacher's effort will mean little if he/she does not appreciate the importance of motivating the student to learn (Gardener and Tremblay, 2015). The subject matter being taught by the teacher should appeal to the student's personal academic and professional goals (Gardner & Lambart, 2017).

Motivation influences acquisition of practical skills. Engagement is the students' attention and focus on achievement related contents and tasks (Handre et al., 2019). They added that students with more positive motivational profiles in a particular subject area are more likely to take courses in that area and to choose related college majors and career paths. This study therefore focused on individual students characteristics which affect teaching and learning of Modern Agriculture in Secondary schools (Resilient Educator, 2020).

Limited Instructional Resources.

A survey by Andola (2012) found out that there were few agriculture textbooks compared to the number of agriculture students in class. The ratio appeared to be one text book per every three students. In addition to using textbook, teachers should use teaching aid to facilitate their teaching of modern agriculture (Ayot and Patel, 2018). Most of the agriculture textbooks place a lot of emphasis on un contextualized grammar and vocabulary presentation. Its grammar is presented as a list of structures which lacks rational relevance or context. Meaning that agriculture text books are poorly graded and lack references to social context (Grace, 2010).

Limited agriculture resources to use while teaching and learning are important because they have some positive effect on performance of agriculture subject as well as improving practical skills (Kathuru, 2014). This has been the case in many education institutions and has been a challenge because teachers fail to use teaching aids due to scarcity and yet they enhance understanding of students in class. Courts and Ghai (2017), observe that the distribution of teaching and learning

materials such as books and practical equipment account for a significant difference in performance amongst schools. Learning would be passive and boring to student if teaching and learning resources are not incorporated in the lesson. These resources are supposed to be effectively organized and exploited for any meaningful teaching and learning of Agriculture lessons (Courts and Ghai, 2017). Eshiwani (2018) notes that most schools perform poorly because they do not spend significant amount of money in buying of teaching and learning resources for agriculture practical education, adequate relevant teaching and learning resources make teaching and learning interesting to the learners (Liu & Want, 2015).

Poor time management among students and teachers.

World Bank (2018) says in his 'study that overcrowding in agriculture lessons and overloading of Agriculture teachers affects their performance and efficiency in teaching agriculture. He continues to say that agriculture lessons were mostly taught in afternoon, when student are tired and cannot absorb much of what they are taught during afternoon hours. This allocation is based on the content to be covered. Camber and Kaaves (2018) observes that the amount of time allocated to a given subject has some effect on learner's understanding of what is being taught.

Teaching experience (as represented by number of years of teaching) and teaching qualification are positively co-related with student achievement. GOK (2019) appreciated the importance of teaching experience and in fact recommended that promotions of teachers be based on proven merit and experience. Some behavior such as teacher enthusiasm degree of orientation of teacher talk to achievement significantly affects student achievement. Lesley (2016) says that, at all levels of teaching agriculture; the major constraint is the quality of teaching. Unless a teacher can achieve personal relationship with his students or an extension worker with his farmers; unless students can be inspired to seek further knowledge themselves; unless enthusiasm can be brought to bear on the teaching, the teaching will be lifeless and the frames of inspiration remain lifeless (Hardre et al., 2019).

2.3 Strategies to enhance modern agriculture education in order to improve practical skills among secondary students.

Teachers in secondary schools in developing countries have been found to use various pedagogical strategies/methods at their disposal in teaching agriculture. The most common improved strategies in teaching and learning of agriculture in classes are digital learning, the lecture, class discussions, group work and questioning, demonstration, class projects, problem solving/guided discovery, and tours and field trips.

Digital learning.

Digital learning has currently found its way in education as technology advances especially with the novel coronavirus (Covid-19) (Nnodim & Raji, 2020). However, this has not been well exploited in secondary education although it is the most result-oriented approach due to its appeal to adolescents. Different teachers use different methods depending on the availability of facilities and resources as per the status of the institution (Nnodim & Raji, 2020). Technology provides the possibility of including multimedia and interactive resources that can make adult learning more attractive and realistic, encouraging and even inspiring adults to develop their skills. In reference to the youth who are the targeted future farmers, this technology can enhance their skills development and its application to the food industry (Nnodim & Raji, 2020).

Videos, radio, smart mobile phones, and television are among the information communication technology (ICT) tools that are gaining popularity in enhancing agriculture education and farmers' access to agricultural-related knowledge and information (Nnodim & Raji, 2020). Due to their social learning nature, videos in particular have a high potential to stimulate social learning because they combine visual and audio elements that facilitate internalization and contextualization of knowledge or information, which enable farmers to share and learn from

experiences. When incorporated into the classroom setting, the social learning nature of the ICT devices can fast-track skills development in agriculture and be the bait to making youths be more interested in agriculture (Nnodim & Raji, 2020). The utilization of mobile technologies in game-based learning improves the effectiveness of the educational process and augments students' knowledge; hence, an effective educational game design must achieve a balance between fun and educational value. Additionally, the use of computers, tablets, digital cameras, video conferencing technology, and Global Positioning Systems (GPS) devices can all enhance a student's learning experience (Bentley et al., 2021). The intuitive nature of the mobile technology, their affordability compared to other ICT devices, mobility, usability, and accessibility among the youth are factors that can ease their integration in agriculture (Bentley et al., 2021).

Problem-Solving Approach/Discovery Method/Problem-Based Learning.

The problem-solving approach is a student-centered approach to teaching where students participate in the learning process by contributing problems, analyzing the factors associated with the problems, developing possible solutions to the problems, placing the solution(s) into action, and evaluating the results of the solution (Burris and Garton, 2017).

Problem-based learning (PBL) is a constructivist approach to instruction that revolves around a real-world ill-structured problem (UNESCO, 2019). The method promotes both the acquisition of content knowledge and the development of thinking skills and strategies. Teachers typically take on the role of the facilitator and students become responsible for information learnt (Ball and Knobloch, 2019).This method typically ends with a presentation of solutions and an evaluation of the process used in solving the agricultural problems. The method can also be enhanced by enriching it with digital teaching and learning (Kurt, 2020).

According to, multimedia projects allow students to explore subject matter using film, audio, and even software they create (Tumuheki, 2017). When incorporated into secondary school agriculture, students develop an extensive and flexible knowledge base; develop effective problem-solving strategies; develop self-directed, lifelong learning skills; become effective collaborators; and become intrinsically motivated to learn (Ministry of Education and Sports, 2015). There is agreement on the contribution of PBL to factors such as knowledge retention, student satisfaction, motivation, and critical thinking; however, there is much less agreement on the role of PBL in knowledge acquisition. Studies have evidenced that PBL can help promote critical thinking skills among students and consistently display growth in problem-solving skills (Hardre et al., 2019).

The strategy has been found to be effective in promoting higher-order thinking. The discovery method has been found to improve student motivation and interest. Students also indicate more satisfaction with PBL than with traditional methods of instruction. However, controversy on the use of this approach is the existence of little empirical evidence as to what students are learning and how. In the context of the current study, problem-solving instruction may not fit the learning style of some students since abstract learners may not recognize problems as such when presented to them. Future studies may therefore require investigating the use of constructivist problem-based approaches to determine effects on learning outcomes in agriculture classrooms.

Agriculture class project strategy.

This strategy is a teacher-facilitated collaborative approach in which students acquire and apply knowledge and skills to define and solve realistic problems using a process of extended inquiry (Anderson et al., 2016). Class projects are therefore student-centered, following standards, parameters, and milestones clearly identified by the teacher. The project teaching method is based on the conviction that learning by doing, discussing in groups, and revisiting ideas and

experiences are superior ways of gaining a better understanding of one's environment (Shoulders, & Myers, 2019). According to existing literature, practical work though class projects makes learning more enjoyable and their purposes in agricultural education have expanded beyond skill acquisition and proficiency to include personal development for diverse career preparation beyond agriculture (Shoulders, & Myers, 2019). The current study advocates class projects as an important part of an agricultural education that provides application of concepts taught in class. Students can hence transfer the acquired skills to their homes (Shoulders & Myers, 2019).

Demonstration Method.

Through the demonstration method, the teacher does whatever the learners are expected to do at the end of the lesson by showing them how to do it and explaining the step-by-step process to them (Daluba, 2017). The demonstration may include diagrams, charts, e-learning, and other illustrative materials accompanied by an oral explanation in class. The audience observes the process, listens to the explanation, and poses questions during or at the conclusion of the demonstration (Smith et al, 2020). The demonstration method increases students' interest and understanding and consequently promotes high achievement rate. Demonstration procedures in agriculture may include machine milking, how to preserve fish, how to graft a mango tree, or how to install drip irrigation in a home garden (Smith et al, 2020). In the context of the current study, incorporation of demonstration improves both recall and psychomotor skills when the students are allowed to repeat the same procedures either individually or in groups (Anderson et al., 2016).

Tours and Field Trips.

The usual purpose of outdoor training through tours and field trips is to develop teamwork skills (Diise et al., 2018). Field trips to agricultural centers, industries, farmlands, etc., where students

get firsthand experience and practice of the theoretical methods of agriculture, can prove to be very helpful. However, assignments, write-ups, and projects must be given to students to aid them to participate effectively in the field trips (Diise et al., 2018). Tours and field trips in secondary schools may however disorient the school time table and hence need proper timing such as during the school mid-breaks and holidays. The field trip is one of the most complex and expensive activities in the educational system and hence should be planned as an integral part of the curriculum rather than as an isolated activity (Olowa, 2019). In the context of the current study, agriculture students can benefit from such experiences by employing the team spirit in school-based and community projects such as nursery practices and poultry projects from where they can sell the produce to both the school and the community making them food secure (Adom, 2020).

Class Discussion Strategy.

The use of discussions as a primary teaching method in agriculture allows the teacher to stimulate critical thinking on the learners (Olowa, 2019). This approach also helps the teacher establish a rapport with the students, demonstrating an appreciation of their contributions and challenging them to think more deeply and to articulate their ideas more clearly (Olowa, 2019). The frequent questions asked by both the teacher and the students provide a means of measuring learning and exploring in depth the key concepts of the course (Howell, 2019). Through class room discussions, a set of acquired skills that is necessary for establishing and developing interpersonal relationships such as communication skills, cooperation, emotional intelligence, and critical thinking is developed (Jenkins and Nelson, 2015). The current research advocates the incorporation of this approach to develop these skills to help students have a clear picture of the likely causes, effects, and mitigation measures of food insecurity in their homes, community, and the nation at large (Norman and Schmidt, 2021). Discussion can be improved through

incorporation of digital technology. For instance, if a student does not feel comfortable speaking in a classroom of more than 40–50 students, they may post a "Tweet" or virtual learning environment to contribute to class discussion (Norman and Schmidt, 2021).

Lecture Method.

Lectures usually take place in a classroom format in first world secondary schools. It is also referred to as talk and chalk or textbook method (Burris and Garton, 2017). This method is teacher centered with little participation from learners. The teacher is seen as the repository of all knowledge while the students are passive recipients of knowledge transmitted by the teachers in the learning process (Ozer, 2020). Properly structured lectures may be the best teaching method especially when suited to the transmission of conceptual and systematic knowledge. In different studies, the major advantage of the lecture method is the ability to get a huge amount of information to a lot of people in a short amount of time although retention of the information might be a challenge due to beneath explanation of subject content. In the context of the current study, this method is the least effective in helping students to get agriculture practical skills for sustainable agricultural production to improve food security (Van Mele et al., 2019).

2.4 Summary of literature.

In this chapter, the researcher has reviewed literature on the status of Modern Agriculture in schools, challenges facing learning of Modern Agriculture in schools. Literature has revealed that the challenges facing the teaching of Modern Agriculture revolve around the characteristics of the teaching staff, students' characteristics and teaching and learning process. This study sought to fill the existing gaps in the literature on the challenges facing teaching of Moderns Agriculture in Secondary schools.

CHAPTER THREE.

METHODOLOGY.

3.0 Introduction.

Kothari (2014) defines research methodology as a way of systematically solving a research problem. This involved various steps that were followed by the researcher during the study. The chapter provided the research design, the study area, the target population, sampling procedure, methods of data collection and Data Collection Instruments, Data Quality Control (Validity & Reliability), Research ethical considerations, data Analysis and measurement of the Variables.

3.1 Research design.

According to Kothari (2014), research design is a plan, a roadmap and blueprint strategy of investigation conceived so as to obtain answers to research questions. It is another words, a procedural plan that was adopted by the researcher to answer research questions objectively, accurately and economically. This study used a cross-sectional survey design which adopts mixed methods as this helped to captured qualitative and quantitative information. A cross-sectional study predominantly used structured questionnaires and interview schedule for data collection with the intent of generalizing from a sample to a population. It was the most frequently used method for collecting information about habits or any of the variety of social issues related to education. A survey design was appropriate because it enabled the researcher to obtain pertinent and precise information from the respondents to establish the relevancy of modern agriculture education on students farming practical skills in secondary schools in Kabujogera Town council, Kitagwenda district. The design was deemed appropriate in that it helped the researcher to gather information across a large population with the aim of describing events as they happen. The design adopts both quantitative (statistical) and qualitative (attitudes

and opinions) approaches for data collection. These approaches made it possible to investigate the phenomenon in the area.

3.2 Area of study.

The study was conducted in Kabujogera Town council, Kitagwenda district.

3.3 Target population.

The target population for this study was students from agriculture class from senior one to senior six, agriculture teachers, school administrators in three selected schools in Kabujogera Town council, Kitagwenda district which was purposively selected. The schools selected were both private and public and these included; Kitagwenda High school, Ave Maria secondary school, and ST. Stelamaris girls' secondary schools.

Table 3.1: Sample population distribution.

Category.	**Estimated population.**	**Sample size.**	**Sampling method.**
Agricultural students	645	225	Simple random sampling
Agriculture teachers	16	16	Purposive sampling
School administrators	09	09	Purposive sampling
Total	**670**	**250**	

3.4 Sample size determination.

The sample size was determined by Kish and Leslie (1965) formula. According to the formula, the sample size was determined with some degree of precision of the general population used.

$$n = p \times q \times \left(\frac{Z}{e}\right)^2 \quad \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots(1)$$

Where: n = Sample size; p = population proportion of teachers = 39% = 0.39; q = students population proportion = 42% = 0.42; e = standard error = 5% = 0.05; and $Z_{1/2}$= Z value of 95% confidence = 1.96 from the Z-table. Substituting the values into the formula:

0.39 xo.42 $[1.96/0.05]^2$

n = 250 respondents.

3.5. Sampling techniques.

The study used simple random sampling and purposive sampling techniques. Simple random sampling is where each and every item in the population has an equal chance of inclusion in the sample (Kothari, 2014). Simple random sampling was used to select agricultural students from senior one and six from selected schools in the Kabujogera town council and every student had equal chance of being selected.

Purposive sampling is the deliberate selection of particular units of the population for constituting a sample which represents the universe. Purposive sampling was employed to select secondary schools agriculture teachers and some administrators were also purposively selected because they were believed to be having high level of agriculture knowledge offered to students under investigation and administrators were considered because they had knowledge on students' enrollment and performance records.

3.6 Data collection methods.

Data collection methods are specific approaches that are applied to obtain information on the research problem. The study employed both primary and secondary data collection methods explained below:

3.6.1 Primary data collection methods.

The primary data is the information collected afresh and for the first time, and thus happen to be original in character (Kothari, 2004:95). The researcher used primary data collection methods by obtaining information for the directly from the respondents hence being original.

3.6.2 Secondary data collection methods.

The secondary data is gathering information from already existing sources which had already been collected by someone else and which had already passed through the statistical process (Kothari, 2014). This supplemented the primary methods and is expected to provide the researcher with an opportunity to gain more information about the phenomenon. The researcher also reviewed the different teaching aids or text books used by teachers, review of high visibility journals, published and unpublished thesis to collect secondary data was also considered.

3.7 Data collection instruments.

3.7.1 Questionnaires.

A structured questionnaire with both (closed and open-ended questions) will be designed and then used to collect data from students. This method allowed a selected number of respondents to answer questions related to the study phenomenon. The questions to be answered in the questionnaire were in line with the study objectives. The questionnaires were administered by the researcher himself. Primary data will be captured on;

Section A; Socio-demographic characteristics like sex, age, education level, school farm size and among others, Section B; different methods used to teach modern agriculture in secondary schools,

Section C; challenges experienced in modern agriculture education and Section D; strategies to enhance modern agriculture education in order to improve practical skills among secondary students.

3.7.2 Interview guide.

An interview guide involves the presentation of oral verbal stimuli and replies in terms of oral verbal responses. Oral personal interviews that involve a face to face contact or conversation using an interview guide was used to capture opinions and views from key informants like

school administrators. Interviews helped in capturing supplementary information on the subject under investigation. Interviews also help to generate first hand and reliable data. For the respondents who did not give immediate feedback, adequate probing was used to establish the specific information regarding the study phenomenon.

3.8 Quality Control Methods.

3.8.1 Content Validity of Instruments.

According to Polit and Hungler (2015), validity refers to "the degree to which the instrument measures what it is supposed to be measuring". Validity was ensured by examining the instruments. Before administering the questionnaires to the respondents, they were first examined by colleagues taking the same program as the researcher. They were then scrutinized by the research supervisor. This ensured that the terms used in the questionnaire are precisely defined and properly understood. The instruments were pilot tested on a population of 10 respondents outside the sample. The draft questionnaire was subjected to expert judgment to verify the validity of the questions where the researcher used the Content Validity Index (CVI).

The researcher distributed an initial draft questionnaire to ten experts in agriculture department in selected schools. The Content Validity Index (CVI) was then determined by the formula and the workings below.

$$CVI = \frac{\text{Number of items considered valid}}{\text{Number of items on the draft questionnaire and the interview checklist}}$$

A CVI of 0.7 and above for any instrument was considered valid for the study in accordance with Amin (2005). All questions deemed not valid were edited or dropped per the recommendation of the experts.

3.8.2 Reliability of Instruments.

Reliability refers to the degree at which the instrument consistently measures what it is measuring (Westercamp M. 2013). A number of measures were taken during fieldwork, subsequent analysis and conclusion process was done in order to ensure the quality of the instruments. Before the actual collection of data, instruments were also pre-tested on 10 - 20 respondents across the schools in the Kabujogera town council to determine the reliability and these respondents were not part of interviewees. The reliability of the questionnaires in relation to the consistency of the respondents' answers was computed using the Cronbach Alpha Coefficient as shown below;

The formula for Cronbach's Alpha used was as follows:

A Cronbach's Alpha = $(n/ n-1) (SD^2 - \sum Variance)/SD^2$

where: n= Number of items on the test

SD= The Standard Deviation for the set of test scores, and ∑Variance = Summation of the variances of the scores for each of individual item on the test. A Cronbach's Alpha of 0.7 and above showed that the instruments were reliable. The higher the reliability coefficient, the higher the reliability of the instrument.

3.9 Ethical clearance and consideration.

- The proposal was submitted to Bishop Stuart University, Research Ethics Committee for ethical approval and clearance.
- The most essential ethical issues that needed to be clearly and thoroughly addressed in this study comprised of informed consent, privacy and confidentiality, anonymity and researcher's responsibility.
- The study was conducted in a humane manner and all the participants were treated with dignity and due respect.

- The researcher permitted sufficient time to explain to the respondents, the objective and purpose of the study, and how the data collected was used and what was expected of them in the study.
- For privacy and confidentiality and anonymity, the participants were assured that their identities or names remained confidential and secret. In other words, their names were never released or published in any manner; and the information being collected from the participants was not violating their private life.
- The researcher avoided using biased language in any form because it was unethical to invent or to bend findings in any ways or for any purpose. The competence of the researcher was guaranteed by his knowledge and skills in giving the valid and reliable feedback.

3.10 Data Analysis.

Data was analyzed using two principal methods that is qualitatively and quantitatively as discussed below;

3.10.1 Qualitative data analysis.

The qualitative data was collected through the use of both open-ended questions and interview guide. Data was analyzed after coding responses. Qualitative responses captured were arranged under themes. This was done to search for the relationship between various codes. To avoid value judgment and/or bias, the researcher carefully analyzed the information by consciously cross-checking and was in a position to interpret the findings objectively. The results were best reported in form of verbatim statements got from key informants.

3.10.2 Quantitative data analysis.

Quantitative data from questionnaires were collaborated during data analysis. Data collected was coded, entered and cleaned using the excel computer program which was later be exported to Statistical Package for Social Scientists (SPSS), Version 22.0 for analysis. Both descriptive and

inferential statistics were generated and used in interpreting results. Continuous variables were analyzed using mean and standard deviation while frequencies and percentages were applied on categorical variables. Multivariate analysis using correlations and regression statistics were performed to assess the possible associations between variables and significant relations with the dependent variables.

3.11 Measurement of variables.

The study variable was measured at three levels: Univariate, Bivariate and Multivariate.

3.11.1 Univariate Level.

At the Univariate, the researcher gave a full description of a single variable and its attributes. Hence, frequency tables were used to present data and give a descriptive and inferential analysis of the variables.

3.11.2 Bivariate Level.

At bivariate level, the researcher established the relationship between the Independent variable (modern agriculture education) and the dependent variable (students farming practical skills). The bivariate level involved considering two variables at the same time and also involved correlation of dimensions of the both study variables using correlation coefficients. The decision rule was set at 5% level of significance which accepted precision level in socio-economic research.

3.11.3 Multivariate Level.

All the independent variables that were tested significant at bivariate level were analyzed using a regression analysis to measure their net effects of independent variable on the dependent variable. This was a typical measurement that established the relationship between the independent variable and dependent variable. It was essential to determine the percentage effect or effects of each dimension the independent variable (modern agriculture education operations) to the dependent variable (students' farming practical skills).

3.12. Study limitations.

The researcher experienced a number of limitations in the course of carrying out the research; these were;

Financial constraints: Being self-sponsored student, the researcher experienced financial hardship during his research process.

Time constraint: The study demanded a lot in a limited time, plus other demanding academic issues such as tests and exams.

Slow response and non-response from some of the respondents: Since some respondents claimed to be very busy and others were not available at all while others are expected to be jealous.

The researcher was denied access to some information which was expected to be confidential.

Weather changes, heavy rains and strong sunshine during data collection period were experienced.

CHAPTER FOUR.

ANALYSIS, PRESENTATION AND INTERPRETATION OF THE FINDINGS.

4.1. The Response Rate.

The researcher administered 250 questionnaires to the respondents and only 248 were filled and then collected for coding and analysis making a response rate a significant one basing on the 50% a minimal value as prescribed by Mugenda and Mugenda's (2003). This commendable response rate was possible because the researcher personally administered the questionnaire and made further visits to collect the filled questionnaires.

4.2 Socio-economic characteristics of farmers.

Information was gathered on key demographic characteristics like; gender, age, education level and marital status. The features were studied to clearly depict the diverse background of respondents who both teach and learn modern agriculture methods.

Table 4.1*:* Socio-economic characteristics of farmers.

Variable	Category	Frequency	Percentage
Gender	Male	128	52
	Female	120	48
Marital status	Never married	232	94
	Married	13	5.2
	Divorced	03	1.2
	Minimum	Maximum	Mean ± SD
Age in years	15	60	35.84 ± 8.229
Education in years	8	16	10.72 ± 4.169

4.2.1 Gender.

As shown in Table 4.1 above, 52% of the respondents were male and 48% were female. The dominance of males in the study depicts the laborious nature of modern agricultural education

technologies which are taken to be more of male rated than female. Females are however more involved in teaching other modern agriculture activities which they practice better than male counterparts like animal feeding, crop planting, weeding and harvesting.

4.2.2 Marital status.

Results also indicated that the majority of the respondents were single 94%, and 5.2% were married, 1.2% were divorced and neither of the respondents were widowed. The dominance of single couples in the study is explained by the fact that agricultural students are the ones involved more in agriculture education to generate enough knowledge and skills.

4.2.3 Age of respondents.

Mean age distribution among respondents was 35 years with the youngest aged 15 and the oldest 60. Most respondent's surveyed belonged to productive age of 17-35 years which is a young vibrant productive age group hence justifying their active involvement in modern agricultural education to sustain their livelihoods. The dominance of productive young age was due to majority of the populations being students.

4.2.4 Education level.

Average number of years in school were ten (senior three) with a minimum of 8 and a maximum of 16 years (university degree). A bigger part of the study respondents were still secondary education students. This perhaps explains the uptake and use of modern agricultural education to help them acquire adequate agricultural related practical skills in the area. This level of literacy was an indication that the agricultural education has attracted highly educated people yet level of education is very important in that it influences decision making, enhances information access and faming practical skills among students.

4.2.5 School land holdings.

The study sought to identify size of the land in acres under agriculture the school has. The results are presented in figure 4.2 below;

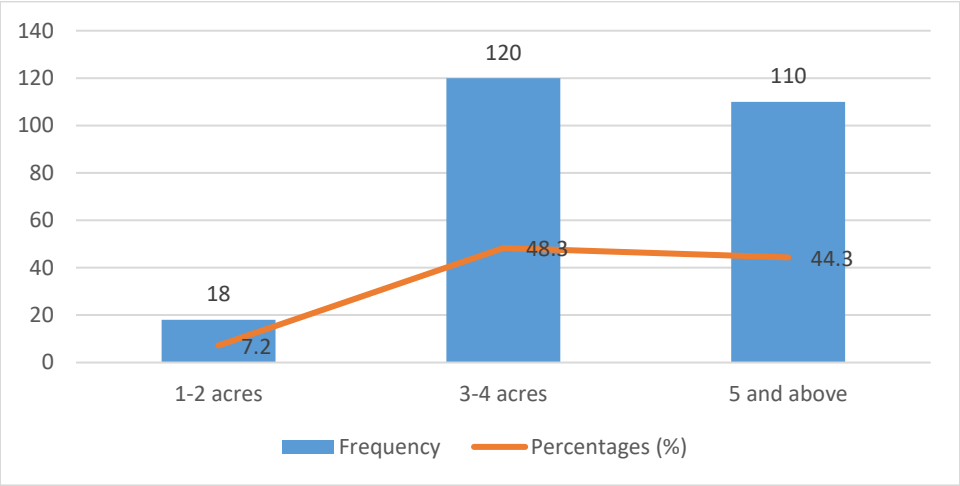


Figure 4.2: Showing the size of the land in acres.

The study results revealed that majority of the respondents 120 (48.3%) had 3-4 acres of land under agricultural production, 110 (44.3%) revealed 5 acres and above, 18 (7.2%) revealed 1-2acres. This implied that agricultural students had where to transform their modern agricultural theories into agricultural practical sessions to enhance their farming practical skills.

4.3 Different methods of Modern Agriculture taught in secondary schools in Kabujogera Town council, Kitagwenda district.

Table 4.2: Whether there were enough agricultural modern equipment to use during practical sessions.

Category	Frequency	Percent
Yes	246	99
No	02	1.0
Total	248	100

On whether there were enough agricultural modern equipment, 99% of the respondents replied yes while 1.0% of the respondents said no.

The study sought to ascertain the agricultural modern equipment used in secondary schools in Kabujogere Town council. The results of the analysis are summarized in Table 4.3.

Table 2.3: Modern agricultural equipment to use in secondary schools (multiple responses)

	Category	Frequency	Percent
Valid	Irrigation pumps and guns	49	13.5
	Castration equipment	80	22
	Inorganic and organic fertilizers	105	28.8
	Mechanization equipment	31	8.5
	Dehorning equipment	63	17.3
	Soil pH indicator solution	36	9.9
	Total	364	100.0

As can be seen from table 4.3. Majority 28.8% of the respondents mentioned Inorganic and organic fertilizers, 22% talked of castration equipment like forceps and elastrator tools, 13.5% revealed irrigation pumps and guns, 17.3% talked of dehorning saw and iron, 9.9% talked of Soil pH indicator solution while the least number of respondents 8.5% talked of mechanization equipment like sprayers and harvesters. The study results implied that secondary schools are teaching students modern agriculture to students due to the availability of agricultural equipment in schools.

Table 4.4: Whether the schools teach modern agricultural methods to agricultural students

Category	Frequency	Percent
Yes	248	100
No	00	00
Total	248	100

On whether the schools teach modern agricultural methods to students, 100% of the respondents replied yes while nether of the respondents said no. This implied that students' practical skills have been improved due to constant teaching of modern agricultural methods.

Table 4.5: Correlation Coefficients between Modern agricultural methods and improvement of farming practical skills.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Beta	Std. Error	Beta		
(Constant)	9.546	0.443		21.563	0.000
Monoculture	-0.542	0.466	-.076	-0.62	0.246
Utilization of modern agricultural inputs	0.844	0.301	.134	2.804	0.05
Pre and Post-harvest handling	0.377	0.133	.132	2.845	0.04
Use of irrigation equipment	0.469	0.165	.146	2.808	0.05
Use of biotechnology	-0.256	0.325	-.068	-0.793	0.428
Use of improved farm machines	0.710	0.230	.131	3.920	0.03

Sig. ($p \leq 0.05$) represents significant relationship between the variables.

Based on the coefficients in table 4.6, modern agricultural methods statistically affect students farming practical skills. Utilization of modern agricultural inputs had a positive significant effect ($t = 2.804$, p value < 0.05) on farming practical skills among students. A unit increase in use of inputs leads 84.4% increase in improving students practical skills. Pre and post-harvest handling had a positive and significant influence on student's practical skills as given by ($\beta = 0.377$, $t = 2.845$, $p<0.04$). The implication of this finding was that a unit increase in pre and post-harvest handling practices would lead to increased skills improvement among students by 37.7%. Use of irrigation equipment had a positive and a significant influence on students farming practical skills as given by ($\beta = 0.469$, $t = 2.808$, $p<0.05$). Use of improved farm machines had a strong and positive significant effect ($t = 3.92$, p value < 0.03) on farming practical skills among students. Monoculture and use of bio-technology showed non-significant results as far as improving student's practical skills is concerned.

In an interview conducted with one of the key informants, it was reported that "*Our school organizes workshops and training sessions with agricultural experts and local farmers who are knowledgeable about modern farming practices. These sessions cover topics such as the use of bio-pesticides, soil testing, sustainable farming practices and among others. These workshops are very interactive and provide us with the opportunity to ask questions and clarify doubts. They enhance our understanding of modern agricultural practices and their application*"

4.4 Challenges experienced in modern agriculture education in secondary schools in Kabujogera Town council, Kitagwenda district.

This section of the study addresses research objective two that intended to investigate the challenges experienced in modern agricultural education in the study area. Information on key challenges was gathered and analyzed using logistic regression as in table 4.6 below.

Table 4.6: Parameter estimates for the challenges experienced in modern agricultural education in secondary schools.

Variables	Value	AOR (95% C.I)	P-value
Limited modern agricultural in puts	Yes	0.978 (0.169 - 54.570)	0.001
	No	1	
Lack of resources to use	Yes	0.333(0.104 - 34.088)	0.005
	No	1	
Poor motivation among students and teachers	Yes	0.676 (0.150 - 76.330)	0.003
	No	1	
Lack of technical expertise	Yes	1.808 (0.818 - 28.267)	0.142
	No	1	
Poor school infrastructure	Yes	2.122 (0.103 - 6.113)	0.235
	No	1	
Limited school farm size	Yes	0.943 (1.121 - 45.518)	0.001
	No	1	
Poor time management	Yes	0.322 (0.103 - 3.514)	0.130
	No	1	
Poor learning environment	Yes	0.858 (0.218 - 3.267)	0.004
	No	1	

Source*:* computer output (SPSS version 22) analysis, 2023.

Results of the logistic regression model of challenges experienced in modern agricultural education in secondary schools in Kabujogera Town council were presented in table 4.6.

The log odds explained the probabilities of the outcome as a result of limiting explanatory variables. Significant challenges were interpreted at 95% confidence interval and 5% level of significance. Of the eight (8) challenges postulated, only five (5) challenges remained significant and these included; limited modern agricultural in puts, poor school infrastructure, poor motivation among students and teachers, limited school farm size and poor learning environment

Limited modern agricultural in puts was a significant challenge associated with the modern agricultural education and improvement of students farming practical skills. Schools with limited agricultural in puts were 0.97 times less likely to improve students' farming practical skills [AOR = 0.978; (95% CI: 0.169 - 54.570, p = 0.001].

Lack of resources to use presented as significant challenge towards modern agricultural education. Schools with limited resources were 0.3 times less likely to improve students' farming practical skills compared to those with adequate resources [AOR = 0.333; (95% CI: 0.104 - 34.088, p = 0.005].

Poor motivation among students and teachers was a significant predictor in modern agricultural education and students farming practical skills at 5% level of significance. Secondary schools with poor motivation were 0.676 times less likely to improve students' farming practical skills compared to those with better motivation [AOR = 0.676; (95% CI: 0.150 - 76.330, p = 0.003].

Limited school farm size had a significant influence on modern agricultural education at 5% level of significance. Schools with small farm size were 0.94 times less likely to improve students farming practical skills compared to those with large plots [AOR = 0.943; (95% CI: 1.121 - 45.518, p = 0.001].

Lastly poor learning environment acted as another significant challenge in modern agricultural education in secondary schools in Kabujogera town council at 5% level of significance. The poorer the learning environment, the lower the chances of improving students farming practical skills. In other words secondary schools which had poor learning environment were 0.86 times less likely to improve students' farming practical skills [AOR = 0.858; (95% CI: 0.218 - 3.267, p = 0.004].

Other challenges like poor school infrastructure, lack of technical expertise and poor time management respectively were not significant challenges at [p = 0.23, p=0.142, p=0.130].

In an interview conducted with one of the key informants (school administrators) on major challenges, it was reported that "*One of the biggest challenges we face is the lack of sufficient funding. Modern agricultural education requires substantial investment in infrastructure, such as demonstration farms, greenhouses, and modern farming equipment. Unfortunately, our budget is limited, which hampers our ability to provide students with the necessary tools and facilities for hands-on learning*"

In another interview conducted with one of the head teachers, it was reported that "*the overall infrastructure in our school is inadequate. Classrooms and laboratories are often not well-equipped, and there is a lack of space for practical activities. The absence of proper facilities hampers our ability to conduct effective practical sessions, which are essential for modern agricultural education*".

4.5 Strategies to enhance modern agriculture education in order to improve practical skills among secondary students.

Table 4.7: Whether students are given enough time for agriculture practical sessions

Category	Frequency	Percent
Yes	245	98.8
No	03	1.2
Total	248	100

On whether students are given enough time for agriculture practical sessions, 98.8% of the respondents replied yes while 1.2% of the respondents said no.

The study sought to ascertain how often students learn agricultural practical session in a term, responses were captured and results are presented in table 4.8;

Table 4.8: How often students learn agricultural practical session in a term.

Category	Frequency	Percent
Every weekend	05	02
Daily basis	03	01
Twice a month	190	77
Thrice a term	50	20
Total	248	100

The study results revealed that majority of respondents constituting to 77% said that agricultural practical sessions are learnt twice a month in a term, 20% revealed learning agricultural practical sessions thrice a term, 2% revealed every weekend and 1% revealed daily basis.

Table 4.9: Regression output for the strategies to enhance modern agriculture education.

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
	(Constant)	17.913	1.845		9.709	.000
	Agriculture tours and field trips	3.029	1.036	.136	1.795	.027
	Class discussion student involvement	2.025	1.232	.158	2.792	.029
	Use of student centered approach	-.056	.070	-.126	-.796	.427
	Use of practical demonstration method	4.066	1.152	.201	-2.273	.004
	Extra funding to agriculture education	-.193	.214	-.114	-.900	.369
	Recruitment of experienced agriculture teachers	2.216	1.199	.166	1.083	.028

Regression results for the strategies to enhance modern agriculture education to improve on practical farming schools were presented in Table 4.9 above. Among the six hypothesized strategies, four were found to be statistically significant. These included; agriculture tours and field trips (p=.027). This strategy had a significant influence on improving students farming practical skills by 3.02 chances. Class discussion student involvement (p=.029), this strategy had a significant influence on improving students farming practical skills by 2.02 chances. Use of practical demonstration method (p=.004), this strategy significantly contributed to improving students farming practical skills by 4 chances and recruitment of experienced agriculture teachers (p=.028), this strategy has strong significant association with improvement of students' farming practical skills. Use of student centered approach and extra funding to agriculture education had no significant influence in improving students' farming practical skills at 5% level of significance; (p=.427; p=.369).

In an interview conducted with some key informants (school administrators), it was reported that "*Our school has a demonstration farm where students practice various modern agricultural techniques/practices. This hands-on experience is invaluable as it allows them to apply what they learn in*

the classroom directly to real-life farming. For example, they have been learning about crop rotation, intercropping, and the use of organic fertilizers. Working on the demonstration farm helps them understand the practical aspects of these methods and see the results firsthand".

CHAPTER FIVE.

DISCUSSION, CONCLUSION AND RECOMMENDATIONS.

5.0 Introduction.

The study was conducted to assess the relevancy of Modern Agriculture Education on students' farming practical skills in secondary schools in Kabujogera Town council, Kitagwenda district. This chapter presents the discussion of major findings, conclusions and recommendations in line with the study objectives. This chapter further highlights the areas suggested for further research.

5.1 Discussion of findings.

5.1.1 Different methods used to teach Modern Agriculture in secondary schools in Kabujogera Town council, Kitagwenda district.

The study results revealed utilization of modern agricultural inputs (t =2.804, p-value = 0.05). This showed a significant influence in improving students' farming practical skills by 84%. The inputs revealed were like fertilizers, agrochemicals and improved seeds as this help to create awareness to agricultural science students on modern inputs available to them for efficient farm productivity. This demand will also in turn enables agricultural science teachers participate in agricultural extension activities from the schools. This finding is in agreement with Foster et al., (2015) who in their study reported that effective application of fertilizers and pesticides remains to be a big challenge in agriculture especially when it comes to the determination of what fertilizer works best for different plans, when to apply, as well as at what quantities. The same authors revealed that use of crop sensors can make it easy for farmers to effectively apply fertilizers and pesticides just as much as the crops need.

The study results revealed use of improved farm machines (t =3.92, p value < 0.03). This had significant influence on improving students' practical skills by 71%. This implied that students had higher chances of improving on their skills since the study of farm machine use was more of hands on than theory. This finding can be compared with Kathuri, (2018) who in his study

revealed that there is an increasing cost of labor, which calls for better approaches to ensure less cost on labor. The same author explained that introduction of combined harvesters and planters simplifies the process as these machines would be operated by one person to yield adequate output in shortest time possible. The use of modern technology in agriculture ensures that farmers grow vast food within the shortest time possible.

The study results also revealed use of biotechnology which showed no significant association with improving students' farming practical skills because respondents/students revealed that biotechnology is more of theory than practical and this was attributed to limited resources to use that are related to use of biotechnology in farming. This finding is in line with Annor-Frempong, (2020) who explained that genetic engineering/biotechnology is carried out to increase the resistance of certain crops to farm inputs such the application of herbicides. The same author reported that through biotechnology, farmers can plant on areas that were otherwise considered dry or deserts. The results further hoped to achieve among others, two important goals profitable economy and better output.

5.1.2 Challenges experienced in modern agriculture education in secondary schools of Kabujogera Town Council, Kitagwenda district.

The study results revealed lack of resources to use presented as significant challenge towards modern agricultural education. Secondary schools with limited resources were 0.3 times less likely to improve students' farming practical skills compared to those with adequate resources at [AOR = 0.333; p = 0.005]. Results further revealed that agriculture latest text books are in scanty and this has lessened students' chances of improving skills because they have limited theory that could be transformed to practical part of agriculture. This finding is consistent with Andola (2012) who in his survey found out that there were few agriculture textbooks compared to the number of agriculture students in class. The same author reported that ratio appeared to be

one text book per every three students. In addition to using textbook, teachers should use teaching aid to facilitate their teaching of modern agriculture. Most of the agriculture textbooks place a lot of emphasis on un contextualized grammar and vocabulary presentation which lacks rational relevance or context. This finding also concurs with Eshiwani (2018) who revealed that most schools perform poorly because they do not spend significant amount of money in buying of teaching and learning resources for agriculture practical education, adequate relevant teaching and learning resources make teaching and learning interesting to the learners.

Poor motivation among students and teachers was a significant predictor in modern agricultural education and students farming practical skills at 5% level of significance. Secondary schools with poor motivation were 0.676 times less likely to improve students' farming practical skills compared to those with better motivation [AOR = 0.676, p = 0.003]. This finding can be compared with Gardner & Lambart, (2017) who in their study revealed that student progressive performance in school is determined by his or her motivation by teachers and parents. The same authors explained that student who is highly motivated will tend to outperform his fellow students. Any teacher's effort will mean little if he/she does not appreciate the importance of motivating the student to learn. The subject matter being taught by the teacher should appeal to the student's personal academic and professional goals.

The study results indicated that poor learning environment acted as another significant challenge in modern agricultural education in secondary schools in Kabujogera town council at 5% level of significance. The poorer the learning environment, the lower the chances of improving students farming practical skills. In other words secondary schools which had poor learning environment were 0.85 times less likely to improve students' farming practical skills [AOR = 0.858; p = 0.004]. This finding can be compared with Jessy and Charu, (2019) who in their study established that the environment of a given school plays a significant role in the teaching

processes. In areas where there is insecurity learners can never concentrate in class. The climate of the area also affect the teaching and learning of agriculture as a subject. Teachers are supposed to develop conducive training environments of their students by holding symposium in the school, having agriculture clubs and remedial teaching. The favorable environment play a role in the teaching and learning process of agriculture. This finding also agrees with Hammer (2018) who says parents can largely affect performance of their children when they provide them with favorable study environment at home.

The study results revealed poor time management was among non-significant challenges at [p= 0.23]. Respondents revealed that the amount of time allocated to a given subject has some effect on learner's understanding of what is being taught. This finding can be compared with World Bank (2018) which says in his study that overcrowding in agriculture lessons and overloading of agriculture teachers affects their performance and efficiency in teaching agriculture. He continues to say that agriculture lessons were mostly taught in afternoon, when student are tired and cannot absorb much of what they are taught during afternoon hours as this renders them from mismanaging time.

5.1.3 Strategies to enhance modern agriculture education in order to improve practical skills among secondary students.

The study results revealed emphasizing agriculture tours and field trips. This strategy had a significant influence on improving students farming practical skills at (p=.027). This finding can be compared with Diise et al., (2018) who in their study reported that field trips to agricultural centers, industries, farmlands, etc., where students get firsthand experience and practice of the theoretical methods of agriculture, can prove to be very helpful. However, assignments, write-ups, and projects must be given to students to aid them to participate effectively in the field trips to enhance hands on practical skills. The same authors explained that field trip is one of the most

complex and expensive activities in the educational system and hence should be planned as an integral part of the curriculum rather than as an isolated activity.

The study results established that class discussion student involvement had a significant influence on improving students farming practical skills as this is a primary teaching method in agriculture allows the teacher to stimulate critical thinking on the learners. This finding is in line with Olowa, (2019) who explained that this strategy also helps the teacher establish a rapport with the students, demonstrating an appreciation of their contributions and challenging them to think more deeply and to articulate their ideas more clearly. The same authors revealed that through class room discussions, a set of acquired skills that is necessary for establishing and developing interpersonal relationships such as communication skills, cooperation, emotional intelligence, and critical thinking is developed.

The study results revealed use of practical demonstration method, this strategy significantly contributed to improving students farming practical skills at (p=.004). This finding concurs with Smith et al., (2020) who revealed that this method increases students' interest and understanding and consequently promotes high achievement rate. The same authors explained that demonstration procedures in agriculture may include machine milking, how to preserve fish, how to graft a mango tree, or how to install drip irrigation in a home gardens.

The study results also revealed that student centered approach contributes to improvement of students' farming practical skills. This strategy further helped students acquire and apply knowledge and skills to define and solve realistic problems using a process of extended inquiry. This finding agrees with Anderson et al., (2016) who in their study reported that class projects are therefore student-centered, following standards, parameters, and milestones clearly identified by the teacher. The same authors revealed that project teaching method is based on the conviction that learning by doing, discussing in groups, and revisiting ideas and experiences are

superior ways of gaining a better understanding of one's environment. This finding also concurs with Shoulders, & Myers, (2019) who established that practical work though class projects makes learning more enjoyable and their purposes in agricultural education have expanded beyond skill acquisition and proficiency to include personal development for diverse career preparation beyond agriculture.

5.2 Study conclusion.

The study concluded that modern agricultural methods had significant relationship with improving students' farming practical skills in secondary schools of Kabujogera Town council in Kitagwenda district. Significant methods included; utilization of modern agricultural inputs, use of improved farm machines, pre and post-harvest handling, and use of irrigation equipments.

The study further concluded that there were significant challenges experienced in modern agriculture education in secondary schools of Kabujogera Town Council, Kitagwenda district. These included; limited modern agricultural in puts at [p = 0.001], lack of resources to use [p = 0.005], poor motivation among students and teachers [p = 0.003], limited school farm size [p = 0.001] and poor learning environment [p = 0.004].

The study finally concluded that strategies to enhance modern agriculture education had significant association with improving student's farming practical skills. Such strategies were; agriculture tours and field trips (p=.027), class discussion student involvement (p=.029), use of practical demonstration method (p=.004) and recruitment of experienced agriculture teachers (p=.028).

5.3 Study recommendations.

Based on the findings of this study, the following recommendations were made:

There should be training and re-training among teachers and students of agricultural science on use of modern agricultural technology for teaching and learning in secondary schools.

The government should provide necessary inputs and farm machineries for teaching and learning agricultural science.

Secondary schools should ensure establishment of enough demonstration farms that students would constantly visit in order to copy much on how to do agriculture practical work to improve their skills and experience.

Agricultural science students should go for field-trips and excursion in technology oriented farms to enhance to further boost their motivation from agriculture.

Government should fund and invest in agricultural education program in secondary schools particularly private ones so as to equip student- teachers of agriculture.

Agricultural teachers need to learn early in their careers that to be effective in their teaching they must provide a dynamic experience for their students. These experiences are gained through networking with resources outside the typical classroom setting, professional relationships give the teachers content and opportunities for student to engage in relevant hands-on learning.

5.4 Areas for further research.

The study recommends further research on;

The influence of modern agricultural technology on improving students' practical skills in higher institutions of learning in south western Uganda.

The relevance of agricultural instructional materials on improving modern agricultural education both in lower and higher institutions of learning in south western Uganda.

Further research should finally be done on how modern agricultural education programs may be designed to support innovative agricultural content in Secondary schools of Kitagwenda district.

REFERENCES

Anderson, J., Learch, C., & Gardner, S. (2016). National survey and segmentation of smallholder households in Uganda. Understanding their demand for financial, agricultural and digital solutions.

Ayot, U and Patel, P.P, (2018). Education and agricultural efficiency in Nepal (Working paper no.822-03). Washington D.C.: World Bank.ss

Darko, R. O., Yuan, S., Simmons, K., Abbey, A., Liu, J., & Kumi, F. (2016). Constraints encountered in teaching practical agriculture in selected senior high schools in the Sekondi-Takoradi metropolis.

UNESCO (2019) Uganda: An overview. Education in East and Central Africa. London: Bloomsbury.

Nzarirwehi, J. (2018). In-service teacher training and students' attainment of education in secondary schools in Western Uganda Kampala International University.

Okillan & Asianut, G. (2021). Enhancing students' hands-on experiences in the acquisition of integrated production skills at Shimoni Core secondary teachers' college, Wakiso district in Uganda Kyambogo University].

Okiror, J. J., (2017). Towards in-service training needs of Secondary school agriculture teachers in a paradigm shift to outcome-based education in Uganda. The Journal of Agricultural Education and Extension, 23(5), 415-426.

Tamburini, G., De Simone, S., Sigura, M. (2016) Conservation tillage mitigates the negative effect of landscape simplification on biological control. Journal of Applied Ecology, 3: 233-241.

Horton, Michelle (2019). "Reduced soil tilling helps both soils and yields". Stanford News. Retrieved 8 December 2019.

Tayyab, M, (2021). "Sugarcane monoculture drives microbial community composition, activity and abundance of agricultural-related microorganisms". Environmental Science and Pollution Research. 28 (35): 48–86.

FAO. (2014). Youth and agriculture: Key challenges and concrete solutions. Rome: Food and Agriculture Organization of the United Nation.

Elder, S., & Rosas, G. (2015). Global employment trends for youth 2015: Scaling up investments in decent jobs for youth. Geneva: International Labour Organization.

Uganda Bureau of Statistics. (2016).The national population and housing census 2014.Main

report. Kampala.

Tumuheki, P. (2017). Lifelong learning in practice: Understanding and enabling meaningful participation of non-traditional students in university education in Uganda. Groningen: Globalisation Studies Groningen.

Ministry of Education and Sports. (2015). Skilling Uganda: BTVET strategic plan: 2015/13 to 2021/2. Kampala.

Shoulders, & Myers. (2019). Effective professional development in agri-science education: an examination of core features. Journal of Agricultural Education, 55(1), 167.

Brand, B. V., Andrew; Browning, Andrea. (2018). How Career and Technical Education Can Help Students Be College and Career Ready: A Primer

Smith, L. M., Zhu, L., Lerman, K., & Kozareva, Z. (2020). The Role of Social Media in the Discussion of Controversial Topics. International Conference on Social Computing. doi:10.1109/socialcom.2020.41

Foster, D. D., Masser, Douglas T., Falk, Jeremy M., Sankey Rice, Laura L. (2015). Utilization of Advisory Councils in Pennsylvania Secondary Agricultural Education Programs. Career and Technical Education Research, 40(3), 141.

Eischen, D. (2017, June 15). Pledge to Buy Virginia Grown, Support Your Local Economy. Retrieved April 16, 2018, from http://www.vdacs.virginia.gov/press-releases-170615-vg.shtml.

Eischen, D. (2017, June 15). Pledge to Buy Virginia Grown, Support Your Local Economy. Retrieved April 16, 2018, from http://www.vdacs.virginia.gov/press-releases-170615-vg.shtml.

Osborne, A and Collins. S, (2018). “Pupils’ views of the role and value of the science curriculum: a focus-group study,” International Journal of Science Education, vol. 23, no. 5, pp. 441–467.

Daluba, N. E, (2017). “Effect of demonstration method of teaching on students’ achievement in agricultural science,” World Journal of Education, vol. 3, no. 6, pp. 1–7.

Kurt, S, (2020). “Problem-based learning (PBL),” in Educational Technology in Accra, Egypt.

Laugo, J. (2019). Vocationalized secondary education. In: International Handbook of education for the Changing World of Work. (Edited by Maclean, R. and Wilson, D.). Springer Science + Business Media B.V, Netherlands. pp 2295-2312.

Rayfield, J. M., Tim; Briers, Gary; Lewis, Lauren. (2017). Identifying Innovative Agricultural Education Programs. Journal of career and technical education, 27(2).

Phillip, A.A, (2018). “Effects of discussion instructional strategy on achievement and retention of secondary school students in human geography in Minna, Nigeria,” Journal of Scientific and Engineering Research, vol. 2, no. 4, pp. 78–84.

Jessy, U and Charu, C.C, (2019). “Using social media for educational purposes: approaches and challenges,” in Proceedings of the 2015 International Educational Conference 2015 Learning Technologies in Education at Jamia Millia Islamia, New Delhi, India, 2015.

Joyce, H and Weil, I.A, (2017). Kenya Youth Agribusiness Strategy 2017–2021, Positioning the Youth at the Forefront of Agricultural Growth and Transformation, Government Printer, Nairobi, Kenya.

Ngesa. L.M, (2016).Technological Innovation for Nigeria Fisheries Development. Issues and Analysis. The Nigerian Journal of Agricultural Extension. 5 (1) 27-32.

Adom, H (2020). Contemporary Techniques or Innovations in Teaching Agricultural Science at Secondary School Level, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

Ndawula, A.N & Ngobi, C.N, (2014)Implementing the Next Generation Science Standards. Phi Delta Kappan, 96(6), 45-49.

Mwangi, O.O and Mwai, U.E, (2012).Planning Effective Secondary Professional Development Programs. American Secondary Education, 32(1), 49-6.

Thomasian, J. (2019). Building a Science, Technology, Engineering, and Math Education Agenda. Retrieved from Washington, D.C.

Tschirley , W. M., Young, R. Brent, A, (2015).Sustainability of professional development to enhance student achievement: A shift in the professional development paradigm. Journal of Agricultural Education, 54(4), 13-30.

Olowa, O. W, (2019). “Effects of the problem solving and subject matter approaches on the problem solving ability of secondary school agricultural education,” Journal of Industrial Teacher Education, vol. 46, no. 1.

Williams, M. R. W., (2018). Accessibility and Usage of Technology by North Carolina Agriculture Teachers. Journal of Agricultural Education, 55(4), 191-205.

Ameh, I. E, Daniel, B. P. and Akus, Y, (2018). Agricultural Research and Methods in the Social Sciences, Rowis Press, Ankpa, Nigeria.

Howell, R. T, (2019). “The importance of the project method in technology education,” Journal of Industrial Teacher Education, vol. 40, no. 3.

Diise, U, Zakaria, H and Mohammed, A. A. (2018). “Effectiveness of project method of teaching

on agricultural knowledge and skills acquisition among agricultural science students of Awe Senior High School in the Upper East Region, Ghana," World Journal of Educational Research and Reviews, vol. 4, no. 1, pp. 62–75, 2018.

Jenkins, H and Nelson, N. W. (2015). "Important but not for me: students' attitudes towards secondary school science in England," Research in Science & Technological Education, vol. 23, no. 1, pp. 41–57.

Orodho, J. A. (2018). Techniques of Writing Research Dissertation and Reports in Education and Social Sciences, NRB: Bureau of Educational Researchers, Kenyatta University, Nairobi, Kenya.

Resilient Educator (2020).Three innovative methods of teaching for high school educators, https://resilienteducator.com/classroom-resources/3-innovative-methods-of-teaching.

Norman, G. R and H. G. Schmidt, (2021). "The psychological basis of problem-based learning," Academic Medicine, vol. 67, no. 9, pp. 557–565.

Burris, S and Garton, B. L. (2017). Problem-Based Learning in Secondary Agriculture Classroom: Effect on Critical Thinking and Content Knowledge, Researchgate, Berlin, Germany.

Ozer, E. J, (2020). "The effects of school gardens on students and schools: conceptualization and considerations for maximizing healthy development," Health Education & Behavior, vol. 34, no. 6, pp. 846–863.

Van Mele, J. Wanvoeke, P and Zossou, Z, (2019). "Enhancing rural learning, linkages, and institutions: the rice videos in Africa," Development in Practice, vol. 20, no. 3, pp. 414–421.

Ball, A. and Knobloch, N, (2019). "An exploration of the outcomes of utilizing ill-structured problems in pre-service teacher preparation," Journal of Agricultural Education, vol. 45, no. 2, pp. 62–71.

Hmelo, C. E. (2017). "Problem-based learning: effects on the early acquisition of cognitive skill in medicine," Journal of the Learning Sciences, vol. 7, no. 2, pp. 173–208.

National Center for Education Statistics (2019). "A context report for learning: collaborative groups in the problem-based learning environment," The Review of Higher Education, vol. 23, no. 3, pp. 347–363.

Dods, R. F, (2020). "An action research study of the effectiveness of problem-based learning in promoting the acquisition and retention of knowledge," Journal for the Education of the Gifted, vol. 20, no. 4, pp. 423–437.

Gordon, A. M. Rogers, M. Comfort, N& Gavula, O.I, (2019). "A taste of problem-based learning increases achievement in urban minority middle-school students," Educational Horizons, vol. 79, no. 4, pp. 171–175.

Herman J. M and Knobloch, N.A, (2020). "Exploring the effects of constructivist teaching on students' attitudes and performance," in Proceedings from the 2nd Annual North Central Region, Lafayette, IN, USA.

Njura, I. K. Kaberia, K.K and Taaliu, S. T, (2019). "Effect of agricultural teaching approaches on skills development for food security: a case of secondary schools in Embu County, Kenya," The Journal of Agricultural Education and Extension, vol. 26, no. 3, pp. 239–252.

Albanese, M. A. and Mitchell, S, (2021). "Problem-based learning on practical agriculture," Academic Medicine, vol. 68, no. 1, pp. 52–81.

Hmelo, C. E & Silver, A.T, (2017). "Problem-based learning: what and how do students learn?" Educational Psychology Review, vol. 16, no. 3, pp. 235–266.

Dyer, A and Osborne, E (2016). "Effects of student learning style on short and long-term retention of subject matter using various teaching approaches," Journal of Agricultural Education, vol. 40, no. 40, p. 2.

Krouska, C. Troussas, D and M. Virvou, (2019). "A literature review of social networking- based learning systems using a novel ISO-based framework," Intelligent Decision Technologies, vol. 13, no. 1, pp. 23–39.

Nnodim, A. U. & Raji W.I. (2020). Assessment of Agricultural Technology Adoption Behaviour among Crop Farmers in Ikwerre Local Government Rivers State. Asian Research Journal of Agriculture 12(2): 16-26.

Bentley, P. Van Mele, and G. Musimami, J. (2021). The Mud on Their Legs Farmer-to-Farmer Videos in Uganda, Michigan State University, East Lansing, MI, USA.

World Bank (2018). Expanding Opportunities and Building Competencies for Young People: A New Agenda for Secondary Education. The World Bank. Washington, DC. 300pp.

MacGregor, S, (2019)."Sustainability through vicarious learning: reframing consumer education," Social Learning Towards a Sustainable World, vol. 19, Wageningen Academic Publishers, Wageningen, Netherlands.

Troussas, A, Krouska, C. and Virvou, M, (2020). "Using a multi module model for learning analytics to predict learners' cognitive states and provide tailored learning pathways and assessment," Machine Learning Paradigms, Springer, Berlin, Germany.

Annor-Frempong, M. Zinnah, E and Adam, A, (2020). "Teaching of agricultural science at the basic education level in developing countries: a case study of the nature and constraints at Cape Coast district of Ghana," in Proceedings of the 19th Annual Conference, pp. 58–64, Raleigh, NC, USA.

Murray, C. E. (2019). Diffusion of Innovation Theory: A Bridge for the Research-Practice Gap in

Counseling. Journal of Counseling & Development, 87(1), 108-116.

Kathuri, N. J. (2018). "A study of the new agricultural education in the secondary school in Kenya," University of Illinois at Urbana, Champaign, IL, Ph.D. thesis. USA.

United Nation Educational Scientific Cultural Organization (2015), Participation in Formal Technical and Vocational Education and Training (TVET) Worldwide: An Initial Statistical Survey, UNESCO, Paris, France.

Hurst, S. D. R., T. Grady; and Harder, Amy (2020). Beliefs and Attitudes of Secondary Agriculture Teachers About Global Agriculture Issues. Journal of Agricultural Education, 56(1), 188-202.

Kothari, D (2014). Research Methodology: Methods and Techniques, New Age International Publishers, New Delhi, India, 2nd edition. VOL.2

Polit, E.E and Hungler, H.E, (2015). Foundations of mixed methods research: integrating quantitative and qualitative approaches in the social and behavioral sciences. Los Angeles: SAGE. Pp. 212-214. VOl.21.

Juma, A., Njoroge, R., & Wambui, T. (2023). Integration of Modern Agricultural Techniques in Secondary Education. *Journal of Agricultural Education*, 45(2), 145-159.

Kato, P., Mukwaya, S., & Kibalama, N. (2023). Evaluating the Gaps in Practical Agricultural Training in Ugandan Schools. *Uganda Education Review*, 39(1), 22-35

Mukasa, R., & Kaggwa, J. (2021). Challenges in Implementing Practical Agriculture in Ugandan Secondary Schools. *African Journal of Education and Technology*, 27(3), 66-78

Ouma, P., & Okello, L. (2022). Enhancing Agricultural Education through Practical Learning. *East African Education Journal*, 31(2), 135-148

APPENDICES

Appendix 1: Work plan

S/N	Task	Time frame (month/year)	Responsible person
1	Research Concept development and presentation.	May, 2022	Student
2	Dissertation write up and presentation	June-September 2022	Student
3	Submission of the dissertation to REC	June, 2023	Student
4	Review of the dissertation by REC	July 2023	
5	Hiring of research assistants	August, 2023	
6	Field data collection	August-September 2023	Student
7	Data analysis and report writing	September, 2023	Student
8	Presentation of first draft report	October, 2023	Student / Research Assistants
9	Handing in of the Final report	November, 2023	Student
11	Publishing of outcomes	December, 2023	Student

Appendix 11: Research budget

Items to use during research process	Quantity	Unit cost/item (shs)	Total Amount (UGX)
Typing, Printing and photocopying	…	300,000	300,000
Research assistants for data collection	4	100,000	400,000
Transport to the field (too and flow)	Three times	40,000	120,000
Binding	3 copies	20,000	60,000
	……	…….	
Feeding research assistants	4	20,000	80,000
Accommodation for research assistants	4	25000	100,000
Car fuel	15 liters	6,000	82500
Miscellaneous	…..	…	300,000
Total			**1,442,500**

Appendix 111: Questionnaire for respondents

Dear respondent, am **Everest Turyamureba,** a student of Bishop Stuart University, Mbarara, Kakoba main campus pursuing Master of Agriculture and Rural Innovations conducting a research study on the "**the relevancy of Modern Agriculture Education on students' farming practical skills in secondary schools in Kabujogera Town council, Kitagwenda district**". The questionnaire items are about the study and you are kindly requested to participate in responding to the questions below. The information given will be treated as confidential and the results of the study will be used for academic research purposes only.

Section A: Socio-demographic characteristics of respondents

1. Respondent's sex

a) Female ( )

b) Male ( )

2. Age in years……

3. Marital status

a. Single ( ) b. Married ( )

c. Widowed ( ) d. Divorced ( )

4**.** Level of education in years…….

5. How big is your school farm in acres ……

Section B: Different methods of Modern Agriculture taught in secondary schools in Kabujogera Town council, Kitagwenda district

6. Do you have enough modern agricultural equipments to help students gain practical skills?

a) Yes ( ) b) No ( )

7. If, yes list some modern equipments the school has to improve skills among agricultural students?

…….

……..

…….

……....

8. If no, give reasons for your answer?

…….

……..

…….

9. Does your school teach modern agriculture to improve your practical skills?

a) Yes ( ) b) No ( )

10. If, yes, mention the methods of modern agriculture your school use to teach that would help you improve agricultural practical skills?

a. Utilization of modern agricultural inputs ( ) b. use of biotechnology ( )

c. Use of improved farm machines ( ) d. Use of Modern Greenhouses

e. Monoculture ( ) f. Use of modern resistant crop varieties ( )

g. Pre and Post-harvest handling methods ( )

Any other (specify)……

……

11. Through modern methods of agriculture taught, mention the prerequisite practical skills acquired as a student?

a. Skills on farm machine use ( ) b. Pests and disease identification skills ( )

c. Post-harvest technology skills ( ) d. Skills on biotechnology ( )

Any other (specify)……..

…….

Section C: Challenges experienced in modern agriculture education in secondary schools

13. Do you experience some challenges during teaching and learning of modern agriculture in your school?

a) Yes ( ) b) No ( )

14. If yes, mention the challenges experienced?

a) Poor learning environment ( ) b) Limited modern agricultural in puts ( )

c) Poor motivation among students and teachers d) Poor time management ( )

e) Limited modern agricultural resources to use ( ) f) Poor school infrastructure ( )

g) Limited school farm size ( )

Any other (specify)……..

……

……

……

15. If no, (13 above) give reasons for your answer

……

……

Section D: Strategies to enhance modern agriculture education in order to improve practical skills among secondary students

16. Are you given enough time for modern agriculture practical education?

a. Yes ( ) b. No ( )

17. If yes, how often do you do agricultural practical session in a term?

a) Once a week ( ) b) Daily basis ( ) c). monthly basis ( )

any other specify…….

18. If no, 16 above) why?.....

……

19. Could there be some strategies to enhance modern agriculture and practical education in order to improve practical skills among secondary students

a. Yes ( ) b. No ( )

20. If yes, mention the strategies?

a. Extra funding to agriculture department ( )

b. Recruitment of experienced agriculture teachers ( )

c.. Use of practical demonstration method ( )

d. Use of student centered approach ( )

e. Agriculture tours and field trips ( )

f. Any other (specify)…….

……..

……

……

Thank you for your cooperation. God bless you

<u>Ekyipapura kyiriho ebibuzo byokugarukamu ebikwatirine nokukyondoza</u>

Ahari Omuhurikiriza;

Ninye **Turyamureba Everest** omwegi ahitendekyero erikuru erya Bishop Stuart University arikukora okucondooza ahari "ebyakubasa kuruga omukushomesa empingyisa yomurembe kongyera aha bukugu bwabegyi omumashomero ga sekendure omuri Kabujogera tawuni Kanso Kitagwenda disiturikiti. Ebyoragarukemu ninza kubibika nke bihama kandi bikwozesibwe omukushoma kwangye kwonka. Webare munonga.

Ekicweka kyokubanza (A): Ebikwatsire ahamuhurikiriza

1.**Obuhangwa:**

a. Omushaija/Omwojo ( ) b. Omukazi/Omwisiki ( )

2. Emyaka …….

3. **Obyobushwere**

a. Tinkashwerwaga ( ) b. Nshwirwe/Nshwire ( ) c. Nkaferwa omushaija/omukazi ( )

d. Nkataana ( ) e. Ebindi ……

4. Ebyobwegyese (emyaka eyoshomire)…….

5. Omwanya gwishomire ogukuhigwamu nokurisamu nigwinganakyi omubuhango…….

Ekicweka Kyakabiri (B): Emiringo etakushana eyomurembe omubuhingyi noburisa erikushomesibwa omumatendekyero ga sekendure omuri Kabujogera tawuni Kanso Kitagwenda disiturikiti.

6. Mwine obyokuhingisa byomurembe omwishomero ryanyu ebikubasa kuyamba abegyi kufuna obukugu?

a. Yego ( ) b. Ngaha ( )

7. Kandi mwaba mubyine bigambire turebe okubikwija kuyamba abegyi kufuna obukugu?

……..

……..

……

8. Kandi byaba bitariho, hereza enshonga?

……..

……..

……

9. Eishomero ryanyu nirishomesa empingyisa ne byoburisa byomurembe kwongyera ahakuguka kwa abegyi?

a. Yego ( ) b. Ngaha ( )

10. Kurirabe niribishomesa, ngambira empingyisa eyomurembe eyibakushomesa abegyi?

a. Okukozesa embibo yomurembe ( ) b. Okukozesa omurembe mutsya kwita obukoko obukwita ebihingwa ( )

c. Okukozesa ebyoma byomurembe kuhinga ( )

d. Okukozesa ebiju byomuremba ( )

e. Okukozesa ekyihingwa kyimwe omumusiri ( )

f. Okukozesa ebihigwa ebikugumira embera ( )

g. Okukozesa emiringo mitsya waba otakasharwire ninga waba washarwire ( )

g. Ebindi ……

……..

11. Omubyepingisa eyomurembe eyiba kushomise, gamba obukugu obwoyiheremu nkomwegyi?

a. Obukugu omukukozesa ebyoma byokuhingyisa ( )

b. Obukugu omukumanya obukoko nana endwara zikutegnisa ebihingwa na matungo ( )

c. Obukugu omukukozesa emiringo mitsya waba otakasharwire ninga waba washarwire ( )

d. Obukugu omukukozesa omurembe mutsya kwita obukoko obukwita ebihingwa ( )

Ekyicweka kyakashatu (C): Ebizibu ebikushangwa omukushomesa okuhinga nokurisa kwomurembe omumatendekyero aga sekendure omuri Kabujogera tawuni kanso

12. Nimukyira kushanga obuzibu omukushomes nokwega empinga noburisa bwomurembe omwishomero ryanyu?

a. Yego ( ) b. Ngaha ( )

13. Obuzibu kubirabe buriho nibuha?

a. Ahokushomera nokushomeseza tiharungyi ( ) b. Okutagyira embibo zomurembe zokukozesa ( )

c. Okutagaruzamu abegyi Amani ( ) d. Obutakwata bwire ( )

e. Okubura ebyokukozesa byomurembe ( ) f. Eishomero okugyira byokushomesezamu bibi ( )

g. Okugyira eiitaka rikye ryokuhingamu ( )

h) Ebindi bihandike…….

……

14. Korabe nogyira ngu ingaha, gamba enshonga……

……..

Ekyicweka kyakana (D): Okutaho oburyo kutungura enshomesa yempingyisa yomuremeba kwongyera ahabukuga bwabegyi

15. Nimuhebwa obwire bukumara okuteka omunkora empingisa yomurembe?

a. Yego ( ) b. Ngaha ( )

16. Kubarabe nibabaha obwire bukumara nibuba nibwinganakyi buri tamu?

a. Omurundi gumwe omu sabiti ( ) b) Burizoba ( ) c. Buri sabiti ( )

d. Burikwezi ( )

17. Kworabe nagyira ngu ingaha, ahabwenkyi?

……..

18. Hari oburyo obutirweho kutungura enshomesa yempingyisa nendisa youmurembe?

a. Yego ( ) b. Ngaha ( )

19. Kuburabe buruho oburyo obutirweho nibuha?

a. Okwongera esente o omu itagyi ryobungyi noburisa omwishomero ( )

b. Okwakyira abashomesa abakugu omu byomuhingyi noburisa ( )

c. Okukozesa omuring ogwebyokureberaho ( )

d. Okukozesa abegyi abakyenga kushoborora bagyenzi babo ( )

e. Okutayayira amatendekyero gebyo muhingyi noburisa ( )

f. Ebindi nabyo bigamba…… ……

…….

Webare enkwatanisa. Mukama okumpere omugyisha

Appendix 1V: Interview guide for key informants

Dear respondent, am **Everest Turyamureba,** a student of Bishop Stuart University, Mbarara, Kakoba main campus pursuing Master of Agriculture and Rural Innovations conducting a research study on the "**the relevancy of Modern Agriculture Education on students' farming practical skills in secondary schools in Kabujogera Town council, Kitagwenda district**". The interview items are about the study and you are kindly requested to participate in responding to the questions below. The information given will be treated as confidential and the results of the study will be used for academic research purposes only.

1. What is your marital status?
2. What is your level of education?
3. How long have you been working in this school?
4. Do you have enough modern agricultural equipments to help students gain practical skills?
5. . If, yes list some modern equipments the school has to improve skills among agricultural students?
6. Does your school teach modern agriculture to improve your practical skills?
7. If, yes, mention the methods of modern agriculture your school use to teach that would help you improve agricultural practical skills?
8. Mention the prerequisite practical skills acquired as a student?
9. Do you experience some challenges during teaching and learning of modern agriculture in your school?
10. If yes, mention the challenges experienced?
11. Are you given enough time for modern agriculture practical education?
12. If yes, how often do you do agricultural practical session in a term?
13. Could there be some strategies to enhance modern agriculture and practical education in order to improve practical skills among secondary students?
14. If yes, mention the strategies?
15. If no, why?

Thank you for your cooperation. God bless you

Ekyipapura kyiriho ebibuzo byomushomesa nana abakurira eishomero

Ahari Omuhurikiriza;

Ninye **Turyamureba Everest** omwegi ahitendekyero erikuru erya Bishop Stuart University arikukora okucondooza ahari "ebyakubasa kuruga omukushomesa empingyisa yomurembe kongyera aha bukugu bwabegyi omumashomero ga sekendure omuri Kabujogera tawuni Kanso Kitagwenda disiturikiti. Ebyoragarukemu ninza kubibika nke bihama kandi bikwozesibwe omukushoma kwangye kwonka. Webare munonga.

1. Oshwire ninga oshwirwe?
2. Obwegyese bwawe nibuha?
3. Omazire obwire bukwinganakyi orikukora omwishomero eri?
4. Mwine obyokuhingisa byomurembe omwishomero ryanyu ebikubasa kuyamba abegyi kufuna obukugu?
5. Kandi mwaba mubyine bigambire turebe okubikwija kuyamba abegyi kufuna obukugu?
6. Kandi byaba bitariho, hereza enshonga?
7. Eishomero ryanyu nirishomesa empingyisa ne byoburisa byomurembe kwongyera ahakuguka kwa abegyi?
8. Kurirabe niribishomesa, ngambira empingyisa eyomurembe eyibakushomesa abegyi?
9. Omubyepingisa eyomurembe eyiba kushomise, ngamba obukugu obwoyiheremu nkomwegyi?
10. Nimukyira kushanga obuzibu omukushomes nokwega empinga noburisa bwomurembe omwishomero ryanyu?
11. Obuzibu kubirabe buriho nibuha?
12. Korabe nogyira ngu ingaha, gamba enshonga?
13. Nimuhebwa obwire bukumara okuteka omunkora empingisa yomurembe?
14. Kubarabe nibabaha obwire bukumara nibuba nibwinganakyi buri tamu?
15. Kworabe nagyira ngu ingaha, ahabwenkyi?

s