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Influence of Institutional Factors on the Integration of Practical Skills in Teaching and Learning Agriculture in Secondary Schools in Matayos Sub-County, Busia County, Kenya

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ABSTRACT

Agriculture plays an important role in the economy of any nation as it is the background on which most of the activities emanate from. Throughout history, agriculture has had a significant impact on civilization, serving as one of its primary drivers. The purpose of the study was to investigate selected factors influencing the integration of practical skills in the teaching and learning of agriculture in secondary Schools in Matayos Sub-County, Busia County, Kenya. The study was guided by one main objective namely; to determine the influence of institutional-related factors on integration of practical skills in teaching and learning of agriculture in secondary schools. The study was guided by the experiential learning theory as postulated by John Dewey. The study used the descriptive survey design. Data was collected using questionnaire, interview schedules and observation. The target population for the study consisted of 23 principals, 23 agriculture instructors, 1,591 form three and four agriculture students, and one quality assurance officer in secondary schools in Matayos Sub-County, Busia County, Kenya. The study sampled a total of 367 respondents which comprised of 23 principals sampled using saturated sampling, 23 agriculture teachers sampled purposively and 320 students sampled through random and 1 quality assurance and standard officer. Quantitative data was cleaned and analyzed using SPSS version 26 and data presented using tables and charts. Qualitative data was coded and themes identified then presented alongside quantitative data. The study revealed that institutional related factors like availability of resources, administration support and collaboration with other stakeholders influenced integration of practical skills. The study concluded that schools faced various challenges which hampered integration of practical skills in teaching and learning of agriculture in secondary school in Busia Sub-County, Kenya. The study recommends that teachers be provided with regular professional development courses to enhance their teaching methodology. Additionally, adequate resources should be allocated for practical purposes in teaching and learning of agriculture.

Keywords: Agriculture Curriculum, Educational Collaboration, Experiential Learning, Institutional Factors, Practical Skills Integration, Teacher-Related Factors, Teaching Methods

I. INTRODUCTION

Agricultural education has played a major role in ensuring that agriculture as a core activity of humanity continues to flourish and sustainability in matters productivity achieved. Agricultural education dates back in time, but gained momentum in 19th century. Before that, the United States of America (USA) government created a department that was mandated with ensuring that the necessary information is disseminated on agricultural basis in the year 1862. Since then, agricultural education has increased to an extent that schools have transitioned from just teaching and learning of basic agriculture theoretically to a blend of both theoretical and practical (Jean & Christian, 2018).

In response to the need for both technical knowledge and skills, education stakeholders have not only worked hard to see the improvement in class work but showed initiative to enhance the practical skills of the students in secondary level or high schools. However, to achieve the optimum results in agricultural education in schools, a number of factors play a major role. As a result, various nations in the world have achieved different considerable steps in stepping up the aspect of agricultural education in classes and outside class (Jjuuko et al., 2021).

Globally, scholars agree that practical approach is an important aspect in the teaching of agriculture. Practical approach prepares students for real life experience outside the domain of pen and paper. However, some challenges are said to cause a negative interplay between practical approaches the curriculum dictates. For instance, lack of facilities and high cost of practical and training have an effect on the frequency and quality of practical classes (Maina, 2020). Additionally, poor management, maintenance and upkeep of facilities and budget deficient do not allow the students to learn practical skill development (Maharaj-Sharma & Sharma, 2017).

According to Garrouste (2010), the classical model of agricultural education was first implemented in schools throughout Europe. The North European prevocational education paradigm, which incorporated apprenticeship, first

appeared in 1896. It was the North American model in 1910, focusing on vocational education and requiring student demonstration plots in homes and schools. There were classrooms and a group of young and senior farmers in the Future Farms of America (FFA) class. The East European model, which provided pre-vocational training including polytechnics, was in use between 1930 and 1950. State Farm was included on the model from 1960 to now.

Ingram et al. (2018) notes that in USA, agricultural education is from the high school level up to the university level. Students who come from high schools and want to progress to the tertiary level with agricultural education find it easy to continue with agricultural classes thanks to the theoretical and practical background they are given. In fact, USA has been known to advance the science of agriculture and related technology. To ensure that the students are versatile with agricultural knowledge, agricultural education in high schools in USA are anchored on three critical approaches: class room conceptualization of agriculture, exposure to agricultural experience through supervisory practicums and involvement in Future Farmers of America, a national organization dealing with youth farmers. By doing so, students are not only equipped in class work but tested intensely on various classroom concepts in class practically to see how the knowledge gained can be converted in useful experience.

Another country that has ensured proper adoption of agricultural education is China. As a country that has developed most from agricultural experiences, China has attempted to strike a balance with the changing needs of their market economy. Lai et al. (2020) assert that the main challenge in their agricultural system emanates from their rich agricultural background which they want to preserve at the same time exploring the new agricultural advancements within agricultural domain. As a result, China chose to front agricultural education in endeavoring economic reforms. Research indicate that it is upon realizing the importance of agricultural education, an agricultural movement pegged on economic changes was stated through developing a curriculum that was worth meeting the traditional and modern blend of agricultural education. For advancement purposes, various educational stakeholders have worked hard to ensure that they advance the practical agriculture to prepare students leave school as full-fledged farmers (Lai et al., 2020).

In the region, secondary agricultural education in Africa has been criticized for being a bit conservative and out of step with contemporary student demands and trends. As a result, it is unable to completely address community needs through the use of agriculture (Blackburn et al., 2017). One of the main challenges facing agricultural education in the region is centered on acquisition of information rather than acquisition of practical skills applicable to agricultural development. Even though it has been established that farming in secondary schools gives a lot of opportunities for students to learn and comprehend different practices and concepts, little remain done in most countries in Africa. It is sad to note that very few high school graduates have pursued agriculture as a profession, a fact that indicates that something is amiss in the education system (Francisca & Samsudin, 2018). Majority of the high school graduates in agriculture tended to do studies in higher educational institutions without mastering their knowledge on practical skills in agriculture to increase food production (Amuriyaga et al., 2018).

Hakkinen et al. (2017) revealed that agricultural education has been implemented in secondary schools in Africa on basis of different models. For instance, agriculture is a compulsory subject in some countries, whereas it is optional in others. In Namibia, agriculture is an economic indicator, the teaching of practical skills in agricultural science education contributes a great role to the country's development (Fu et al., 2018). Through agricultural education, the practice of farming continues to evolve from traditional farming for food to commercial farming even in African countries though at a very slow pace (Ighakpe, 2018).

The developments in agriculture and the failure in the application of practical skills in teaching of agriculture education in the 21st century presents a challenge which countries in Africa ought to beat (Fu et al., 2018). Hulela and Miller (2003) notes that in Botswana, agricultural education is compulsory for students at junior secondary schools. However, the teaching of agricultural education is theoretical and not practical oriented. Agriculture is supported in schools through provision of adequate resources thus making the teaching and learning a success. In Botswana agricultural education is optional and optional at senior secondary level and there is little implementation of practical skills in the teaching and learning. In Lesotho, it is optional at all levels and taught theoretically rather than practically. Therefore, the students lack practical skills at the end of secondary school level.

Uganda as a nation has tried to cope up with the realities of empowering students in agricultural background to meet the challenges of food insecurity. As a result, it has put in place various programs to support agriculture education in secondary schools. For example, the Agriculture in Education program provides grants to secondary schools to establish and manage school gardens and livestock projects, while the Youth Entrepreneurship Scheme provides funding and support to young people engaged in agriculture and other economic activities (Okiror et al., 2017).

In Kenya, agriculture remains to be one of countries main source of employment as its versatility in terms of job market remain wide. Economically, it is estimated that 80% of the Kenyan population depends on agriculture. Therefore, a strong foundation in agricultural education in schools would imply a step up in agricultural productivity and vice versa. However, rigidness in implementation of proper practical teaching and learning approach in Kenya has led to mismatch between what the academic prospects are and the real situation in secondary schools (Nyasimi &

Kosgey, 2017). Secondary school level agriculture has not been fully embraced due to lack of facilities and skilled workforce which contribute negatively to skill overall development (Konyango & Odero, 2015).

Teaching of practical agriculture in Kenyan universities usually involves both classroom and field-based learning. Classroom-based learning focuses on theoretical concepts related to agriculture, while field-based learning involves practical application of these concepts on farms, in laboratories, and in various agricultural settings. Additionally, many universities in Kenya have established agricultural research centers, which offer students opportunities to participate in research projects related to agriculture. These centers also offer training and consultancy services to farmers and other stakeholders in the agricultural sector (Maina, 2020). The Kenyan government has also put in place various policies and programs aimed at promoting the teaching and learning of practical agriculture in universities. Such policies and programs include funding for research, development of agricultural curricula, and provision of scholarships and loans to students pursuing agricultural courses (Ndirangu & Udoto, 2011).

It is worth noting that schools should step up teaching of agriculture in secondary schools. They should not only impact knowledge on production but also address the acquisition of practical skills that would help mentor youth who are self-reliant and resourceful to the country. In reality, integration of practical skills in the teaching and learning of agriculture in secondary schools will enable the government meet its agenda of employment and food just as USA and China have. Matayos in Busia County should not be left behind. The agriculture curriculum has topics which require well equipped agriculture workshops, school farm and machines that should be available in most schools (Osakwe *et al*, 2017). Despite the fact that this is the case, it is worth noting that some factors have to be put in consideration in order to capture the full capacity of practical agriculture education in secondary schools. This study will establish how practical agriculture is handled in Matayos in Busi County.

1.1 Statement of the Problem

Despite the critical role of practical skills in agricultural education for economic development, many secondary schools in Matayos Sub-County, Busia County, Kenya, face significant challenges in effectively integrating these skills into their curricula. Agriculture is vital to Kenya's economy, employing 80% of the population (Nyasimi & Kosgey, 2017), yet schools in Matayos struggle with insufficient resources, poor teaching methodologies, and inadequate institutional support. These challenges create a gap between the theoretical knowledge taught in classrooms and the practical skills needed for agricultural productivity. This disconnect affects students' ability to apply agricultural concepts in real-world settings, limiting their potential to contribute to the sector.

Contextually, while Kenya's agricultural sector is central to national development, schools in Matayos lack the necessary infrastructure, including agricultural workshops, farm equipment, and ICT resources. These limitations hinder the hands-on learning experience required for effective agricultural education. Additionally, the region's high poverty rates and underfunded educational institutions exacerbate the problem, creating an environment where practical agriculture education cannot thrive. This gap between policy goals and local realities is a significant challenge in rural educational settings.

Empirically, while previous studies (e.g., Muchiri & Kiriungi, 2015) emphasize the importance of resources and administrative support, there is a lack of focused research on how teacher training, collaboration with agricultural institutions, and community engagement influence the integration of practical skills in Matayos schools. Moreover, existing literature on experiential learning, though recognized as crucial in agricultural education (Dewey, 1938), has not been sufficiently explored in the Kenyan context, especially at the sub-county level. This theoretical gap suggests that more localized studies are needed to understand how experiential learning frameworks can be adapted to meet the unique challenges faced by schools in the region.

Addressing these gaps is vital for improving agricultural education in Matayos, ensuring students acquire the practical skills necessary for agricultural advancement and the broader economic growth of Kenya.

1.2 Research Objectives

To assess the impact of institutional-related factors, including resource availability, administrative support, and collaboration with stakeholders, on integrating practical skills in agricultural education

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Experiential Learning Theory

John Dewey came up with the idea of experiential learning in 1938. It asserts that real learning depends on experiences. Students are encouraged to take an active role in their education, experiential learning emphasizes the application of classroom knowledge, and it establishes connections between previously learned and gained information. Students must possess the capacity for independent thought and the willingness to experiment with practical skills-based

learning. The National Council for Agricultural Education in the year 2020 asserts that agricultural education and experiential learning have been inextricably linked for decades. Agriculture education programs place significant emphasis on the learning by doing theory (Maharaj-Sharma & Sharma, 2017). Conversely, this enables learners to apply theoretical principles acquired in the classroom to practical, real-life scenarios (Aholi et al., 2018). For experimental learning activities to strengthen the connection between cognitive learning and life skills, they must be meticulously planned.

Dewey (1938) posits that human beings develop their own understanding and knowledge of the universe by adopting a learning-oriented perspective. Agriculture students might be granted access to such opportunities by virtue of the hands-on training they acquire. The instructor will furnish students with explanations, examples, and comparisons subsequent to the illustrative agriculture practical, with the intention of aiding them in the formulation of their own analyses of the experiences. The importance of practical experience as a learning tool is emphasized in this study, given that the operational nature of agriculture requires proficient communication of concepts (Herman and Pinard, 2015).

Laboratory-based instruction and student-centered instruction are the two components of learning activities. Since educational activities revolve around the students, teacher-centered instruction does not make a substantial contribution to student learning. By engaging in activities such as conducting experiments (in class) and discussing the results with their classmates, students can enhance their comprehension (Aholi et al., 2018). The frequency, nature, and quality of practical exercises have an impact on how well students grasp novel concepts. By engaging in these laboratory exercises, pupils are afforded the chance to gain an understanding of the methodologies and abilities that enable cognitive transformations that culminate in improved academic achievement (Herman & Pinard, 2015). This theory serves as a valuable framework for directing research that involves the incorporation of practical skills into agricultural education and instruction. It is recommended that instructors incorporate practicals into their courses in order to facilitate student engagement and the acquisition of practical skills and knowledge, which ultimately leads to enhanced academic performance. The student selects and then applies the appropriate practical skills during study, in accordance with this theory.

2.2 Empirical review

2.2.1 Institutional Factors Influencing the Integration of Practical Agriculture

Kabugi (2013) investigated agricultural instruction and learning in secondary schools in Machakos County. Students' attitudes toward learning agriculture were influenced by the type of punishments they received, such as tending flowers, according to the study's findings. Inadequate resources, including school farms, agricultural apparatus, and agricultural classrooms, were also revealed by the survey. This report advises schools to utilize resources to enhance the development of students' practical abilities, which will assist them in achieving the Sustainable Development Goals.

Muchiri and Kiriungi (2015) investigated institutional factors influencing agriculture education in public secondary institutions in Tharaka Nithi County. The primary data were collected via questionnaires and supplemented with secondary data. The research found that sufficient teaching and learning resources create a conducive work environment that improves student performance and enables interaction between various practical learning processes and students. In accordance with vision 2030, the study recommends providing adequate resources to schools in order to improve agricultural performance.

Jega and Julius (2018) conducted a study on the perspectives of secondary school administrators, teachers, and students in Kisii County regarding the implementation of agricultural initiatives. Simple random sampling was used to acquire primary data via questionnaires. The study found that the perceptions of school principals, instructors, and students are the primary drivers of agricultural project implementation. Agriculture is crucial to the education of the populace, and it inculcates values, attitudes, and knowledge, according to the study. Agriculture practicals should be required in all institutions, as these skills will improve food security.

Herman and Pinard (2015) conducted a study in China on the influence of attitude factors on the use of practical skills in secondary school agriculture instruction and learning. The study employed a cross-sectional survey methodology to acquire data from 180 respondents out of a total sample size of 350, using questionnaires and interview schedules. The study found that attitudes affect agricultural education, which in turn affects the application of practical skills. The study suggested that it is essential to comprehend the attitude factors because they determine the application of practical skills in agricultural education.

Francisca & Samsudin (2018) conducted a study on the factors influencing career choice and its effect on performance. The study surveyed 250 individuals, employed a descriptive research methodology, and gathered data via questionnaires and an interview guide. The research found that intrinsic, extrinsic, or both factors affect career choice. The findings also revealed that secondary school characteristics that influence agriculture subject selection include the history of agriculture in the school, the availability of agriculture teaching resources, the school's location and type, and the students' and teachers' perspectives on the subject.

III. METHODOLOGY

3.1 Research Design

According to Kothari (2004), a research design is a conceptual framework that research is built upon and serves as a guide for the collecting and evaluation of data. This study utilized a descriptive survey research design. It allowed the researcher to profile the sample and compile all the necessary data. According to Mugenda and Mugenda (2019), a descriptive design seeks to learn about existing phenomena by investigating people's perceptions, attitudes, behaviors, and values. Descriptive survey was preferred because it is a reliable method when dealing with the large population sample and it involves the use of specialized tools such as questionnaires to collect valuable data (Mugenda & Mugenda (2019). Basing on these arguments, descriptive survey design was appropriate because the area was large. In addition, there was need to collect comprehensive data from the extensive area of study.

3.2 Location of the Study

The research location was Matayos - Busia County. It has a population of 142,408 people and an area of 196.2 square kilometers (2009 census). Latitude 0° and 0° North and Longitude 34° 25 East define the boundaries of the Sub-county. The county is bordered to the east by Kakamega, the south-west by Siaya, and the north by Bungoma. The county borders the Republic of Uganda to the west and a portion of Lake Victoria to the south-east (see map of Busia County in Appendix X11). Teso South, Teso North, Funyula, Matayos, Nambale, Budalangi, and Butula are the seven constituencies in the county. The Kenya National Bureau of Statistics KNBS (2016) estimated that the county's population was 953,337, consisting of 456,356 men and 496,98 women While sugarcane and cassava are the main crops grown for commercial purposes in Busia County, subsistence farming of cassava is practiced widely there (Mutegi et al., 2017). Residents include people of the Somali ethnic group as well as the Luhyas, Luos, Tesos, and Kikuyus. The Sub- County is perfect for farming because it gets a reasonable amount of rain throughout the year and has rather fertile soils. The people' primary economic pursuits are small-scale farming sugarcane farming retail and wholesale trade, transportation, real estate, and buying and selling of cereals.

Other socioeconomic activities in the sub-county include the production of mats from Papyrus reeds in a cottage industry, fishing, making bricks. According to the Sub- County Education Office, there are 21 public and 2 private secondary schools registered in the Matayos, for a total of 23 secondary schools. The county of Busia has an urbanization rate of 16.4% and a literacy rate of 56.7%. The percentage of children aged 15 to 18 who attend school is 78.1% . 66.7 percent of the Sub-County's total population lives in poverty, according to USAID's findings. The transition from elementary to secondary school is average. The performance in primary school is above average, but the performance of secondary schools in the National Examination is low, and there are big differences in how well students do in the area of agriculture. This is a cause for concern.

The location was chosen as the study place because of a number of things. The county was chosen because the Kenya National Bureau of Statistics (KNBS) (2016) found that it is one of the counties with relatively good weather, has few people living there, and has a unique mix between rural and urban areas (Mutegi et al., 2017). The study of this county's rural and urban areas means that the results can be applied to other counties in Kenya. This is because the rural and urban areas of this county are similar to those in other parts of the country. The above-mentioned county is also a good choice because it is close by and has many different economic and social perspectives (see Appendix X11).

Second, the location was chosen based on what interested the experts. Kothari (2004) said that a researcher's choice of location can be affected by things like how well they know the place because they live there. Since the researcher lived in the county chosen for the study, Busia County was already known to her. It was smart for the researcher to find a place where collecting data could be done quickly and easily, which is what happened. Cooper and Schindler (2014) additionally stated that it's easier to get data if you do study in a place where people know you as a friend or coworker. With the help of a study assistant, the researcher was able to collect data by calling and meeting with people over and over again.

3.3 Study Population

A population under study is all the people, places, and things that the researcher is interested in studying because they share some observable attribute (Cooper & Schindler, 2014). Consequently, the target population is the population that the researcher intends to investigate. This investigation targeted the principals, teachers, and students of secondary schools in the Busia sub-county. The study specifically targeted 23 principals, 23 agriculture instructors, 1,591 form three and four agriculture students, and one quality assurance officer. The selection of these population units was influenced by their awareness of the factors that affect the incorporation of practical skills into the teaching and learning of agriculture. These organizations are responsible for formulating, designing, and implementing the incorporation of practical skills into agricultural education.

3.4 Sampling and Sample Size

The purpose of this section is to describe the sample size of the study's respondents and the sampling methodology.

3.4.1 Sampling

Sampling is the method used by the researcher to choose the people who will take part in the study (Kothari, 2004). Sampling methods define how researchers select samples of people to participate in studies. Saunders et al. (2019) asserted that sampling methods can be categorized as either probability or non-probability. Unlike non-probability sampling, which relies on the researcher's judgment, probability sampling gives all parts of the study an equal chance of being selected. This study used both stratified and simple random sampling, which are both types of probability sampling. Mugenda and Mugenda (2019) states that probability sampling was chosen because it gives each part of the population an equal chance of being chosen. This makes it easy to draw conclusions about the whole population.

The study used a method called "stratified random sampling" to choose respondents from different groups. The divisions were made up of three types of schools: private, extra-county, and sub-county. This helped the researcher choose which respondents to include in the study. After stratification, the study used a simple random sampling method to choose participants from each group. The researcher used stratified random sampling because it lowers bias and makes sure that all groups in the study are represented well. Cooper and Schindler (2014) claimed that the method was chosen because it was less expensive than a poll and made the process of gathering data faster. These was appropriate to select students respondents to minimize bias and because the researcher was not aware of students ability in agriculture. Purposive sampling is a type of non-probability sampling in which the researcher chooses the people who will take part in the study based on his or her own opinion The study therefore employed purposive sampling to select teachers of agriculture who are the resource people in the subject area of study. Saturated sampling was used on the principals of the schools under the study as they are the facilitators and Censes for Quality Assurance and Standards Officer (QUASO) who are involved in monit0ring of the curriculum.

3.4.2 Sample Size

According to Mugenda and Mugenda (2019), a sample size is the total number of people randomly selected from the population under research According to Kothari (2004), the percentage of respondents who opted to be notified of the responses to the study questions, the confidence interval (margin of error), and the level of confidence all play a role in the sample size calculation. It is permissible to use a confidence interval of 1% to 5% when calculating the sample size for extrapolation (Kothari, 2004). The confidence level of 95% used to estimate the sample size is considered sufficient in the social sciences. The sample size was calculated using+ /the Yamane (1967) method because the population of interest was already known. Since the Yamane formula is the most precise scientific formula available, it was used to determine the appropriate size of the sample. The study's usage of Yamane's (1967) formula is shown below.

$$n = \frac{N}{1 + N(e)^2}$$

Where, **n** is the sample size e is the probability of error (within the desired precision of 0.05 for 95% confidence level and **N** is the target population. Given a population of 1, 591 students, the sample size was calculated as follows.

$$n = \frac{1,591}{1 + 1,591(0.05)^2} = \mathbf{319.64 \sim 320}$$

The students' target population of 1, 591 resulted to a sample size of approximately 320. The target population of 1,591 thus generated a sample size of approximately 320.The sample size for each stratum was calculated using a fraction nf/N. Since nf=320and N=1,591, the sampling fraction f=nf/N. At this level n- is the sample size, at confidence level with -+5% precision, desired sample (nfc)-denotes the desired sample size of each category while the population size Nc-denotes the number of staff in each category. Table 3.1 shows the distribution of the sample size across the 23 sub county schools.

Table 1
Sample Size Distribution

Target populations	Target Population	Sample Size	% from target population	Sampling technique
Students	1, 591	320	20	Simple random
Teachers	23	23	100	Purposive sampling
Principals	23	23	100	Saturated sampling
Quality Assurance and Standard Officer	1	1	100	Census sampling
Total	**1, 637**	**366**		

3.5 Data Types, Data Collection Procedure and Data Collection Instruments

This section describes the data classifications, data collection process, and data collection tools.

3.5.1 Data Collection Instruments

This investigation utilized both primary and secondary sources to collect information, allowing for the accumulation of both qualitative and quantitative details. The researcher used questionaires, interview schedules and observation checklists

Questionaires

A questionnaire is a data collection instrument set out in formal way designed to enlist information from the respondents (Kothari, 2004). The questionnaires were of two types Teacher questionnaire and Student questionnaires which comprised structured questions and unstructured questions The researcher distributed questionnaires with both open-ended and closed-ended questions to both students and teachers. According to Cooper and Schindler (2014), open-ended questions were used in addition to closed-ended questions because they enable respondents to express their thoughts and make suggestions without being limited to questions the researcher has already formulated. Due to their clarity and absence of room for interpretation, closed-ended questions were preferred due to the limited time allotted for the snapshot research

Interview Schedules

Principals and the officer in charge of quality assurance and standards were interrogated in semi-structured meetings lasting between 40 and 60 minutes. Principals were interviewed because it was believed they had the most knowledge of the practical integration process.

Observation

Observation was also used by the researcher to determine the institutions were operationally functional. They assisted in evaluating the school's facilities. The researcher observed the farm, classrooms, school laboratory, poultry and cattle pens, school museum, and farm-based educational initiatives. Thus, the researcher was able to collect unfiltered, primary data. This assists in determining agricultural education resources are available and utilized.

3.6. Data Collection Procedure

The researcher's data collecting procedure will include both the channels used to collect data and the data itself. Permission to conduct research was obtained by the MMUST Directorate of Graduate Studies (see Appendix Xi) and NACOSTI (see Appendix VII).

A research assistant for the Kakamega County sub-county was engaged and educated to help with data collection. The time it took respondents to finish the survey ranged from two weeks to a month. The participants' busy schedules necessitated that the work be done between 1:00 and 2:00 and 4:00 and 5:00, respectively. It took two months to gather all the information needed for the exercise. The research assistant received phone calls as a reminder that he needed to finish data collection by a certain time. Weekly meetings with the research assistant were planned to review the research's progress and address any problems that arose during data gathering. The final step in the data analysis procedure was to check each questionnaire for accuracy and completeness before editing, coding, and entering the results into SPSS. The data from SPSS was then cleaned, converted, and examined.

3.7 Validity of the Study Instruments

Kothari (2004) states that validity is how well the results of the analysis of the data explain the thing being studied, how accurate and important the conclusions made from the data are, or how reliable the tool used to collect the data is. There were three main types of tool validity: face validity, construct validity, and content validity. To make sure that all of the study variables were covered, the researcher made sure that the surveys and interview schedules were

face-valid by basing them on the conceptual framework in figure 2.1. In the first part of the questionnaire, respondents were asked about their demographics. In the second part, questions got into the theories behind the study variables. In the third part of the questionnaire, an interview schedule was included to get opinions about the study variables. This was done to make sure that the questions on the tools were about the people who were being studied.

Kyule et al., (2018) asserts that a test of construct validity shows how well a set of theories or ideas can be tested. By looking at the results of earlier studies, the researcher was able to figure out the construct validity of the instruments. The literature review gave the researcher a lot of information that was used to come up with research questions and a plan for interviews that would help get information about the factors that affect how agriculture is taught and how practical skills are taught.

Mugenda and Mugenda (2019) defines "content validity" as "the degree to which the data collection instrument produces the statistical results that might be expected from the study." The contribution of the supervisor and application of a content validity index enabled us to achieve this objective. Regarding the content validity of the study instruments, the researcher sought assistance from faculty members and supervisors in the Curriculum and Instructional and Technology department at Masinde Muliro University of Science and Technology. Based on their suggestions, the questionnaires and interview schedule were revised to improve their utility, clarity, and wording. When calculating the CVI, the researcher also considered the supervisors' opinions regarding the study equipment.

3.7.1 Reliability of the Instruments

Reliability can be defined as the capacity of a test to produce identical results when administered to the same individuals over and over again (Kothari, 2004). The researcher administered 37 questionnaires in the Mumias East sub-County as part of a pilot study. After piloting the questionnaire, Cronbach's Alpha was calculated using SPSS version 20 software for the research variables. Across the board, Cronbach's alpha was 0.791, with all research variables scoring above 0.7 on the scale. According to the findings of the study, the questionnaires were appropriate for data collection because they had an internal consistency of at least 0.70. According to Table 2, the findings substantiate the claim made by Saunders et al. (2019) that Cronbach alpha coefficient scales of 0.7 and above indicate adequate internal consistency.

Table 2

Reliability Test Results

Cronbach's Alpha	**Coefficient**
1.Curriculum guidelines	0.75
2.Teacher Related Factors	0.82
3.Institutional Related Factors	0.78
Total	**0.791**

Since the calculated value exceeds the prescribed value of 0.70 for the Cronbach's alpha coefficient. Based on the results, it appears that descriptive analysis is appropriate for the research variables used in the study. All of the study's individual variables were likewise trustworthy, with Cronbach's alpha coefficients exceeding the threshold of 0.7 considered statistically significant for reliability.

3.8 Data Analysis and Presentation Techniques

After the data collection was complete, each questionnaire was given a unique identifier to prevent data duplication and streamline the coding process. The information was then coded, entered into an Excel spreadsheet, and cleaned up to remove any inconsistencies or missing numbers. After the data was cleaned, it was sent to SPSS version 20 for analysis. The researchers decided to use SPSS version 20 since it has robust tools for data translation, manipulation and variable comparison. Descriptive and inferential analysis were performed on the collected data.

3.8.1 Descriptive Statistical Analysis

Descriptive statistics were employed to organize the data and make it easier to spot trends and draw conclusions from the study's findings. The study relied on measures of central tendency (frequency, percentage, mean, and standard deviation) to accomplish its aims. Descriptive statistics were utilized to organize the information included in the study's tables and figures. The data gathered from the interviews was examined by categorizing the responses into themes that reflected the goals of the research. These responses corroborated the study's questionnaire findings, providing support for those results.

IV. FINDINGS & DISCUSSION

4.1 Influence of School Related Factors on Integration of Practical Skills in Teaching and learning of Agriculture in Secondary Schools

The objective of the study was to determine the influence of institutional factors on integration of practical skills in teaching and learning of agriculture in secondary schools. Institutions play a foundational role in ensuring that the integration of practical skills is well achieved for student benefit.

4.1.1 Availability of Teaching and Learning Materials aligned to Integration of Practical Skills

The study first sought to determine availability of resources that are associated with the practical lessons within the institutions in context. To achieve this, the study asked the respondents to indicate the availability of the various teaching/learning resources and the results are presented in the table below.

Table 3

Teachers Respondents on Availability of Teaching and Learning Resources

Facility/Resource	Yes		No	
	Frequency	%	Frequency	%
Demonstration plots	20	100	0	0
Agriculture Workshop	4	20	16	80
Livestock and Livestock tools	6	30	30	70
Farm structures	6	30	14	70
Farm Tools and equipment	20	100	0	0
Farm inputs	20	100	0	0
Models	4	20	16	80
ICT resources	4	20	16	80
Total				

Findings in the table above indicate that the schools had demonstration plots, farm tools and equipment and farm inputs since all the 20 teachers (100%) indicated that the school had the said resources at their disposal. However, the reason why most schools have these resources is because they are required to have them by the ministry of education for the students have to do a practical exam. However, some other resources were found to be unavailable in some schools including agriculture workshop, livestock and livestock tools, models and ICT resources. For instance, only 4(20%) of the respondents indicated that they had agriculture workshop, models, and ICT resources while the remaining 16(80%) indicated that their schools had no such resources at their disposal in their school.

Principals were also asked to share their perspective on the aspect of the resources that were required by the students and teachers for practical lessons. Just as the teachers confirmed, all the 18 principals confirmed availability of resources like demonstration plots, farm inputs and farm tools and equipment. Similarly, just as the teachers had indicated, all the 18 (100%) principals opined that their schools had challenges with other resources like ICT resources, livestock and livestock tools and equipment and models. For instance, one of the principals said:

> *The issue of field trip is among the issues that give the administration headache given the scarcity of funds in the school. The current situation in education requires a lot of resources for effective teaching and learning process. As a school, we have a budget which has to fit at least every area that requires input but more emphasis are put on the resources that the school cannot do without. The reality on the ground is that it is not easy to have everything that is required for agriculture practical, in fact, as a school we find it very difficult to acquire some resources like livestock and related resources and ICT materials that would aid in teaching and learning process. This is because we are underfunded by the government which on the other hand has given a lot of directives on practical lessons.*

4.1.2 Administration Support for Agriculture Practical Lessons

The study sought to establish the level of support that teachers and students are given for the purposes of teaching and learning of practical agriculture within the schools in context. Administration is one of the pillars that are mandated with ensuring student and teachers' wellbeing in every aspect. The study therefore asked the teachers to rate the level of support that the administration has put in for practical lessons and the findings are presented in the figure below.

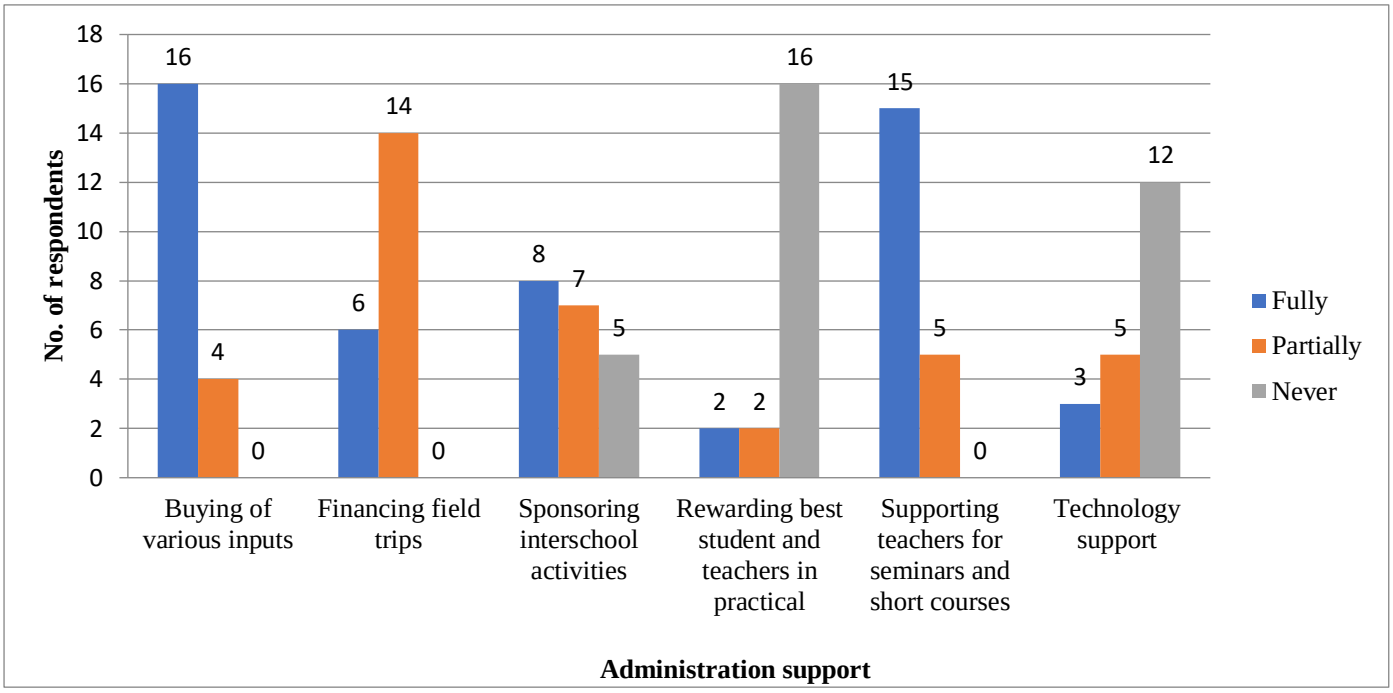

Figure 1

Administration Support for Teachers and Students

From the figure above, varying responses from teachers on administrations support can be seen. Concerning administration supporting the teachers on buying of firm input, 16(80%) of the teachers indicated that the school administration fully supports them on this endeavor while the remaining 4(20%) indicated that the school partially supported them. This is in line with the findings that were obtained on the aspect of availability of farm inputs where respondents indicated that they were available. Basing on this, it is worth noting that the school tried its level best to ensure that such support of inputs came through to help the students have their practical lessons. Additionally, some input as Karani et al (2021) puts were a must for the use by the candidates whom it was a must they undertake a practical project. Teachers' comments on this indicate that some of the inputs that were bought by the school include fertilizer, seeds, pesticides and other tools like machetes, weeding hoe, spades and wheelbarrows just but to mention a few.

Another issue that the study inquired about concerning administrative support was on the school financed trips. Just as indicated in the figure above, 6(30%) of the respondents indicated that they were fully supported by the administration concerning the field trips while remaining 14(70%) respondents indicated that the school partially sponsored the field trips. Most of the teachers who commented on the issue pointed out the fact that students were to have more trips than the once per year trip, implying that they field trip issue was not fully serviced by the administration. In addition to this some indicated that they needed more time with the students in the field given that they travel long distance and are required to go back before they even finish the objectives of the field trip. This implies that at a point, the administration considers field trips partially to justify why the school fees includes field trip allocation that are paid along.

Principals were asked to give their opinion on the field trips are done as required and according to the guidelines given by agriculture curriculum and one of the principals opined:

> *The curriculum does not give any directive on how many trips the students should have. One issue about trips is that it is not only agriculture that requires trips, some subjects too require that trips be incorporated in the process of learning. In this regard therefore, the administration has to make wise decisions on how to sponsor this trips, given that they are expensive to facilitate and students are many across the four classes in secondary school. However, the school makes sure that at least it has sponsored a trip once a year for every class so that the students can get a chance to have a taste of learning outside class or school environment. In my opinion, such field trips are just a way to help students cement what they have learnt in class.*

The study also sought to establish how the school supported interschool activities through agricultural clubs. Only 8(40%) of the respondents indicated that this was fully supported by the school administration while 7(35%) respondents indicated that the school administration partially supported this. Furthermore, 5(25%) of the respondents indicated that the school administration never supported interschool agricultural activities through agricultural clubs. This implies that very few students in Busia County had a chance to interact with students from other schools to share

the practical projects that they might have at their disposal. The reality is that such interschool activities happen to be a point where teacher and students tend to share various agriculture practical concepts that would otherwise have not known.

One of the critical factors in teaching and learning especially through involving way like practical lessons is rewarding the best performers in the farm. In regards to this, the study wanted to find out how school administration supported the teachers and students by recognizing the efforts of the best projects and rewarding them. Contrary to the researchers' expectations, the findings indicate that teachers and students who stood out in practical activities were never appreciated with 16(80%) of the respondents indicating so. However, 2 (10%) respondents indicated that their school had a reward program for outstanding teachers and students in practical activities while the remaining 2(10%) indicating that their school partially supported them through reward initiative. Commenting on the reason why the school may not be in position to do so, some of the teachers' suggestion pointed towards the fact that most of the projects that are done in the schools are done for exam purposes and has little benefit to the school. Abalu (2011) postulates that rewarding students who do well in agricultural projects is a way that can help motivate students to dream of achieving much and encourage others to join choose agricultural science.

Another aspect that the study wanted to find out how administration supported agriculture teachers on the issue of attending seminars and other teacher development programs. Today, the reality is that there are very many innovations in the field of agriculture that require teachers to update themselves to remain relevant. However, most of the workshops and seminars require input from the school administration since the teachers attend such seminars to represent the school. Concerning this issue, 15(75%) of the respondents indicated that the school administration supported them fully to attend seminars and teacher development programs which acted as refreshment courses to the knowledge that they already had in agriculture. The remaining 5(25%) of the respondents indicated that their school partially supported this. Commenting on this, one of the respondents indicated that sometimes they would be invited for a seminar but the school fails to step in due to financial difficulties.

Principals were also required to give their view concerning the same. What came out clearly from them is that they did not what their teachers to remain behind since it would derail the school and affect the performance as some of the seminars are organized by education stakeholders. Speaking on the subject in context, one of the principals said:

> *Yes, we support our teachers to attend seminars and other teacher development programs since we understand as the administration that education is dynamic and require one to refresh to catch up with the current issues in his or her field of professionalism. Therefore, as administrators we normally encourage out teachers to attend the seminar and teacher development programs and give them both material and financials support for the same. Additionally, like in my case, I advise my teacher to take advantage of holiday or ask for study leave to go and pursue short courses that would help him or her improve in her profession.*

A principal asserted,

> *"For us to encourage integration of practical skills in teaching agriculture, we have established a link with Agricultural Training Centre within the county for practical and demonstration purposes during weekends. The school of late has held several meetings with parents so as to come up with mechanism of getting more funds to buy land, tools and equipment to be used for agriculture practical purposes".*

Another principal quipped thus;

> *"We encourage the schools to have a joint academic tour with other schools to reduce on cost so as students can learn practical lessons in agriculture better. Teachers are also encouraged to be creative in delivering practical lessons in agriculture. The formation of young farmer's club by students is also a priority towards integrating of practical skills in teaching and learning agriculture subject".*

Resources play a very vital role in ensuring that students get enough hands-on experience in their practical lessons. Research indicates that schools that have invested in agricultural resources have not only permed well but produced learners who have shone in agricultural related areas post-secondary education. Furthermore, schools that have demonstrated competence in agricultural science projects are said to be considerate of the fact that students should have access to various resources for them to portray their true image in science. What has been evident in some cases is that those students who have had difficulty in theory and exams have sometimes proved so effective in practical areas provided that resources required are at their disposal.

The above findings imply that study findings imply that schools lack adequate resources to be used by students to learn agriculture practical in their respective schools. The study findings correspond with Kyule et al., (2018) who found out that resources' availability has a positive and significant effect on performance and Abalu (2011) who observed that resources had a positive effect on integration of practical skills. Francisca, & Samsudin, (2018) concluded that resources had a negative and significant effect on the integration of practical skills, while the current study disagrees.

Although school success is influenced by other external factors, including the head teacher, the results of this study agree with those of Okiror et al. (2017), who found that an effective head teacher is the key element for an effective school.

Principals' levels of motivation are the single most important predictors of their success. This is due to the fact that a principal's position as a leader entail mobilizing school resources and setting the institution's strategic goals and objectives. In the schools that were evaluated, principals did not play a significant role in making decisions.

Previous studies indicate that the role of the school administration in agriculture practical in secondary schools in Kenya is to provide leadership and management for the agricultural education program, which includes overseeing the curriculum, instruction, and assessment. The principal also works to ensure that the program aligns with the school's mission and goals, as well as with local, state and national standards (Aholi et al., 2018; Kyule et al., 2018) Additionally, the principal is responsible for ensuring that the program is adequately resourced, including staffing, materials and facilities, and that the program is meeting the needs of students and the community. The principal also works to build partnerships with local organizations and agencies to support the program and to provide opportunities for students to gain real-world experience in agriculture (Karani et al., 2021).

4.1.3 Collaboration with Other Major Players in Agriculture Sector

The study sought to find out the how schools' collaboration with other players in agricultural sector influenced integration of practical skills in teaching and learning of agriculture in secondary schools. Respondents picked on a level of 1 to 3 where 1=Agree, 2=Neutral and 3-Disagree. Results are presented in the table below.

Table 4

Collaboration with Other Major Players in Agriculture Sector

Statement	**1**	**2**	**3**
Collaboration enhances curriculum development	18	2	0
Improves teacher training	15	2	3
Expands access to various resources necessary for practical teaching and learning	20	0	0
Provides opportunity for networking and mentorship	17	2	1
Increases funding and support	20	0	0
Statement	1	2	3
Collaboration enhances curriculum development	18	2	0
Improves teacher training	15	2	3
Expands access to various resources necessary for practical teaching and learning	20	0	0
Provides opportunity for networking and mentorship	17	2	1
Increases funding and support	20	0	0

Findings in the table above indicate that most of the respondents 90% (18) agreed to the fact that institutional collaboration with other players enhances curriculum development. However, 10% (2) of the respondents indicated that they were neutral on the same implying that they were not sure on the collaboration had any effect on curriculum development. Additionally, 75%(15) of the respondents indicated that institutional collaboration with other players improves teacher training while 10% (2) were neutral and 3 disagreed. Interestingly, 100% (20) of the respondents indicated that collaboration with other agricultural players like institutions and communities expanded access to resources which are necessary for integration of practical skills in teaching and learning. The case was similarly on the view that institutional collaboration with other players increases funding and support from major players in agricultural sector like the government and non-government organizations. The findings also indicate that 85% (17) of the respondents indicated that collaboration provided opportunity for the students to form networks outside schools and be mentored in agricultural related activities.

The above findings are in agreement with previous studies conducted by Kyule et al., (2018) which established that: Collaboration between schools, government agencies, and other organizations can help to enhance curriculum development, improve teacher training, expand access to resources, provide opportunities for mentoring and networking, and increase funding and support. Furthermore, collaboration can help to ensure that the curriculum is relevant and up-to-date, incorporating real-world experiences, developing specialized programs, and improving assessment and evaluation.

During the interview schedule with the quality assurance and standards officer, one of the issues that came out is their role in helping the schools develop a working synergy with other agricultural players in the region as the narration below put.

> *If the schools have to work in isolation, then they will trail behind in helping the students understand various aspects of practical agriculture, that is why we advices and encourage the administration to work*

towards creating a working synergy with other institutions within the region which have tools and equipment that the students can learn from.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusion

In Kenya, the secondary school syllabus for agriculture includes topics such as crop and animal production, soil science, agricultural mechanization, and agricultural economics. The curriculum also includes practical components, such as field trips and hands-on projects, to give students hands-on experience with the concepts they are learning. Moreover, Finally, school collaboration with other actors can play a key role in providing students with a well-rounded education in agriculture that includes both theoretical and practical skills. By working with local farmers, agricultural organizations, government agencies, and other educational institutions, teachers can gain access to a wide range of resources and opportunities that can help to make the teaching and learning of agriculture more engaging, relevant, and effective.

5.2 Recommendations

Adequate resources such as land, equipment, and materials are essential for the integration of practical skills in agriculture education. Schools in Busia Sub-County should have access to land for practical learning and farmers should be encouraged to donate equipment and materials for use in the classroom. Collaboration between schools, farmers, and the local community and the government. Government should provide adequate support to schools in terms of funding and technical assistance for the integration of practical skills in agriculture education.

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