



# Determinants of students learning competencies in agriculture through hands-on experiences

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## ARTICLE INFO

## ABSTRACT

### KEY WORDS

Teaching

Learning

Methodology

Practical

competency hands-on-experiences

The overall goal of this study was to assess the implementation of curricula for agricultural courses aimed at equipping students with the requisite emerging competencies that should make them self-reliant after training. Most technical and vocational colleges lack infrastructure such as agricultural laboratories, agricultural tools, equipment and farms for teaching the courses. In Kenya, there is currently no data indicating whether or not students study agricultural courses due to personal interest and conviction or because it was the only option available. The study sought to establish: ways in which teaching methodologies used by teachers' impact the practical competencies gained by learners through hands on experiences, and find out the perceptions of learners towards pursuing further studies and activities in agricultural disciplines. The study observed 89% of those who had two practical lessons in a term indicated that they can practice agriculture on their own. It is concluded that, most teachers engage resource persons in their teaching. Majority of the teachers do not also embark on field trips with their students to places where students can have a real experience of certain concepts or materials that cannot be made available in their school environment for studies. More studies should be carried to explore ways of infusing value based learning by employing modern online techniques that enhance learners' competencies in their careers.

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<https://doi.org/10.58506/ajstss.v1i2.9>

## Background information

Agriculture is defined as an art and science, including the keeping of animals to provide wool, hide, skin, food among others products and tilling of the soil for the growing of crops and for man's use (Karim and Karim, 2017). Agriculture nature is broad and dynamic so to define it becomes ambiguous. In the twenty-first century, a few developed countries have met the world's population demand for food using modern innovation and technology in agriculture. Several improved modern technologies and scientific researchers have led to increase food production despite many training challenges (Hemathilake et al., 2021).

Competency is the capability to do something efficiently or successfully. A skill is a gift acquired through learning a psychomotor act in the process of observing competence. The ability to perform an observable behavior through hands-on experience that brings results or products that can be seen is competence (Dell'Aquila et al., 2022). To perform a skill well one needs related knowledge that makes acquiring the new knowledge possible. Competencies can be explained as the process of acquisition and application of knowledge, skills and abilities (Toshtemirova, 2022).

One significant part of a technical and vocational college education is hands-on practical activities work. The teacher, during lessons, tries to make knowledge of the natural world and develop students understanding of theories, ideas and models that are found by scientists to be useful in explaining and predicting behavior (Haili, 2022). The teaching of agricultural courses in technical and vocational colleges needs to be both theoretical and hands-on practice for a better appreciation of the courses (Sultana, 2022).

The curriculums for agricultural courses aim at equipping students with the requisite knowledge and skills that should make them self-reliant after training (Okoli, 2022). Most technical and vocational colleges lack infrastructures such as agricultural laboratories, agricultural tools and equipment, and demonstration farms for teaching the courses. In Kenya, there is currently no data indicating whether or not students study agricultural courses due to personal interest and conviction or because it was the only option available.

The three domains of learning; affective, psychomotor and cognitive, are known to agricultural educators. Due to the difficult nature of measuring the other two domains in content, instructional and assessment are usually centered on the cognitive domain (Cassar, 2022).

There have been arguments among policymakers, educators, and other stakeholders concerning deter-

minants of competencies through hands-on experience. It is, however, generally accepted that the determinants of competencies through hands-on experience vary with context such as environmental conditions, culture, institution and course of study (Gamage et al., 2022).

Students perceive studying agricultural courses as beneficial courses to them, their families, their institutions, and their entire nation and even worldwide. Nevertheless, most of the students need to be given a piece of advice and persuaded to take an interest in the study of agricultural courses (Cosb et al., 2022). To make students appreciate the importance of agricultural courses is to support them to change their perception of the agricultural courses ((Cosb et al., 2022) and incorporate more hands-on practical activities during training them.

## Problem Statement

In many Agricultural courses students have never kept farm records, planted crops, dewormed an animal, touched a bird, applied fertilizer, sprayed chemicals or managed a farm (Oviawe et al., 2017)). It would have been anticipated that demonstration of acquired skills and knowledge be involved in the final examination of agricultural courses students, however, the final examination covers mainly the theoretical aspects and alternatives to hands-on practical. In these recent times, students are able to read courses materials textbooks, teachers' notes and pass both internal and external examinations in agricultural courses with good grades with ease without sighting growing plants on a farm (Oviawe et al., 2017).

The Kenya National Examination Council (KNEC) fails to assess practical competencies or skills at craft certificate and diploma level that are gained through institution demonstration farms for practices but the Technical and Vocational Education Training Curriculum Development Accreditation and Certification Council (TVETCDACC) does the assessment but it is still at the mushrooming stage. This has led to a decrease in the use of technical and vocational colleges' demonstration farms for developing a skill. The lack of clubs like young farmers' clubs and organizations in technical and vocational colleges has also led to a decline in agricultural attitudes and skills development. In recent times many students pass internal and external examinations in agricultural courses without farm demonstration practices to boost their technical knowledge and practical orientation but learning through theory (Antwi, 2017).

According to Robinson et al., (2018), most technical and vocational college teachers see hands-on practical work as an essential characteristic of their everyday

work. Many of these teachers believe that hands-on practical work leads to better learning. It is usually easier to understand and remember things that are done than things that are just told. Students like hands-on practical work more than other kinds of lesson activities. However, from experience, students do not learn from hands-on practical work the things that are to be learned.

It is also noticed that, after a few weeks of carrying out hands-on practical work, most can only remember specific surface details of the work but many are not able to remember what has been learned from it or what they were doing it for (Robinson et al., 2018).

In another instance, from my own observation as a teacher, many students are usually not able to undertake hands-on practical activities well when left alone afterward to carry out what was studied in the lecture halls. Students usually show fewer capabilities in carrying out the hands-on practical lessons taught. In the light of the above, it is important to find out the determinants that influence hands-on practical competencies among technical and vocational college agricultural courses students.

#### *General objective*

The objective of this research was to identify the determinants that influence competencies through hands-on experience of technical and vocational colleges' students in agricultural courses in Meru National Polytechnic (MNP).

#### *Specific objectives*

- i. Establish ways in which teaching methodologies used by teachers' impact the practical competencies gained by learners through hands on experiences,
- ii. To find out the perceptions of learners towards pursuing further studies and activities in agricultural disciplines

## **Literature Review**

### *Introduction*

All over the world Universities and other relevant institutions respond by revising courses, curricula and programmes to enable students to acquire the skills needed in hands-on competencies to become professionally successful (Neuhouse et al., 2022). Students would always want to have up-to-date knowledge that is in line with the standards of the industry and is therefore challenging administrators and faculties to deliver appropriate courses, curricula and programmes to meet the changing trends (Neuhouse et al., 2022).

In measuring how effective a technical and vocational college curriculum is, one measure that is often used is how well students perform. There are several ways of determining the effectiveness of a teacher one of them is by assessing the skills and knowledge of students. Academic results reflect what was learned by students and the objectives achieved during the programme (Cassar, 2022). The objectives set should be laid down and followed to be able to properly use student tests as a way of evaluating the effectiveness of a programme. The set objectives should be based on the competencies and skills of experts already in the field and industry considered as important for employment (Cassar, 2022). According to Chapman, (2017), Agriculture courses teachers focus more on content and content delivery that is teacher-centered than problem-solving due to the fact that students no more have real-life problems to make good use of lecture hall instruction (Chapman,2017). To make Agricultural course programmes sustainable, the programmes should be relevant, based on agriculture and with more emphasis on the study of hands-on Agriculture courses for the future (Hoover and MacDonald, 2017).

### *A glimpse of Kenya Agricultural Education*

Kenya is now a middle-level income country while her peers at the time of independence have now made giant strides in their economies using Agriculture as the backbone for their development (Enns and Bersaglio, 2020). At independence Kenya's educational system sort to achieve three goals including; producing a scientifically literate population, tackling the environmental causes of low productivity and producing knowledge to harness Kenya's economic potential (Enns and Bersaglio, 2020).

The national economy of Kenya in the aspect of food production, income generation and employment opportunities recognizes agriculture as a very important component of the economy. The ministry of education in achieving government policies of the full potential of agriculture has the responsibility of reviewing agricultural education to make Kenya an agro industrialized country (Amwata & Boga, 2020).

### *Importance of Kenya Agricultural Education*

The recent world economic knowledge and skills in various educational disciplines, innovation and technology continue to be a competitive advantage to many countries but knowledge and technology can be utilized to improve productivity and improve the well-being of citizens through high-quality human capital (Malik, 2019). For Kenya to be in competition with

other countries, the knowledge base, techniques of production and skills of the workforce must go beyond the attitudes, abilities and acquired inherited skills (Malik, 2019). Formal education is very important in acquiring skills, attitudes and knowledge. Education is a major factor in the adoption and /or modification of modern technology. In agriculture, for modern farming techniques to be adopted and effectively implemented, farmers must know how to read instructions and use of the new inputs (Malik, 2019).

#### *Challenges facing Agricultural Education Teachers*

Agriculture teachers need a conducive working environment to be able to teach effectively. However, the lack of equipped workshops, tools, types of equipment and institute demonstration farms in most tertiary institutions in the Imenti North district makes the teaching of agricultural courses ineffective. Most teachers that have much workload tend to have negative effects on their teaching hands-on agriculture, (Chibelitu, 2017).

There are several serious problems in the way of institutions and teachers toward hands-on practical work, even though there is good evidence to show that the problems are usually misunderstood and exaggerated to the disadvantage of students learning. One striking factor that hinders the quality and variety of practice is the teachers' lack of time and national assessment framework (Barnes et al., 2018). Another constraint of hands-on practical activities is the lack of both preservice and in-service train planning, carrying out, and evaluating particular practical lessons that would provide learning skills and opportunities to students ((Barnes et al., 2018).

#### *Technical and Vocational Colleges Teaching Methods of Agriculture Courses*

As in many other courses areas of teaching and learning, sharing knowledge and skills with students in Agricultural courses may be done through several methods that are lectures, discussions, demonstrations and electronic methods such as videotaped instructions. Diise et al., (2018), show that the mindset of a person that is centered on the surrounding field has a field-dependent learning style while the one who separates items from the surrounding field is moving closer to a field-dependent learning style.

#### *Technical and Vocational College's Students' Perception of Agriculture*

A study among technical and vocational college students in Kenya shows that a negative perception of students in agriculture courses is partly due to the lack of essential materials like, agricultural laborato-

ries, demonstration farms, working tools and agricultural courses textbooks (Antwi, 2017). On the other hand, proper use of land for agriculture activities by most, demonstration farms and commercial purposes make students viewing agriculture as a less difficult subject, to be positive perceptions of students towards agriculture as a subject (Antwi, 2017). Another positive perception of agriculture is the fact that students in the study agreed that the suggested hands-on practical work in the agricultural courses syllabi for technical and vocational colleges in Kenya is adequate (Antwi, 2017).

#### *Personnel for Teaching Agricultural Courses in Technical and Vocational College*

According to Schonert-Reichl (2017), creating a welcoming environment for students to learn is the sole responsibility of the teachers. Students have confirmed that their increased knowledge, attitude and skills in agriculture courses are a result of their teachers' good and effective performance in the lecture halls (Schonert-Reichl, 2017). Students perceived many of the teachers in agricultural courses programmes to be successfully teaching agricultural courses in the lecture halls and also being responsible for their enrolments in the tertiary level agricultural education programme (Prayitno et al., 2017).

#### *Benefits of Agricultural Courses to Technical and Vocational College*

Teachers believed that integrating agricultural courses into their curricula has great benefits for their students, because, in a way, it provides connection and authenticity in the teaching content to their students. The implication of this is that there is an interrelationship between nature and human needs and agricultural courses provide a foundation for discussion (Sutton & Anderson, 2020). Technical and vocational colleges farming activities by agricultural courses students practices is providing food for the institution and surplus is sold to act as incoming generating for the institutions (Christensen et al., 2019).

#### *Effects of Motivation on Agricultural Courses Teaching and Learning*

According to Sargani et al., (2020), students' attitudes towards entrepreneurship can have a good entrepreneurial motivation effect. Students should therefore have a positive mind towards entrepreneurial activities so as to help them start agribusiness. Again, students who are seen as family and friends models of entrepreneurs, stand the chance of starting

an agricultural business in the future. Students involved in entrepreneurship education, are also seen to have a great positive impact in encouraging students to go into agriculture entrepreneurships, (Sargani et al., 2020).

### **Research Methodology**

This study was carried out at the MNP. The study employed the survey design because the design's role is to describe issues in their real situation Guidotti et al., (2018). The perceptions and opinions of 100 agricultural courses students and 6 teachers from MNP were collected.

### *Sampling Frame*

Many students after completing their courses do not have hands-on experience. MNP being a center of excellence in building and construction in East Africa there was the need to carry out a study on determinants of agricultural students learning competencies through hands-on experience to know how they are unique from the rest of the institutions.

### *Targeted Population*

The research targeted students in tertiary institutions pursuing agricultural courses programmes and agricultural courses teachers in Meru National Polytechnic (MNP).

### *Sampling Techniques and Sample Size*

Out of the nine hundred students in the MNP pursuing agricultural courses programmes, stratified, purposive sampling and simple random sampling were used to select one hundred students. Purposive sampling was used to select students in the agriculture department pursuing one of the courses viz. Craft Certificate in Agriculture (CRA) and Diploma in Agriculture (DAG). Three agricultural courses teachers training each of the sampled courses were purposively sampled, making a total of 6 sampled teachers for the study. The sample size of the students was determined following Fields' rule (Guest et al., 2017). A total sample of 106 respondents was used for the research. The sample gives a fair representation of agricultural courses students and teachers in the MNP.

### *Research Instruments*

Two different sets of closed ended questionnaires were administered to facilitators teaching agricultural courses and students enrolled and learning agricul-

ture at MNP. The non-structured interviews were conducted.

### *Data Collection Procedures*

The questionnaire was administered to teachers and students. Unstructured interviews were conducted to teachers and students. The data filled was verified and cleaned.

### *Data Analysis*

Primary data was collected then edited and cleaned by reading through responses to make corrections and reshaping some of the responses to make them more meaningful. The questions in the questionnaire were then coded under simple titles for easy response entry. The responses will then be entered into the coded headings by summarizing some of the responses given by the respondents for analysis. The data analysis was done by using Statistical Package for Service Solution (SPSS). The analyzed data was then be presented in the form of tables, pie charts and percentages where applicable.

## **Data analysis, Presentation, Results and Discussions**

### *Response Rate*

The study targeted 106 respondents, 105 respondents, filled-in and returned the questionnaires making a response rate 99%. According to Mugenda and Mugenda (2003) 50% response is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent; therefore, this response rate is excellent for analysis, discussion and conclusion.

### *Agriculture Department Bio-data of Respondents*

The response rate was 99% (99 responses) and 100% (6 responses) students and teachers respectively.

### *Agricultural Courses Distribution of Student Respondents by Sex*

The eighty-three students (83%) were males and seventeen students (17%) were females. From the data more males do study Agricultural courses in the MNP. The study deduced that less females' students pursue Agricultural Courses programme than their male counterparts in the tertiary institution level. This confirms the finding of Van et al., (2020) that

state majority of females applying to join tertiary institutions in Africa choose other courses.

#### *Agricultural Courses Distribution of Students*

Out of ninety-nine (99) student responses, forty-one (41) students (41.4%) were pursuing a Craft Certificate in General Agriculture (CRA) and Diploma in Agriculture (DAG) students were made up of fifty-eight (58) students (58.6%).

#### *Agricultural Courses Teachers (Staff) by Sex*

83% of the teachers were males while 17% were females. Consequently, most Agricultural courses teachers are males. As noted by Chibelitu (2017) most females do not select agricultural courses from high school to university level. This could be as a result of the saying that agricultural course is difficult and females are afraid of it.

#### *Agricultural Courses Teachers by Qualification*

It can be generally stated that, most (81.3%) of those who teach Agricultural courses in MNP are professional teachers. This is in line with Al-Zahrani et al., (2018) findings that, most Agricultural Courses teachers have the necessary qualification. Makovec (2018) stated that teaching experience in relation to the number of years taught and teacher qualification are factors that are connected to students' success with hand-on experience.

#### *Agricultural Courses Field Trips*

It was recorded that the majority of the teachers generally do not go on field trips with their students. Just about 16 % of the professional teachers embark on field trips with their students at least once in a term for academic studies. This goes contrary to the statement of Johnson (2017) who asserted that, of the different methods of teaching, lectures and educational tours were the methods that influence the choice of agricultural courses in the technical and vocational colleges. It could also be due to administrative challenges of funds to organize such trips. This can be related to findings of Kaviti (2018) that, many principals do not receive funds live ministry of education capitation from government on time leading to no or few practical lessons as practical skills depend on the materials available.

#### *Frequency of Performing Practical Lessons*

The findings were that one (1) professional agricultural courses teachers have practical sessions with their students while one (1) non-professional agricultural courses teachers have practical lessons more than once a term with their students. Four professional agricultural courses teachers and one non-professional agricultural courses teacher engaged their students in practical lessons more than once a term and none of the agricultural courses teachers had no practical lesson with the students in a term. Generally, the majority of the agricultural courses teachers agreed that the more practical lessons, the better students can perform on their own. This assertion from the teachers on practical lessons with students agrees with what Mead et al., (2017) stated that the demonstration method of teaching agricultural courses to students leads a better retention than the discussion method.

#### *Practical Lessons per Term*

The more practical lessons in animal production, agricultural engineering and crop production, the higher the number of students who said they can practice Agriculture on their own (Tables 1, 2 and 3).. This implies, the more practical lessons leads to the better the performance of practice (Mangla et al., 2018).

#### *Self-Practicing of Agricultural courses by Students after Tertiary Level*

Eighty-two (82%) indicated that they can practice agricultural course on their own while eighteen (18%) stated that, they cannot practice agriculture on their own (figure 1).

Four agricultural courses teachers Representing Sixty-six Percent (66%) Asserted that Agricultural Courses students after the completion of the tertiary level, would be able to practice agriculture but with a lot more training. Two agricultural courses teachers, representing 34% also disagreed that, Agricultural Course students after completing tertiary can practice agriculture on their own. The agricultural courses teachers' evaluations of their students suggest that, even though the students have high interest in agricultural courses, they need more practical experience to enable them to practice agriculture efficiently. Contrary to Diise et al., (2018), it has been also observed that in recent times many agricultural courses students pass both internal and external examinations in agricultural courses without farm demonstration practices to boost their technical knowledge and hands-on practical orientation by learning through theory only.

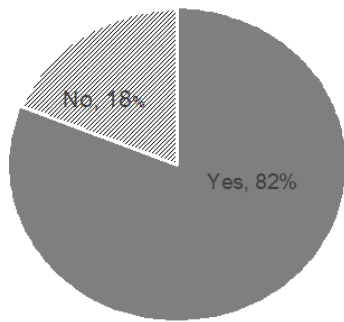


Figure 1: Percentage of students Practicing Agricultural course on their Own

*Student Interest in Agricultural courses as a Profession*

Seventy-six percent (76%) of the students were interested in becoming full-time farmers after tertiary level, while twenty-four percent (24%) had no interest in practicing farming after tertiary level as a full-time job (Table 4).

The high interest in becoming full-time farmers could be linked to the fact that most students are encouraged by their agricultural courses teachers in the courses of their studies to pursue agricultural Courses at a higher level. The majority of the students also indicated that their agricultural courses teachers educated them about their careers and the potential opportunities of Agricultural courses, therefore the high interest in practicing farming after the tertiary level.

*Factors that influence students' perception of Agricultural courses as a Career Choice*

The majority (81%) of agricultural courses teachers observed their students be interested in agricultural Courses. This positive interest perhaps is a contributing factor to the teachers' belief that students have perceptions such as growing food for their families and agriculture as job opportunities. Females are less interested in farming than their male colleagues. This could be linked to the perception that farming is a strenuous work which makes it less suitable for females. It is in line with Ball et al., (2017), who reported that female students have a little less positive attitude than their male counterparts towards science. Alston et al., (2020) reported factors such as interest in agricultural courses, employment avenues in agriculture, high academic ability in agricultural courses and influence by agricultural courses teachers and parents as fac-

Response	Frequency of practical lessons						Total
	None	Once	Twice	Thrice	Four	Five	
Yes	5(71%)	2(66%)	7(89%)	3(75%)	17(100%)	60(100%)	94
No	2(29%)	1(34%)	1(11%)	1(25%)	0(0%)	0(0%)	5
<b>Total</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>17</b>	<b>60</b>	<b>99</b>

Table 1: Practical Lessons per Term in Animal Production in Relation to Practicing Agricultural courses

Response	Frequency of practical lessons						Total
	None	Once	Twice	Thrice	Four	Five	
Yes	6(60%)	12(71%)	8(89%)	14(93%)	19(95%)	28(100%)	87
No	4(40%)	5(29%)	1(21%)	1(7%)	1(5%)	0(0%)	12
<b>Total</b>	<b>10</b>	<b>17</b>	<b>9</b>	<b>15</b>	<b>20</b>	<b>28</b>	<b>99</b>

Table 2: Practical Lessons per Term in Agricultural Engineering in Relation to Practicing Agricultural courses

Response	Frequency of practical lessons						Total
	None	Once	Twice	Thrice	Four	Five	
Yes	8(57%)	7(78%)	8(89%)	8(80%)	6(100%)	52(100%)	89
No	6(43%)	2(22%)	1(11%)	1(20%)	0(0%)	0(0%)	10
<b>Total</b>	<b>14</b>	<b>9</b>	<b>9</b>	<b>5</b>	<b>6</b>	<b>52</b>	<b>99</b>

Table 3: Practical Lessons per Term in Crop Production in Relation to Practicing Agricultural courses

Response	Numbers	Percentage (%)
Yes	75	76
No	24	24
<b>Total</b>	<b>99</b>	<b>100</b>

Table 4: Interests in Full-Time Farming after Tertiary Level

tors that influence female students' choice of Agriculture Courses programme.

The effect of sex is a determinant in choosing farming as an additional occupation. Seventy-nine percent (79%) of the males stated that, they would definitely engage in farming activities in extra to their main occupation in future. Sixteen percent (16%) indicated they may practice farming activities as an extra source of income. Only four males stated that, they are not sure of practicing farming in extra to their main occupation. Another five percent male students stated that, they would practice agriculture in extra to their main occupation.

Sixty-eight percent (68%) of the females indicated they would practice farming activities as an extra source of income, about twenty-seven percent (27%) may practice farming and about seven percent (7%) were not sure of practicing farming as an extra source of income. None of the males indicated that they would not engage in farming as an extra source of income. In all, a total of seventy-three percent (73%) of students are interested in undertaking farming as an extra income source, twenty-one percent (21%) may practice farming as an additional source of income and the remaining more than three percent (3%) not engage in farming as an extra source of income. Less females have less interest in farming as an extra source of income than their male colleagues. This could be due to the traditional division of work where males are engaged more in farming activities than their female counterparts.

#### *Motivational factors to agricultural courses students being interested in practical farming after tertiary level*

Students who go regularly on field trips, eighty-six percent (86%) of students stated that they would take up farming as an extra source of income, and eleven percent (11%) stated they may take up farming activities as an extra source of income. Three percent (3%) indicated that they would not want to engage in farming activities as an extra source of income at all. Seventy-six percent (76%) of students, who go on field trips, stated that they would practice farming as an extra source of income, twenty-five percent (25%) of the students who sometimes go on field trips stated they would practice farming as an extra source of income. Most students who go for a field trip at least once a term (75%) stated that, they would practice farming as an extra source of income, appropriately twenty-four percent (24%) stated they would practice in farming as an extra source of income. The total respondents showed that about seventy-six (76%) of the students would practice farming as an extra source of income, about twenty percent (20%) may

practice farming, and only four percent (4%) are not certain of practicing farming as an additional source of income.

Students who go regularly on field trips are more interested in practicing agriculture than those who do not go on field trips. Joshi et al., (2020) assert that participating in international agricultural forums exposes students to new strategies and technologies for making agriculture useful to them, their families and their communities. Fifolt et al., (2018) also asserted that many students admitted they would recommend supervised agricultural courses experiences programme to their friends as the programme gives hands-on experiences.

#### *Agricultural Courses Teacher Motivation as A Factor to Students Being Interested In Agriculture*

Out of the 105 respondents, 95% of the student respondents indicated that they had received some form of encouragement from their agricultural courses teachers. All students who claimed to have been encouraged to pursue Agriculture, 81% of respondents who had received encouragement from their agricultural courses teachers indicated their willingness to become full-time farmers in the future while on twenty-one students (22%) are not interested in agriculture despite their teachers' encouragement.

From several who responded negatively to the question of whether they received encouragement from teachers or not, 43% indicated disinterest in full-time agriculture later in life, while 57% indicated their interest in full-time agriculture. This indicates that teacher encouragement is a major factor in determining the perceptions of students regarding the pursuit of Agriculture full-time in the future. Ninety-nine students responded to both questions of teacher encouragement and their course of study after tertiary level. Out of the total number of student respondents to these questions, sixty-four students indicated that they are encouraged by their teachers to pursue agriculture at a higher level. 77% of students stated they would become full-time farmers after tertiary level due to their teachers' encouragement.

The remaining nineteen students representing (19%) are interested in other areas of study than agriculture. Nineteen students out of the ninety-nine students indicated that their teachers do not encourage them to pursue agricultural courses at higher institutions. Even though, these nineteen students claim they are not encouraged by their teachers, twelve (64%) are interested in pursuing agriculture at the higher institution. Inegbedion and Islam (2020) assert that agricultural teachers' motivation is a factor



to the student being motivated to pursue agricultural courses and later on become full farmers.

#### *Way forward in teaching and learning of agriculture*

The majority of students in this study believe that teaching and learning of agricultural courses could be enhanced through practicing hands-on experience. Some of the suggested ways by which students further stated the improvement in agricultural courses include the establishment of institution demonstration gardens or farms, agricultural laboratories, more agriculture trained teachers, workshops, more tools and equipment for teaching and learning agriculture, farm machines, motivation such as scholarship packages for agricultural courses students and more practical lessons.

Ryu et al., (2019) reported that if elementary educators are to make agricultural courses information part of the existing curricula, then agricultural educators are to rely on individuals to teach and practice these concepts successfully. Lee et al., (2017) reported that students have confirmed that their increased knowledge in agricultural courses is a result of their teachers' good and effective performance in the lecture halls and hands-on practices in the demonstration farms.

#### *Key Findings*

MNP has two gardens for practical demonstrations of crop production, agricultural engineering and animal production practical lessons

Most of the practical lessons done are appropriate for agricultural courses.

#### **Conclusions**

The majority of students who pursue Agricultural Courses at the tertiary level are males and leading to the majority of the Agricultural Courses teachers being males. Teachers in the tertiary level have the basic qualification for teaching at the tertiary level and the experience or expertise needed to make teaching and learning interesting and meaningful to Agricultural Courses students if they are provided with the necessary materials. It can also be concluded that most teachers engage resource persons in their teaching. The majority of the teachers do not also go on field trips with their students to places where students can have a real experience of certain concepts or materials that cannot be made available in their institution environment for studies.

Students who had more practical lessons with their teachers can practice Agriculture on their own as

compared to their counterparts who had fewer practical lessons in MNP. Most students are more interested in pursuing Agricultural Courses at the higher levels and also interested in practicing agriculture after the tertiary level.

#### **Key recommendations**

Agricultural resource centers should be setup in national polytechnics like Meru National Polytechnic to serve as avenues for practical lessons and practice.

More studies should be carried to explore ways of infusing value-based learning by employing modern online techniques that enhance learners' competencies in their careers.

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