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**UNIVERSITY FOR DEVELOPMENT STUDIES, TAMALE**

**ASSESSMENT OF THE PEDAGOGICAL COMPETENCY NEEDS OF  
AGRICULTURAL SCIENCE TEACHERS IN SENIOR HIGH SCHOOLS IN  
TAMALE METROPOLIS IN NORTHERN REGION**

**DAUDA ABUKARI**



**2018**

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TAMALE METROPOLIS IN NORTHERN REGION

BY

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(UDS/MEA/0017/14)

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REQUIREMENT FOR THE AWARD OF MASTERS OF PHILOSOPHY DEGREE IN  
AGRICULTURE EDUCATION

UNIVERSITY FOR DEVELOPMENT STUDIES



JULY 2018

**DECLARATION**

**Student**

I hereby declare that the thesis is the result of my own original work and that no part of it has been presented for another degree in this University or elsewhere.

Student's Signature ..... Date .....

Name: DAUDA ABUKARI

**Supervisor**

I hereby declare that the preparation and presentation of this thesis was supervised in accordance with the guidelines on supervision of thesis laid down by the University for Development Studies.

Supervisor's Signature ..... Date .....

Name: Dr. RAYMOND ABUDU KASEI



## ABSTRACT

The purpose of this descriptive study was to assess pedagogical competency needs of agriculture teachers in Senior High Schools in Tamale aimed at determining their perceived level of importance, ability, and most suited training needs based on Borich's Needs Assessment Model. To keep Senior High School agriculture teachers up-to-date of their pedagogical competency needs, the professional development needs of the agriculture teachers must be assessed regularly for efficiency. Based on the model, likert-type scale questionnaires were developed and administered to the sixty- six Senior High School agricultural teachers. The competencies were analyzed in eight constructs. Mean and standard deviation were estimated to indicate teachers' perceived level of importance and perceived level of ability for each of the selected pedagogical competencies, whereas mean weighted discrepancy scores were calculated to represent pedagogical training needs. Teachers considered all of the pedagogical competencies needed for teaching agriculture important. Teachers also considered themselves competent in each of the competencies. According to the agricultural teachers in this study, the most important training needs was associated with nineteen competencies out of fifty selected competencies. The teachers reported that their most preferred training method is further studies. It is recommended that the Public Senior High Schools in Tamale should provide in-service training for their Agriculture Science teachers in competencies such as using materials and technology to make subject matter accessible, effective use of instructional time, keep pace with technological advancement in agriculture, teaching using experiments, among others.



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## **DEDICATION**

This thesis is dedicated to my wife Ruhiya, kids; Nadrat and Najeeda and late mother Sumani Mariama. May Almighty Allah grants her soul paradise.



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## LIST OF ACRONYMS

N.G.O	Non-Governmental Organization
MWDS	Mean Weighted Discrepancy Score
UDS	University for Development Studies
PC	Pedagogical Competence
PD	Professional Development
NA	Needs Assessment
MAP	Move Assessment Profile
STIN	Science Teacher Inventory of Needs
SHS	Senior High School
BNAM	Borich Needs Assessment Model
SPSS	Statistical Package for Service Solution
ICT	Information and Communication Technology
AEAS	Agriculture Extension Agents
ANOVA	Analysis of Variance
INI	Improvement Need Index
STIN-LP	Limpopo Province Science Teacher Inventory of Needs
JKUAT	JomoKenyetta University of Agriculture and Technology
GSS	Ghana Statistical Service
GIS	Geographic Information System
MOE	Ministry of Education
CRDD	Curriculum Research Development Division



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## CHAPTER ONE

### INTRODUCTION

#### 1.0 Overview

This introductory chapter contains the following subsections: Background to the study, problem statement, research objectives, research question, significance of the study, delimitation and limitation of the study.

#### 1.1 Background to the Study

Pre-service teacher training is offered in colleges of education and in some universities in Ghana. Teachers are trained in content and methodology. However, as Widen (1987) clearly stated “even the best of pre-service teacher training cannot equip one for a lifelong career as a teacher”. There is need for continuous professional development and on the job training for professional and personal growth of the teachers. The continuous training and staff development is necessary to prepare the practicing teachers with the necessary skills, knowledge and attitudes to perform their duties effectively. Agricultural science is one of the subjects taught to students in Senior High Schools. Agricultural science is the application of scientific principles to the growing of crops and rearing of animals for human use. Agricultural science is a blend of some of the basic pure and applied sciences. According to Curriculum Research and Development Division (2010), the rationales of senior high school agricultural science are to:

- ❖ Stimulate and sustain student’s interest in agriculture.
- ❖ Enable students acquire basic knowledge and practical skills in agriculture.
- ❖ Prepare students for further studies in agriculture.
- ❖ Prepare and guide students to recognize job opportunities in agriculture.





- ❖ Recognize agriculture as a business and a viable livelihood option.
- ❖ Develop positive attitudes, interests, habits and good practices in agriculture.

For the achievement of these objectives, it is essential to give due emphasis to the teaching of agricultural science. In the view of Olaitain and Mama (2001) the teacher of agricultural science is a person who is educated and exhibits the character of an educated person in all areas of life. He must maintain high ethical standard as well as self-confident. A teacher of agriculture must complete training for his job and keep abreast of the changes in his work through professional development activities. A teacher of agricultural science need to possess pedagogical competencies required of the teaching profession. These include planning instruction, implementing instruction, evaluating instruction and managing principles and practices in agricultural science. Competencies in the submission of Encarta (2009) is the ability to do something well, measured against a standard, particularly ability acquired through training or experience. International Labour Organization (ILO) report (2003) explained competency to represent the knowledge, capabilities and behaviour which someone exhibits in doing his job. Competency in the perspective of this study is the knowledge, skills and attitudes which the teacher of agriculture needs for effective teaching of agricultural science in senior high schools.

In Tamale metropolis, it has been observed by the researcher that teachers of agricultural science depend mostly on textbooks and lecture method in imparting information to students. At times they dictate extracts from other learning material such as pamphlets. The implication of these practices according to Olaitan and Mama (2001) is that senior high school student graduate from school without acquiring the basic competencies that





will enable them to fix themselves into the world of work of agriculture in order to make a living. Teachers of agricultural science impart information to students of agricultural science undermining facilities to use for skill development and for preparation of students towards gainful employment in agriculture in future. Interaction with some teachers of agricultural science by the researcher on one- on -one bases revealed that teachers themselves do not acquire adequate competencies in agriculture which they are expected to impart to students. As a result of this factor and others such as societal view about agriculture and the curriculum used, students in recent times are reluctant in pursuing the agriculture science programmes at the Senior High School level. In order to effectively teach agricultural science to achieve the pragmatic objectives of the subject matter, teachers require pedagogical competency training in their job. Hotaman (2010) purported that teachers need to acquire pedagogical competencies to be effective. He explained that pedagogical competencies affect the success of teachers in teaching. Tamale is the study area with a population of over six hundred thousand according to the 2016 population and housing census estimates. It is a center of education in the northern sector of Ghana. Tamale, like any other big cities in Ghana has a large number of schools offering agricultural programmes. The city has twelve public Senior High Schools (SHS) offering agricultural science related programmes. While some are offering specific agricultural science programmes, the integrated science which includes agriculture is mandatory for all schools. The purpose of this study therefore, is to assess pedagogical competency needs of agricultural science teachers for effective job performance. Specifically the study sought to identify professional competencies in planning instruction; implementing instruction; evaluating instruction among others. This research work focused on the

teachers' perspective. In short the study assessed the characteristics of agricultural science teachers based on their pedagogical competency needs.

### **1.2 Problem Statement**

The agricultural science programmes, since the inception of Senior High Education concept in Ghana, has gone through a lot of curricula revisions or updates in order to meet the agricultural needs of Ghana. These continuous revisions of the curriculum might have put a lot of stress on agriculture teachers in teaching the course as these revisions are usually associated with new and increased challenges. To overcome this burden and thus improve upon the quality of agriculture education there is the need to strengthen the pedagogical competency needs of agriculture teachers. The literature search revealed that significant work had been done in assessing agriculture teachers pedagogical competency needs in many parts of the world including the United States, Nigeria to mention but a few. However, no known work has been done on the subject in Tamale Metro. Nonetheless, in few isolated cases in Ghana research work has been carried out relating to the topic. It is against this backdrop that this study assessed agriculture science teachers' pedagogical competency needs and determined where training is most needed.

### **1.3 Research Objectives**

The purpose of this study is to determine the pedagogical competency needs of agricultural science teachers in Senior High Schools in Tamale, aimed at examining their perceived importance and perceived ability to teach using the selected pedagogical competencies. The research objectives are to:

1. Describe demographic characteristics of agricultural science teachers in Senior High Schools in Tamale Metropolis.



2. Determine the agricultural science teachers perceived level of importance of pedagogical competencies in teaching agricultural science.
3. Examine the level of pedagogical abilities possess by agricultural science teachers.
4. Analyse the pedagogical competency needs of agricultural teachers.
5. Determine the suitable methods for professional development of agricultural science teachers to acquire pedagogical competencies.

#### **1.4 Research Questions**

1. What are the demographic characteristics of agricultural teachers?
2. Do agricultural science teachers in Senior High Schools perceive pedagogical competency to be important in teaching?
3. Do agricultural science teachers perceive desirable to possess pedagogical competency abilities?
4. What are the pedagogical competency needs of agricultural science teachers?
5. What are the methods through which professional development training should be carried out for teachers to acquire pedagogical competency?

#### **1.5 Significance of the study**

The outcome of this study will be beneficial to many stakeholders, policy makers, and those in the educational sector. In effect the outcome will:

1. Provide information on the pedagogical competency professional development needs of agricultural teachers in Senior High School in Tamale. This information will enable educational managers to provide the needed training to update the teachers' knowledge and skills in pedagogy.



2. Aid policy makers especially in the education sector to formulate pragmatic policies geared towards teachers training and performance improvement.
3. Assist organizations such as NGO's and development partners in education to direct their resources appropriately.
4. Add to existing literature on the subject matter and serve as a reference material for other researchers engaged in similar studies.

### **1.6 Delimitation of the Study**

This study targets agricultural teachers of Senior High Schools in Tamale as the respondents and focuses on the pedagogical competency needs of the agriculture teachers.

### **1.7 Limitation of the Study**

In carrying out this study, the researcher encountered a lot of difficulties which were:

1. Risk: In the process of executing the work, the researcher was faced with life threatening situation associated with the use of motor-bike and other means of transport in moving round the study area for data collection and other information relevance to the study.
2. Administration of questionnaire: The researcher was confronted with difficulties in administering the questionnaire as some of the respondents contacted were reluctant to co-operate while others were giving excuses. In many instances, the researcher had to sit with and guided the respondent to answer the questionnaire appropriately.
3. Time Constraints: Equally important activities competed for time available for the research work. As a teacher, I had to combine research work with classroom



activities which negatively affected the researcher concentration. Due time constraints pilot test could not be carried out and thus help to ascertain reliability co-efficient for the study and this could affect the results of this study in terms of reliability of values obtained.

4. Financial Constraints: The researcher was faced with financial difficulties in purchasing materials and seeking services of individuals and organizations relevant to the smooth running of this research. Due to financial constraints some materials and information relevant to the study could not be sourced because they needed to be paid for.

### **1.9 Organization of the Thesis**

The study comprises five chapters: Chapter One entitled introduction focuses on the background to the study, problem statement, objectives of the study, research questions, significance of the study, delimitations to the study, limitations and the organization of the study.

Chapter two entitled literature review highlights related or existing literature to the study to gain an understanding of the research topic.

Chapter Three captioned methodology provides brief explanations on the research design used, population, sample and sampling technique used, research instrument used, validity and reliability of the instruments, needs assessment model used, assumption of the model, constructs and their associated competencies employed and data analysis plan.

Chapter Four comprises the findings and discussions of the study.

Chapter Five presents the summary, conclusion, recommendations and suggestions of research work.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter reviews literature that is relevant to this study. The review serves as a framework that guides the analysis of the findings. It highlights the conceptual and the theoretical frameworks of the study.

#### 2.1 Review of Concepts

This section of the study reviews the key terminologies of the study topic and presented under the following thematic areas: The meaning of pedagogy, pedagogical competence, profession, teacher, professional development, needs assessment and agriculture in Ghana

##### 2.1.1 Definition of Pedagogy

According to Lovat (2003), pedagogy is defined as “a highly complex blend of theoretical understanding and practical skill”. He opined that a teacher is “a highly developed autonomous professional, with a requisite professional knowledge base and practice skills which could stand alongside the equivalent in medicine, law and engineering”. Pedagogy is essentially a combination of knowledge and skills required for effective teaching. Pedagogy described as either the science or practice of teaching that makes a difference in the intellectual and social development of students.

In the view of Namubiru (2006) pedagogy is philosophical and scientific discipline born between the era of 18th and 20th centuries. Due to its theoretical and practical orientations, the discipline has sustained various interpretations and controversies. That is



to say, it has been defined in diverse ways, including the study of being a teacher or the process of teaching and strategies of instruction (Namubiru, 2006).

Pedagogy refers to the “interactions between teachers, students, the learning environment and the learning tasks” (Murphy, 2008, p. 35). This broad term includes how teachers and students relate together as well as the instructional approaches implemented in the classroom. That is, pedagogy is referred to as the relationship between the teacher and the student. As a result of this relationship of pedagogy to children, some researchers desire the use of andragogy when referring to teaching in higher levels of education. Andragogy is the art and science of helping adults learn.

However, Freire (1975) used the term critical pedagogy instead of andragogy to refer to the method of teaching adults.

According to Shulman (1987) pedagogical content knowledge is therefore the specialized didactic knowledge of the teacher, which illuminates the connection between subject matter and classroom know-how.

Vavrus, Thomas and Bartlett (2011) brings together this two elements (content and pedagogy) under the same umbrella “pedagogical content knowledge” to describe the understanding and skills teachers and teacher educators need to transform the conceptual, factual, with appropriate examples, metaphors, and applications for a particular group of students. This research work intends to adopt the use of pedagogy in line with the views espoused by Lovat (2003), Namubiru (2006) and Murphy (2008).





### 2.1.1.1 Pedagogical approaches

Pedagogical approaches are often placed on a range from teacher-centred to learner-centred pedagogy. Though these two approaches may appear contradictory, they can often complement each other in the realization of educational objectives.

**Teacher-Centered Pedagogy:** Teacher-centered pedagogy positions the teacher at the centre of the learning process and usually relies on methods such as whole-class lecture, rote memorization, and chorus answers. This approach is often criticized (Westbrook *et al.* 2013). However, whole-class teaching can be effective when teachers frequently ask students to explain and elaborate key ideas, rather than merely lecture (O’Sullivan, 2008).

**Learner-Centered Pedagogy:** This pedagogical approach is also called constructivist, student-centered, participatory, or active but largely draws on learning theories suggesting that learners should play an active role in the learning process. Here, Students use prior knowledge and new experiences to create knowledge. The teacher is only expected to facilitate this process. He also creates and structures the conditions for learning. Significant amount of research and advocacy has promoted learner-centered pedagogy in recent years for economic, cognitive, and political reasons. However it has been a challenging task for teachers to shift from teacher-centered pedagogy to learner-centered pedagogy.

**Learning-Centered Pedagogy:** “Learning-centered pedagogy” compared with the above discussed approaches is a new term that acknowledges both learner-centered and teacher-centered pedagogy. The approach can be effective if teachers must consider the local context, as well as the number of students in the class, the physical environment, teaching



and learning materials availability among others (O’Sullivan, 2004). It is suggested that teachers should be flexible in their selection of the approach and that the school environment must be carefully considered in adapting pedagogical approach to learning (Vavrus, 2009).

Effective pedagogy can lead to academic achievement, social and emotional development, acquisition of technical skills, and a general ability to contribute to society (Craig *et al.* 1998) Pedagogical effectiveness often depends on the suitability or appropriateness of the approach for specific school and national contexts.

Pedagogy and the Education System: National examinations, curriculum standards, and other educational system policies influence teacher pedagogy. For example, national exams that primarily test discrete factual knowledge, rather than comprehension or analysis, discourage teachers from using pedagogy that develops higher-order critical thinking skills (Vavrus & Bartlett, 2013). For this reason, if education planners wish to change pedagogical practice, it is not sufficient to simply issue new pedagogical guidelines but they should also have to explore ways to align other policies and practices throughout the system.

Teacher expectations of disadvantaged students: When teachers have a positive attitude towards their students, more socially responsive and attentive, tailor their instruction to particular student needs, and are more successful at drawing on students’ experiences to make lessons meaningful and contextually relevant ( Westbrook *et al.* 2013).

Equally, students from disadvantaged social groups, such as females, minorities, or the disabled often suffer from teacher prejudices, which translate into low expectations of



these students' capacities. Teachers who have low expectations of their students make less of an effort to help them learn with the final result that these students often achieve lower academic performance (Lane *et al.* 2012).

Adapting pedagogy to mixed-level, large, and under-resourced classrooms: What constitutes effective pedagogy is often context-dependent; therefore teachers need to receive specific preparation in how to make contextual adaptations to their teaching approaches through both pre-service and in-service training. In mixed-ability classrooms, teachers need to have a deep understanding of students' different ability levels in order to alter their instruction and activities to meet the needs of each student (Westbrook *et al.* 2013).

This research intends to adopt the learner-centred approach to teaching and learning of agriculture as it may be the panacea if the interest of students in the subjects is to be sustained and boosted. The perceived reduced interest by the students in recent times in the subject could be due to the methods adopted by the teachers in teaching the subject as a whole. Agriculture is a practical subject which requires student led learning process whereas teachers facilitators of the process.

### **2.1.2 Pedagogical Competence**

Education is burden with the responsibility of transmitting to learners a variety of skills and knowledge to enable them meets the demands of their profession. As Miliszewska (2008) disclosed, employers of labor are progressively seeking graduates with a range of knowledge, skills and abilities, together with their degrees. Graduate teachers' barren of these attributes will thus be seen to be incompetent. Several studies have been carried out



on identification and validation of pedagogical competencies needed by agriculture teachers. However, the literature search failed to reveal research work directly related to the professional development needs on Pedagogical Competence (PC) of teachers in Tamale public Senior High Schools. This therefore creates a gap for this study to fill and to add to the existing body of knowledge for future researchers.

According to Beebe (2004), cited in Oden and Kankam (2013), instructional delivery in educational institutions in Ghana involves the teaching and learning process as well as the educational program and courses, the teaching pedagogy, research process, information dissemination and publication, library and information services and also higher education administration and management. All these should therefore constitute aspects in which skills should be possessed by a competent teacher to meet the global trend in educational development.

Pedagogical competencies are the inborn and learned or taught capabilities that can bless a professional teacher with a variety of techniques to effectively convey knowledge to students. It includes visible and invisible character credentials. As a matter of fact, knowledge is supposed to be communicated through a variety of techniques. For any functional profession, it is indispensable to employ both formal and informal bits of knowledge. The teacher should have the ability to communicate before the students and his colleagues. He must be able to socialize with his peers. It requires of him her to be competent enough to possess the values which are considered to be associated with mobility. Above all, his psychological and intellectual development must always be on the move. It is a crystal clear reality that all of these traits are highly beneficial for the students. High level of intellectuality coupled with literary and aesthetic taste makes the



process of learning colorful and inviting. Pedagogical knowledge is not only vital for the teacher but he should also observe the anthropological behaviorist posture. In any activity of learning, the favorable relationship among the stake-holders can never be ignored in any condition. The teacher should be equipped with the theoretical and conceptual command of the respective subject. All of these things should be combined through pragmatic techniques.

Competence is a generic term for the knowledge, skills and attitudes required for adequate functioning in the profession. Teacher competencies include subject knowledge as well as “pedagogical” knowledge and skills which enable teachers to work with individuals and groups, with colleagues and other professionals that are responsible for learners. Values are an important component of competencies: teachers’ values and attitudes in regard to learners and their psychosocial development, as well as values and attitudes related to their own professional development.

Singh (2004) said the term “competence” is frequently used when we talk about any profession or work that expresses one’s quality of being competent, possessing adequate professional skill, knowledge, qualification or capacity.

According to Adodo (2013), competency in teaching refers to the ability of a teacher to exhibit on the job skills and knowledge gained as a result of training. These skills and knowledge prescribed in the training program are apparently calculated by the curriculum planners to relate to be instrumental to achievement of the desired education objectives unfortunately not.



Katane and Selvi (2006) put forward the definition of competency as "a set of knowledge and skills needed to perform an activity". A teacher must have a professional educational competency to conduct the teaching and learning process.

Competence in the view of Olaitan (2003) is the knowledge, skill, attitude and judgment which one is required in order to perform successfully at a specified proficiency program.

Competencies in the submission of Encarta (2009) is the ability to do something well, measured against a standard, especially ability acquired through training or experience.

International Labour Organization (ILO) report (2003) posited competency as the knowledge, capabilities and behaviour which someone exhibits in doing his job and which are factors in achieving the objectives pertinent to the teaching strategies.

In the views of Danner and Pessu, (2013), competence is the ability to combine and apply relevant attributes to particular tasks in particular context. Teacher competency within the limit or scope of this study is distinct as the observable and quantifiable capacities of a professionally trained educator in a school on a standard scale. This means that the teacher displays capacities in relation to different attributes that could be seen as capable of forming the learners. Such abilities could include pedagogical, didactic, communicative, relational, information and communication technology, personal management, professional development, assessment, management and administrative skills. These skills are essential for every teacher.

Spencer (1993) observed that competence is a fundamental trait of a person related to the effectiveness of individual performance on the job or the basic uniqueness of individuals who have a causal relationship with criteria referenced and effective in performance at



the workplace or at certain situations. Competence is always related to the ability of a teacher associated with the level of understanding of learners, learning process and self-actualization.

Pedagogical competence is viewed as the ability to manage the learning of learners which includes an understanding of learners, instructional design and implementation, evaluation of learning outcomes, and the development of learners to realize their potential.

Madhavaram and Laverie (2010) based on the resources used in an educational process explained pedagogical competence as “the ability of an individual to use a coordinated, synergistic combination of tangible resources (e.g. instruction materials such as books, articles, cases and technology such as software and hardware) and intangible resources (e.g. knowledge, skills, experience) to achieve efficiency and/ or effectiveness in pedagogy”.

Dima *et al.* (2007) also explained that Competence is a skill, a personal characteristic demonstrated by various behaviors which contribute to outstanding performance in a job. They further expounded that competency is the quality of being sufficiently or well trained and having the aptitude to perform a job.

Stone (1997) described competencies as the application of knowledge, technical skills, and personal characteristics that are designed around the abilities of individuals and groups need to give effective job performance and use in making human resource decisions.

Shavelson (2010) viewed competency based on the following areas: Competency is a physical or intellectual ability, skill or both. He argued that competency is a performance



or capacity to do as well as to know. He explained that competency is carried out under standardized conditions, judge by some level of performance as "adequate," "sufficient," "proper," "suitable" or "qualified", it can be improved, and needs to be observed in real-life situations. He concluded that competency can refer to a person's general knowledge and abilities used to carry out both specified and unspecified tasks leading to the satisfaction of all stakeholders' current and future desired standards.

Ryegard *et al.* (2010) revealed that in line with global research in terms of the concept pedagogical competence there is a clear incremental move from what was formally known as teaching ability or teaching skill to a more comprehensive meaning of pedagogical competence. According to them, up-to-date or current meaning of pedagogical competence encompasses better organizational responsibility. The teacher's contribution to the development of higher education and responsibility as a pedagogy leader are now being highlighted. They therefore argued that pedagogical competence goes beyond teaching skills, teaching ability and the scholarship of teaching.

Oldsjo (2010) further stresses that the traditional view of pedagogical competence is largely a question of practice "in the classroom" whereby a skillful teacher through knowledge, methods, actions and ability to communicate to mention a few gets teaching situation to function and creates conditions for learning. He however points out that this view is deficient in the sense that it does not include a scientific attitude towards teaching and learning. He points out that the teacher's ability is attributable to mainly in a scientifically based subject competence and the practical teaching skills that he /she has acquired and continued to develop.





Olsson *et al.* (2010) confirm that pedagogical competence is a broader concept than teaching skills. They opine that pedagogical competence presupposes good, broad and deep knowledge of the subject of teaching. A pedagogically proficient teacher shall in different context demonstrate a good ability to use subject knowledge in research – related, practical, pedagogical actions with student learning in focus.

Apelgren and Giertz (2010) define pedagogical competence as “the ability and will to regularly apply the attitude, the knowledge, and the skills that promote the learning of the teacher’s students in the best way”. This shall be in agreement with the goals that apply and within the framework available and presupposes continuous development of the teacher’s own competence and instructional design. They emphasized that attitude; Knowledge, ability and perseverance are important ingredients for the teacher’s pedagogical competence.

In the context of this study, competence is knowledge, skills and attitudes required for success in teaching agriculture at the Senior High Schools in Tamale.

In summary, as a teacher, like any other professional, requires certain knowledge and skills in order to be able to effect the needed change in the intellectual and social life of your learners. It is the combination of these knowledge and skills that make teachers competent and the lack of it is the otherwise of an educator. In short a competent teacher is the one who has the ability to understand his or her learners, instructional processes and above all has the tendency to be on top of his or her carrier. Better still competence is the ability to perform assigned task in such a way that produces enviable outcomes. As a result, this study seeks to establish the pedagogical competence level of an agriculture



teacher and to determine if gaps exist or otherwise. If gaps are found to exist, training in the form of professional development opportunity could be suggested or proposed.

### **2.1.3 A teacher**

In the submission of Obanewa (1994) a teacher is person who has undergone the necessary and recommended training in a teacher preparatory program and is charged with the responsibility of managing the classroom in such a way that yields desirable results.

Olaitain and Mama (2001) further stated that the teacher of agricultural science is educated and as such should exhibit the character of an educated person in all areas of life. He must maintain high ethical standard while enjoying good relationship with colleagues and students as well as having absolute self-confident. A teacher of agriculture must complete his preparation for his job and keep abreast of the changes in his work through professional development activities.

### **2.1.4 Definition of profession**

In the view of Hornby (2006) a profession is a type of job that needs special training or skills especially one that needs a high level of education. According to the writer, professional involves specified skills that relate to a particular job for the recognition of the individual in a profession. A teacher of agricultural science need to possess both technical and pedagogical competencies such as planning instruction, implementing instruction, evaluating instruction and managing principles and practices in agricultural science



### 2.1.5 Professional Development

In educational cycles, the term Professional Development (PD) may be used in reference to wide variety of specialized training, formal education, or advanced professional learning intended to help administrators, teachers, and others improve their professional knowledge, competence, skills and effectiveness.

Saucier, (2010) defined professional development as the continual seeking of learning opportunities available to teachers and it is mostly expected from schools, school districts and other state and national agencies. Saucier found that effective professional development is a vital tool for school success and teacher satisfaction.

Lay field and Dobbins (2002) found that educators are faced with numerous challenges while trying to provide a sufficient learning environment for students that will prepare them for useful lives in today's fast-growing world. Learning for educators in his view does not stop after the degree but is a lifelong endeavor. Numerous researchers have reported that agriculture teachers just like other educators are in continual need of professional development opportunities in order to stay up-to-date and enhance their teaching abilities, contractual obligations, and to meet the demands of the ever-changing environment of education (Saucier, 2010; Washburn et. al., 2001).

In the view of McLaughlin and Talbert (2006), Professional Development provides incessant opportunities for teachers to refurbish their knowledge and skills through the training they receive.

Yoon *et al.* (2007) reported that teacher professional development has significant impact on students' learning outcomes in several ways such as it leads to the improvement in



teachers' knowledge and skills; assist teachers develop effective knowledge and skills, which enhance their teaching, and effective teaching leads to better students' learning outcomes.

McCutchen *et al.* (2002) pointed out professional development has the potential to help teachers develop effective instructional strategies to enhance students' learning. However, to obtain optimum effect of professional development on students' learning, its framework has to be consistent with the curriculum materials that teachers use, the assessment and the accountability measures that guide student success.

In view of the above, professional development is simply the opportunity made available to teachers through training to refurbish their knowledge and skills in order to be in line with changing trends aim at enhancing effective delivering of instructions by teachers and ultimately convey better learning results for students. Professional development is not done for its seek but on its merit. That is, a need assessment must be carried out on the target population to ascertain its necessity. Against this back drop, this research seeks to ascertain or otherwise training for teachers of agriculture in pedagogy is needed or not.

#### **2.1.6 Needs Assessment**

According to Monetter (1997), the individual or group that falls short of the desirable standard is said to be in need. He explained that need is measured by comparing the characteristics of those in receipt of a service with others who are not. If these others exhibit the same characteristics and they are not receiving the required service, they are said to be in need.



Borich, (1980) described needs as a discrepancy or gap between "what is", or the present state of affairs in regard to the group and situation of interest, and "what should be", or desired state of affairs.

Tyler (1971) defined a need as a difference between a present condition and an acceptable norm. "Any difference between "desired status of learners and "current status of learners" equals a training need.

Mitchell (1993) described needs assessment as "an examination of the existing need for training within an organization". He explained that needs assessment identifies performance areas or programs within an organization where training should be applied.

Cohen *et al.* (2007) explained that needs analysis identifies the problem or need and then proceeds to identify the aims, content, implementation, target population and outcome of an intervention

Jean (2006) described Training Needs Assessment (TNA) as the method of determining if a training need exists and, if it does, what training is required to fill the gap. TNA seeks to identify accurately the levels of the present situation in the target surveys, secondary data and/or workshop. The gap between the present status and desired status may indicate problems which in turn can be translated into a training need. Training can reduce, if not eliminated the gap, by equipping the participants with knowledge and skills. The data on the present status are vital to the evaluation of the training cycle. These shall serve as the baseline data.

Adentwi (2005) viewed Needs Assessment (NA) as a critical examination of the society for which an educational proposal is being designed in order to identify the problems,



needs and aspirations, resources available and feasible solutions. It is the process by which educational needs are defined and priorities set for further curriculum work.

McNeil (1996) has defined need in curriculum as a condition in which a discrepancy exists between an acceptable state of a learner achievement or attitude and an observed learner state. By identifying those needs not being met by the curriculum, the curriculum worker is provided with the “basis for revising the curriculum in such a way as to fulfill as many unmet needs as possible”.

Oliva (1992) stated that the conduct of needs assessment is not a one-time operation, but a continuing and periodic activity. This stems from the fact that curriculum planning is a process and needs assessment serves as a form of diagnostic evaluative procedure for improving practice. This means that the attempt to assess the needs of senior high Agriculture Science Teachers must constantly be ongoing to ensure that every gap that develops in terms of their levels of competencies can easily be identified and appropriately filled.

According to Lundberg *et al.* (2010), TNA is a review of learning and development needs within an organization. It considers the skills, knowledge and behaviours that people need, and how to develop them effectively. A TNA is considered to be the foundation of all training activities. Careful examination of the various views espoused by several researchers pertaining to needs and needs assessment, it is made clear that need is gap, that is, the difference between the preferred state of affairs and the existing state of affairs. That is, the difference between where you are supposed to be and where you are currently operating from regarding performance areas within an organization. An



inspection of the existing gap to ascertain the need for training to bridge the gap represents needs assessment.

### **2.1.7 The Need for Training**

Training is a means of ensuring that government officials have the knowledge and right skills to be able to do their work effectively and competently. Training may be needed when there is a gap between the desired performance, and the current performance, and for which the reason for that gap is lack of skill or knowledge. Training may only be able to resolve part of the problem. Thus we need to analyze the problem and find out whether training will be able to resolve it. If training is necessary, we also need to define the objective of the training and how it will help the staff member(s) become more effective. This process is called a Training Needs Assessment.

Training may sometimes not be the only solution to a problem. There are many other means that impact on someone's ability to do their work including Lack of skills, knowledge, or experience, Not having the right equipment or resource, Not being encouraged by managers and colleagues to do the right thing, There are no standards or expectations that are set and communicated and finally Bad workplace morale or conditions (MOI/DOLA, 2004).

### **2.1.8 Purpose of Needs Assessment**

Needs assessment is necessary when there is dissatisfaction with the current situation and desire for change. Also when a gap or discrepancy exists between what is and what could be. A learning or performance gap between the current and desired condition is called a need. In the view of Jean (2006) TNA aims at the following situations.



- Solving a current problem
- Avoiding a past or current problem
- Creating or taking advantage of a future opportunity
- Providing learning, development or growth

### 2.1.9 Types of Needs Assessment

#### **Performance analysis or gap analysis:**

This deals with or answers questions concerning skill/knowledge deficiency and how these deficiencies could be addressed and whether training the appropriate way to fix this deficiency.

**Feasibility analysis:** Answers questions on why training is done? Is the benefit of training greater than the cost of the current deficiency?

**Needs versus wants analysis:** Why should this training be done? Is the deficiency tied to a need?

#### **Goal analysis:**

What is the specific behavior improvement behind a vague desire?

#### **Job/task analysis:**

What is the best and correct way to do this work? How can this job and task be broken down into teachable parts?





**Target group analysis:** Answers questions on who is the trainee for this training? What is known about them to help design and customize this training? What other groups might benefit from training?

**Contextual analysis:** This method answers questions about when will the training be presented. What are the other requirements to deliver the training successfully? (Jean, 2006).

This study adopted job/task base analysis of needs assessment in to agriculture pedagogical competencies.

#### **2.1.10 Survey Methods**

Data collection and analysis are essential parts of needs assessment. The most commonly used methods of data collection included:

**Structured Interview:** Qualitative research method are commonly employed in survey research to ensure that each interviewee is presented with the same questions in the same order and that answers can be reliably aggregated and that comparisons can be made with confidence between different survey periods.

Here, interviewers read the questions exactly as they appear on the survey questionnaire. The choice of answers to the questions is often fixed (close-ended) in advance, though open-ended questions can also be included within a structured interview.

**Semi-Structured Interview:** Unlike the structured interview, more general questions or topics relevant to the topics are initially identified and the possible relationship between these topics and the issues become the basis for more specific questions which do not



need to be prepared in advance allowing both the interviewer and the person being interviewed the flexibility to probe for details or discuss issues. New questions can be brought during the interview as a result of what the interviewee says, so the interview flows more like a conversation.

**Observation:** Observation of working environment and performance of officials (office materials, communication tool, IT system, means of circulating the information).

**Questionnaire Survey:** Questionnaire is a survey instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents. They are often designed for statistical analysis of the responses.

**Focus Group discussion:** Qualitative research method whose purpose is to obtain in depth information on ideas and perceptions of a group and also to be more than a question-answer interaction.

A relatively small meeting (generally six to twelve participants) convened for a specific purpose under the direction of a facilitator, during which group members talk freely and spontaneously about a certain topic.

**Workshop:** An education seminar or series of meetings emphasizing interaction and exchanged of information among a usually small number of participants developing skill or common understanding through some types of application. Discussion on verification of identified staff training needs in the returned TN questionnaires and interview results (MOI/DOLA, 2004).



TNA is optimized when a combination of data collection methods is used to analyze quantitative and qualitative data. Regardless of which methods are used to collect and analyze data, it is important to consider the reliability, validity and trustworthiness of the data.

Due to the time constraints, this study adopted closed-ended structured questionnaire to survey the teachers as it is simple, quick, easy, and can be used to collate a lot of data in shortest possible time. However, the method is associated with some disadvantages including researcher may not get important information, People may not send back survey and it may be hard to understand some responses.

#### **2.1.11 Agriculture in Ghana**

The teaching and learning of agriculture permeates all levels of education in Ghana but General Agricultural Program and Integrated Science (core) of which agriculture is a major component are taught to students in Senior High Schools. Agriculture is the application of scientific principles to the growing of crops and rearing of animals for benefit of man. Agriculture is a blend of many of the basic pure and applied sciences for example botany, zoology, chemistry, and genetics among others.

The importance of agriculture in the national economy is well recognized in terms of food production, income generation and employment opportunities. However, the potential of agriculture in Ghana is marginally utilized (MOE & CRDD, 2010). Government policy is therefore to modernize the agricultural sector in such a way as to make Ghana an agro-industrialized country leading to the rural transformation of the



country. The policy aims at improving the productivity of small-scale producers while actively promoting the emergence of medium and large-scale agricultural enterprises.

In line with government policy, it is the responsibility of Ministry of Education to review agricultural education to ensure the development of well-trained agricultural work-force including managers and specialists of various kinds. There is the need for a broad-based training in agriculture to equip agricultural students with scientific, vocational and technological competencies to enable them fit into various sectors of agriculture. The agricultural training offered at the SHS level and particularly in the study of General Agriculture, lays the foundation for further work in agriculture at the tertiary level.

MOE and CRDD (2010) report of the New National Curriculum on Agriculture, the General Agriculture syllabus is designed to help Senior High School students with the objective to:

1. appreciate the importance of agriculture in the socio-economic development of Ghana,
2. acquire decision-making skills through the scientific principles of observation, data collection, analysis and interpretation,
3. develop skills and attitudes required for productive and profitable agriculture through practice and experiential learning,
4. recognize agriculture as a business and a viable livelihood option,
5. develop positive attitudes, interests, habits and good practices in agriculture,
6. be aware of the roles of extension service in the agricultural value chain,
7. recognize job opportunities in agriculture,



8. acquire techniques for efficient management of agribusinesses,
9. acquire requisite knowledge and skills needed for further training in agriculture.

For the achievement of these objectives, it is necessary to give due emphasis to the teaching of agriculture by equipping the teachers and other stakeholders competencies to deliver quality education

### **2.1.9 The Study Area and Participants**

The study was carried out in Tamale which is the principal center of education in the Northern region of Ghana. Education in the area is considered an important means of improving the socio-economic status of the people, families and communities at large. Thus, improving the literacy rate and ensuring equity in access to education are among the priority areas of the city. The city has about 742 basic schools. This comprises 94 kindergartens, 304 primary schools, 112 Junior High and 12 public Senior High Schools, the rest are technical and vocational institutions, two colleges of education, and three universities:- two public and the other private.

The respondents for the study were 66 Senior High Schools (SHS) teachers who are teaching agricultural science in the 12 Senior High Schools within the city. These schools are:

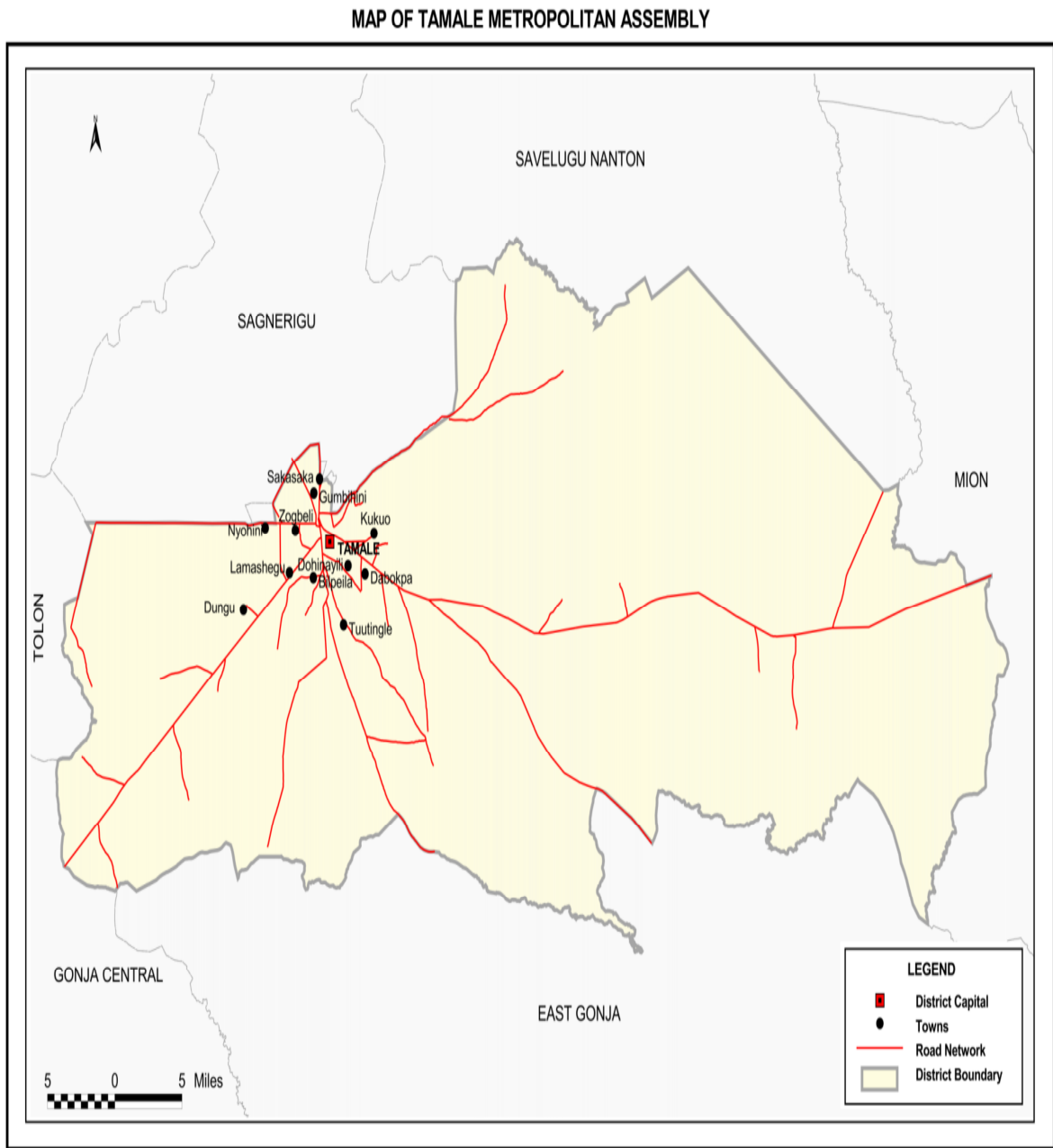
1. Tamale Senior High School,
2. Ghana Senior High School,
3. Northern School Of Business,
4. Business Senior High School,
5. Tamale Girls Senior High School,



6. Vitting Senior High School,
7. Kalpohini Senior High School,
8. Tamale Islamic Senior High School,
9. St Charles Senior High School,
10. Adventist Senior High School,
11. Presbyterian Senior High School And
12. Anbariya Senior High School

There exist also private schools in all the stages of education in Tamale. Despite basic education being almost free, most parents especially the rich and the enlightened preferred to send their wards to the private institution. This is because private schools are perceived to perform better academically compared to the public ones. As a result of this, people are investing their resources establishing private schools most especially at the basic level. Most people opt to send their wards to the private schools at the expense of the public ones. This is because people have lost confidence in the public schools when it comes to performance and discipline. What I noticed to be the difference between the public and the private schools is supervision and monitoring. Supervision and monitoring is high in the private schools as compared to that of the public school. The story is, however, different at the senior high school level. The drift is towards the public schools as against the private ones. This has resulted in most of the private senior high schools established in Tamale being faced with extinction. The reason might lie in the infrastructural gap between the public and the private schools. There is heavy investment in infrastructure by government which the private person cannot afford.





**Figure1: Map of Tamale**

Source: GSS, GIS

Tamale is the capital city of the Northern Region of Ghana. It is Ghana's fourth-largest city. It has a 2013 projected population of 360,579 according to the 2010 census and the fastest-growing city in West Africa. The city is located 600 km north of Accra. Most

residents of Tamale are Muslims. Tamale is located in the Kingdom of Dagbon. The local chiefs and the district chief of Tamale are subservient to the over lord of Dagbon called Yaa-Naa in Yendi. Due to its central location, Tamale is a hub for all administrative and commercial activities in the region. The center of the city hosts regional branches of most financial institutions and a considerable number of international nongovernmental organizations. Tamale has developed and transformed significantly in the last two decades. The new dimension of Tamale development is the rush by various companies to open branches in Tamale. The hospitality industry has grown significantly, with new hotels and guest houses built around Tamale. In Tamale, one could find an architectural blend of traditional mud houses and more modern buildings. Tamale's new and modern facilities include the newly built Tamale sports Stadium, Tamale Teaching Hospital, University for Development Studies among others. Further improvements have been made, particularly to Tamale's road system. Despite Islam being the dominant religion practiced by the people in the city and its environs, they co-exist well with other religious groupings. Acquisition of land is very easy and relatively affordable depending on its location in the city. The inhabitants are hospitable and easy going.

## **2.2 Relevance Theories to the Study**

The study was guided by four theories namely: Borich Model, Theory of Self-Efficacy, Theory of Instructional Efficacy and Theory of Adult Learner

### **2.2.1 The Borich Model**

Borich, (1980) developed Needs Assessment Model. It is designed for conducting follow-up studies of pre- service and in-service training programs. It is created to control type





and quality of data. It identifies gaps in *what* should be expected vs. *what* is prevailing, that is, *what* a teacher should be able to do vs. *what* the teacher can do.

According to Borich, in order to effectively conduct meaningful professional development needs assessment, training institutions must possess a method which improves their training programs. He developed the Needs Assessment Model to accomplish that task. A specific model for collecting data that has been established prior to questionnaire development provides a precise scheme in order to analyze and interpret the data.

The Borich Needs Assessment Model (BNAM) uses Mean Weighted Discrepancy Scores (MWDS) to determine the level of priority as reported by the teachers' perceived level of importance and perceived level of attainment. Borich defined a training need as "a discrepancy between an educational goal and trainee performance in relation to this goal". This definition can be applied to a professional development need. By addressing discrepancies as *what* is and *what* should be training needs could be conceptualized. He defined "what is" as measured behaviors, skills and competencies. It also looks at "*what* should be" as the overall goals of the training program. The difference between these two poles can be used to measure overall program effectiveness.

The model utilizes the following steps:

1. List Competencies (Teaching or Research) – these are enduring characteristics that result in superior on-the- job performance or are areas of personal capability that enable employees to successfully perform their jobs by achieving outcomes or successfully performing tasks. "All competency statements should be checked against program



activities and materials to ensure that they actually represent program objectives”, (Borich, 1980, p. 39).

2. Develop the Survey Instrument: this is most easily accomplished as a questionnaire in dual response format. That is

- Relevance of each competency to the job function (importance)
- Level of attainment of each competency (ability to perform).

3. Survey Participants: this is done in two ways – Conducted as a census of trainees or – Conducted as a sample of trainees.

4. Calculate Mean Weighted Discrepancy Scores (MWDS)

- Discrepancy Score (DS) is calculated as: Importance score – Ability score = DS
- Weighted DS (WDS) is calculated (for each respondent on each competency) as: DS \* Mean Importance score for each competency = WDS
- MWDS is calculated for each competency as: Sum of WDSs / n Each Competency = MWDS

5. Rank Competencies

- Ranking based on MWDS ratings
- Differences between perceived relevance (importance) and attainment (ability) for each competency produces identifiable “gaps”

6. Compare High Priority Competencies with Training Program Content

- Largest gaps should receive majority of training and development effort
- Match training and development delivery to competencies (needs)



## 7. Revise Program or Revise Competency

- Examine resources to best address training and development needs

This model is considered for this study due to the following reasons or advantages associated with it:

- It is a systematic process to prioritize competencies
- It is inclusive of stakeholders/participants' input
- The model accurately identifies “gaps” in competencies
- It maximizes training program resources

### 2.2.2 Theory of Self-Efficacy

The theory of Self-Efficacy as obtained from Bandura's Social Cognitive study. Bandura (1997) explained self-efficacy as the “beliefs in one's capabilities to organize and execute the course of action required to produce given attainments”. Self-efficacy influences a person's choices, actions, the amount of effort they give, their perseverance when faced with obstacles, their resilience, their thought patterns and related emotional reactions, and the final level of achievement.

Gist and Mitchell, as reported by Saucier (2010), found that some disparities in self-efficacy may be linked to the ability level of the subject matter; but variations in personality, motivation, and the task itself might influence efficacy perceptions of the teacher.

Schunk as explained by Saucier (2010) opined that “self-efficacy is a belief about what one is capable of doing; however, it is not the same concept as knowing what to do”



### **2.2.3 Instructional Efficacy**

Schunk (2004) suggested that Instructional efficacy is a personal belief about one's self capabilities to help students learn. He explained that instructional efficacy influences an educator's activities, effort, and persistence with students. He stated that if an educator possesses low efficacy they are likely to avoid planning activities that are beyond their ability levels. He, however, said that teachers who possess higher efficacy are most likely to develop more activities that are challenging; assist students to succeed; and persist with students having difficulties, create positive classroom environments, support student ideas and needs as they arise. He opined that an important challenge for both pre-service and in-service teacher education programs is to address the issue of increasing a teacher's instructional efficacy sources. The instructional efficacy sources come by means of professional development. In order to determine where a teacher is lacking in high levels of instructional efficacy, a needs assessment must be completed to allow for professional development opportunities to be created and offered.

### **2.2.4 Theory of Adult Learner**

Malcolm Knowles's theory of the adult learner is built upon Piaget and Erikson's theories. Knowles purposes that the adult learner carries a multitude of life experiences of learning. He stated that as an individual matures over time, their self-concepts transform from dependency to self-direction.

According Smith (2002) self-direction is the process in which individuals take the steps necessary to determine their learning needs, formulate learning goals, distinguish learning resources, selecting and putting learning strategies into practice and to examine learning outcomes.



Borich Needs Assessment Model will result in correctly identifying the agricultural pedagogical competency areas with the highest need for professional development and for pre-service and in-service instruction. For an educator to correctly perceive importance and their own ability for the selected competencies, many factors flash the educators' perceptions. One of such factors is an educator's self-efficacy.

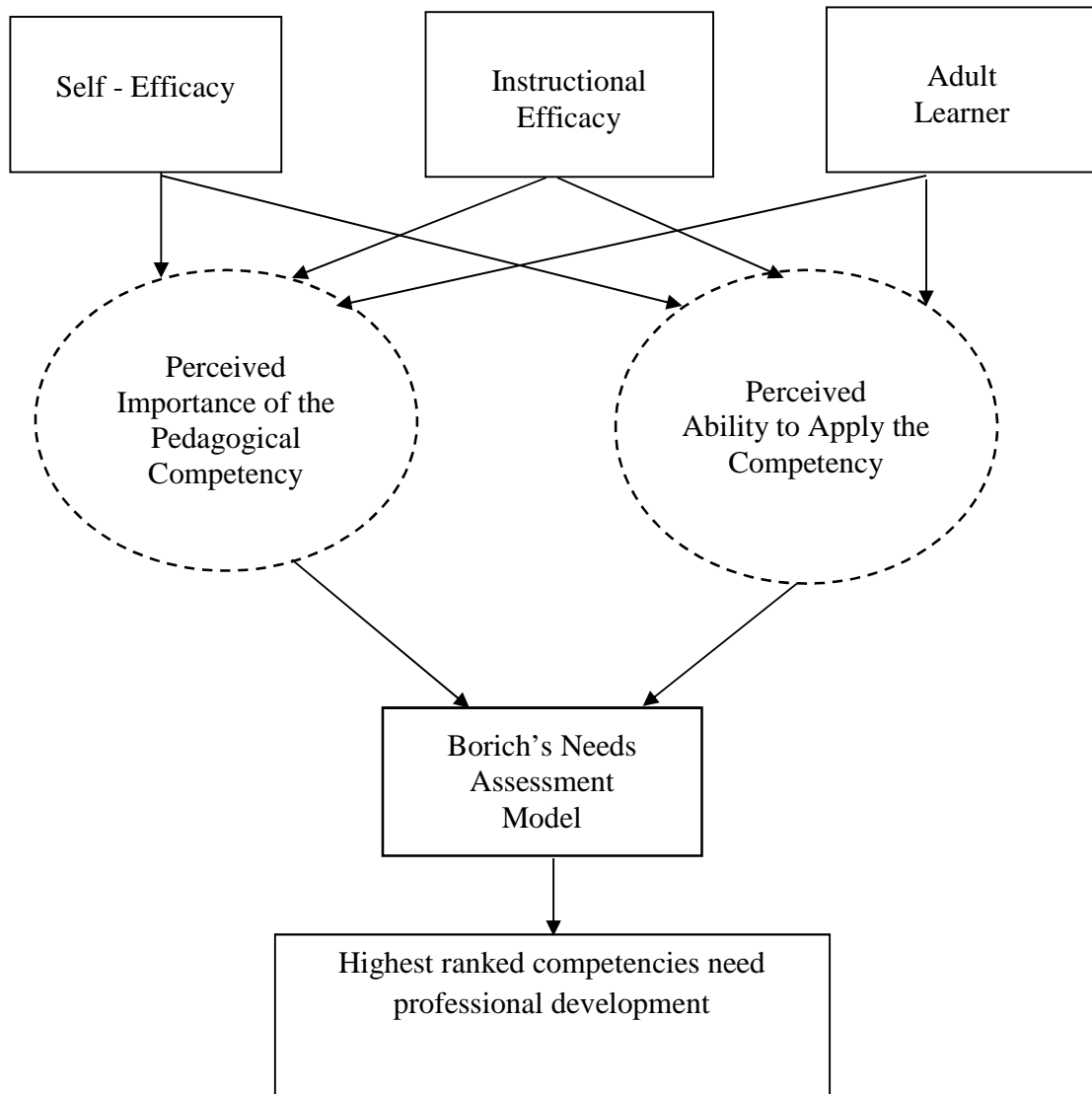
Bandura (1997) stated that one's self-efficacy is the belief in one's capabilities to organize and execute the course of action in order to generate a stated ability. In the context of this study, an educator's ability is influenced by their belief of their capability for performing the selected competency. Another factor affecting an educator's perceptions about the selected competencies is Instructional Efficacy.

Schunk (2004) suggested that one's belief about one's self capabilities to help students learn, instructional efficacy influences an educator's efforts with students. If an educator struggles with a certain competency, they are likely to perceive it as being of little to no importance.

Knowles' Adult Learner theory suggests that the adult learner carries a multitude of life experiences, which help to drive the adult to self-direct their learning needs; however, the adult's life experiences will bias their perception of competency importance, as well as their perceived ability.

Collectively, self-efficacy, instructional efficacy and self-directional influence the teacher perceived abilities and perceived importance of selected competencies. On the bases of these theories, Borich Needs Assessment Model can be used to rank the selected competencies in order to determine which competencies have the highest need for professional development in this thesis. This is summarized in the flow chart below.





**Figure 2: conceptual frame work**

Dennis *et al.* (2006) conducted a descriptive study to identify the teacher preparation and in-service needs of Georgia agricultural education teachers. The researchers used a modified version of the Minnesota Beginning Agricultural Education Teacher In-service Programming Needs Assessment (Joerger's, 2002 Model) to survey the teachers. They used SPSS to analyze the data collected. Cranach's Alpha was calculated to determine reliability of importance and competence for technical agriculture preparation needs,



teaching and learning, and program management preparation needs respectively. From the study, they indicated that teachers need additional preparation in technical areas such as biotechnology, aquaculture, and veterinary technology. Teachers also need support in developing pedagogical skills that will assist them in motivating their students to learn and increase their students' ability to think critically and creatively. They recommended that a number of pre-service/in-service preparation needs should be addressed by university faculty and state agricultural education staff.

Layfield and Dobbins (2004) carried out a study to identify specific in-service needs of beginning and experienced agriculture teachers in South Carolina. The researchers used Borich Needs Assessment Model to survey the teachers. They employed Statistical tool (SPSS) version 8.0 to analyze the data. From their study, they demonstrated that both beginning and experienced teachers require training in areas such as developing local adult education programs; developing SAE opportunities for students; preparing FFA degree applications; completing reports for local/state/federal accountability; and preparing proficiency award application. They referred to these as the five top common in-service training needs. They recommended that priority in planning professional development should be given to the top five common in-service needs of experienced and beginning agriculture teachers identified in their study.

Garton and Chung (1997) conducted a descriptive study to identify and prioritize the in-service training needs of beginning teachers of agriculture in Missouri using two assessment model- Borich and Quadrant model. They assessed the instrument for content and face validity with help of graduate associates, teacher educators, and state supervisors in Agricultural Education. Cronbach's alpha coefficient at 0.95 was calculated to



determine Reliability of instrument. The researchers found out that, using Borich and quadrant models, 12 and 16 of the 50 professional competencies were in greater need for training respectively. They concluded that when identifying the in-service training needs of beginning teachers of agriculture, using either the Borich or the quadrant analysis model are acceptable approaches that yield similar results. The researchers recommended that in-service training should focus on enhancing instruction and program development and administration. They suggested that the study should be replicated in other states to determine if the in-service needs of beginning teachers are consistent across states.

Omotesho *et al.* (2012) conducted a study to determine the ICT training needs as well as the determinants of such needs among extension officers in Kwara State, Nigeria. They employed Borich model to assess the training needs among extension officers. They also used a binary logistic regression model to identify the determinants of training needs among the respondents. They analyzed the data using descriptive statistics. They identified internet browsing and electronic mail presentation as the ICT application areas where training was most needed. The researchers identified job status as a major determinant of training needs among the respondents. They implied that, the higher the job status of the respondents, the lower the ICT training needs. They recommended that government should intensify the in-service training of extension officers in ICT.

Alibaygi and Zarafshani (2008) used descriptive study to identify in-service training needs associated with sustainability of Agriculture Extension Agents (AEAs) in West Iran. The researchers used the Borich model for the study. They used SPSS 11.5 to analyze the data collected. They established that agricultural waste management; participatory technology development, water conservation, integrated crop management,





and soil erosion were ranked high and require in-service training. The researchers recommended that, AEAs' in-service programs should focus on the established competencies and should be addressed through workshops.

Nongtdu *et al.* (2012) carried out a research into the training needs of agricultural extension personnel in Meghalaya, India. They used descriptive statistics and Spearman's Rank Correlation to analyze the data. The researchers established that, the extension personnel who are younger in age, with lesser exposure to training and short service length have higher needs for training to boost their performance. They again identified in order of importance Soil Science, Entomology, Agronomy, Plant Pathology, Nematology, Horticulture, Plantation Crops, Agricultural Extension, Agricultural Engineering, Agricultural Economics, areas related to IPR, Climate, Crop demonstration, Training planning and evaluation and Plant Breeding as the most important training need areas. They recommended that department of Agriculture and concerned training organizations need to arrange training covering the identified areas.

Farinde and Ajayi (2005) conducted a study on the importance of meeting the training needs of women farmers in livestock production to the rural development efforts of Nigeria. They analyzed data using simple frequency counts and weighted mean score. The researchers showed that women farmers' desired training was prominent in all operation concerning animal production. It was however visible in areas such as construction of modern livestock houses for poultry, goat, sheep and pig, compounding livestock feed, selecting readily compounded feed, breeding of livestock and general livestock or poultry health management. They asserted that for the rural development



effort to be attained, empowerment of women farmers through adequate training in all the expressed areas of training needs in livestock production cannot be over emphasized.

Jegade (2009) conducted a survey design study to examine the nature and impact of ICT trainings received by teacher educators in Southwestern Nigeria teacher training institutions. The researcher used descriptive statistics, one-way ANOVA and Chi-square to analyze the data obtained from the respondents. He established that more than half of the educators had been exposed to one form of ICT training or the other but trainings had hardly included the use of ICT in instruction. According to the researcher, most of those trained received their training directly from the institution and such trainings in ICT that teacher educators received had similar contents irrespective of the training but the trainings educators received had not impacted on classroom practices. He suggested that a more focused and teacher-targeted ICT training content freely delivered is what is now needed.

Madu and Iyiola (2013) used survey research design to identify the most prevalent needs of Nigerian Senior Secondary School teachers required for keeping them with the current demands of teaching and learning of science in Taraba State. They employed the Improvement Needs Index (INI) instrument developed by Zurub and Rubba (1983) for the study to determine the need gap between the means and possessed skills by the science teacher. The researchers established 10 items needed by the science teachers that require capacity building needs in planning of science instruction. They suggested that the identified items should be utilized to develop capacity building needs programs for a periodic retraining of science teachers in planning and designing science instruction as well as equipping teachers with generic pedagogical knowledge and skills.



Chizari *et al.* (2006) conducted a study intended to identify and prioritize the training needs of Multi-functional extension workers in Isfahan, Iran concerning sustainability. They analyzed the data using SPSS 11.5 for windows. Factor analysis was performed on the responses to some sections of questionnaire which were grouped into the five factors based upon factor loading using an orthogonal and varimax rotation. They also employed stepwise multiple regressions, Spearman correlation coefficient, and U-test to analyze the relationships between and among the variables. The researchers identified participatory extension, participatory techniques in rural development, biodiversity protection methods, sustainable fertilization methods, and improved utilization of indigenous knowledge of rural peoples as the most important areas requiring training and could be achieved through Cooperative learning techniques, Workshops, Group discussions and Lectures. They recommended that other stakeholders be contacted to assess the views of the findings as well as established benchmarks that will measure progress from the suggested training in meeting the goal of increasing extension worker effectiveness related to sustainability.

Febrianis *et al.* (2014) used a descriptive research approaches to determine the training needs of natural science teachers of SMP Negeri Pekanbaru by using Training Needs Analysis methodologies. The researchers established that the actual pedagogic competences of natural science teachers was below the ideal competence and that natural science teachers needed trainings for 10 pedagogical competence of which five most needed training program for the teachers were: the training of ICT, classroom action research, the theory and principles of learning on integrated natural science, curriculum development, and understanding on pupils' characteristics. The researchers recommended



that for training to be effective to improve the pedagogical competence of natural science teachers In House Training, specific training, and short courses will be appropriate methods.

Kirui (2015) used a survey research design to investigate the staff development and training needs that teacher of English desire to participate in Kericho County. The researcher adopted the needs assessment theory in assessing the needs. He employed both qualitative and quantitative research methodologies in the study and used descriptive statistics to analyze quantitative data. His study established that there is a discrepancy between the training needs of teachers of English and what was offered through the existing staff development and training program. According to the researcher, most of the teachers fell short of the expected competencies under investigation, and need more in-service training. He recommended that a thorough needs assessment should be carried out to clearly establish the training needs of teachers before implementing any training program.

Ernest *et al.* (2015) investigated on in-service needs of basic school Natural Science teachers in the New Juaben Municipality of Ghana. The researchers used data on the teachers' feedback on eight dimensions of science teachers' needs. They analyzed the data using the descriptive approach and chi square. The results obtained on the descriptive analysis indicated that the topmost in-service needs of Natural Science teachers were the acquisition of knowledge and skills in science subjects, generic pedagogical knowledge and skills and planning of science instruction. The chi square analysis showed that there is significant association between gender and science teachers' needs regarding the knowledge and skills in science subjects. They recommended among



others that in-service providers need to assess the in-service needs of participants before providing INSET services.

Dominic (2016) examined how teachers transfer their professional development knowledge to their classroom practices. The researcher sampled ninety-three (93) basic school teachers in the Kassena-Nankana West District for data collection. Descriptive statistics and Pearson Product-Moment correlation were used by the researcher to analyze the data. The study revealed that teacher effectiveness was relegated to effective teaching in basic schools and that professional development programs were relevant to their classroom management practices. He concluded that capacity building programs should be promoted regularly to build basic school teachers capacity for effective teaching.

Angeline and Rüdiger (2010) investigated on demographic profile and perceived INSET needs of Secondary Mathematics Teachers in Limpopo province. The researchers employed Science Teacher Inventory of Needs for Limpopo province (STIN-LP) to select thirty-four (34) experienced secondary Mathematics teachers for the study. They used descriptive statistics and chi-square to analysis the data obtained. The study identified that most teachers need was directed towards motivating learners to learn Mathematics, using audio-visual equipment and applying mathematics to daily life of learners. The least needs identified were the history of mathematics, improving content knowledge, how mathematics is used in society, and teaching large classes. They recommended that INSET providers should make use of the findings in order to plan comprehensive INSET programs in future for Mathematics teachers.

Sam (2009) investigated on the ICT competency levels of in-service teachers and to determine their professional development needs in the use of technology in the



classroom. The researcher sampled 238 participants to respond to a survey questionnaire. He used descriptive statistics to analyze the data obtained. The results of study indicated that in-service teachers in Nigeria are not competent in many skill areas in ICT and in pedagogical skills such as classroom management skills, creating student-centered learning environments, and developing innovative ways of using technology to enhance teaching and learning. His research also revealed that in-service teachers preferred attendance at conferences/seminars, university courses, and mentoring as the major modes of training in ICT skills. He recommended that all in-service teachers should be trained to use a variety of basic computer software for research purposes.

Michael *et al.* (2014) conducted a research to establish the effect of training needs assessment on employee commitment among employees of the Jomo Kenyatta University of Agriculture and Technology (JKUAT). The researchers employed both quantitative and qualitative approaches to obtained data. They used descriptive and inferential statistics to analyze data obtained. The study established that training needs assessment in JKUAT and other Public Universities was not being done effectively and thus led to lack of commitment by employees to their jobs. They concluded that the most significant factor in regard to employee commitment should be focused on Training Needs Assessment.

Oluwatayo *et al.* (2014) carried out a study on the competencies of graduate teachers who graduated from teacher education programs between the years 2005 and 2010 in Nigeria. They analyzed data obtained using descriptive statistics. The results obtained showed that the teachers possessed low competence in ICT skills but showed high competency in



didactic and pedagogic skills which vindicated the teacher from the societal point of view that the poor performance of students are due to teacher's incompetency.

Amy *et al.* (2010) carried out a study to determine what learning gaps student teachers brought to the student teaching experience. The researchers employed the Borich Model in the study. They used Excel and SPSS to analyze data obtained. Reliability of importance and competence for each competency was determined using Cronbach's alpha at  $\alpha = .87$ . The study revealed that the pre-service teachers needed additional preparation in developing teaching skills such as managing student behavior problems, motivating students to learn, teaching students to think critically and creatively, and conducting parent-teacher conferences. It was, however, revealed that the teachers demonstrated competency in using computer in the classroom, multimedia equipment in teaching, assessing and evaluating student performance, organizing and supervising teaching laboratories, and teaching problem solving and decision-making skills.

Agbulu and Ademu (2010) examined the availability of information and communication technology in Nigeria secondary schools. The researcher sampled 420 Agricultural science teachers for the study. They used descriptive statistics to analyze the data obtained. The research revealed that information and communication technology were not utilized for teaching and learning in secondary schools. They recommended that training of agricultural science teacher should be revised to reflect knowledge and skills related to the use of information and communication technologies for teaching and learning of agricultural sciences in secondary schools.



Ajayi and Modupe (2013) undertook a study to determine the in-service preference of teachers in the multidisciplinary approach to implementation of environmental education curriculum in Cross River State, Nigeria. They adopted the descriptive survey design which involved 737 teachers sampled from 67 public secondary schools in the three education zones of Cross River State. The result revealed that teachers' prefer workshop as a mode of professional development. They recommended that in the adoption of the multidisciplinary approach in the implementation of EE curriculum, In-service training programs should be organized on the basis of teachers' competency needs and subject area using workshops.

Lawal *et al.* (2014) sought to identify the competency capacity building needs of teachers of agricultural science in the utilization of school farm for skill acquisition among secondary school students in Ondo State, Nigeria. The researchers adopted the survey research design for study. Sampling was not utilized as the entire population was used. Internal consistency of the instrument was determined using Cronbach alpha reliability method. The study revealed that teachers of agricultural science needed capacity building in planning and organizing school farm, implementing school farm practical, coordinating and evaluating school farm practical. They recommended that retraining programs for the identified competencies using seminars, workshop and long vacation courses be carried out for teachers.

George and Emmanuel (2015) carried out qualitative research to explore the perspectives of senior high school teachers on the availability of continuing professional development programs in the Sekyere East district in the Ashanti region of Ghana. They sampled Thirty-two (32) teachers for study. Content analysis techniques and descriptive analysis





and statistics were employed to analyze the data obtained. The study revealed that teachers have access to distance learning facilities and graduate courses. The study also showed that professional development programs takes the form of workshops, in-service training, conferences, and seminars but were however, traditional, rarely organized, and limited in access which make them less effective in ensuring instructional quality and learning outcomes. The researchers recommended that a policy framework be established to ensure that teachers complete a certain amount of professional development activities every given years, specify certification and licensing requirements for pre-tertiary teachers and invest the right amount of resources into the programs of teacher professional development for improvement in students' learning outcomes.

Kankam and Bernard (2013) conducted a study to assess the training needs of tutors in the colleges of education in the Central Region of Ghana. A total of 111 tutors were sampled for the study. Data obtained were analyzed using descriptive statistics. The study showed that tutors get to know about programs from friends and coworkers, most tutors showed positive attitude towards staff development opportunities and also considered seriously training programs relevant to their areas of specialization. They researchers recommended that periodic orientation programs be organized to update College of Education tutors on training relevant to the performance of their academic duties.

Oden and Kankam (2013) conducted a study on perceived curriculum innovation needs for pedagogical and ICT competencies among undergraduate students of Education in Ghana. Four hypotheses were formulated to direct the study. The researchers sampled 300 Education students of University of Cape Coast for the study. Data obtained was analyzed using descriptive statistics, Pearson's Product Moment Correlation Coefficient



and Analysis of Variance. The study revealed that all the identified pedagogical aspects was perceived as hugely needed by the students. They recommended that for the trainee teachers to be true facilitators of learning, they must be trained in the identified competencies that can facilitate their job performance.

In summary, it is worth noting that, in this fast-changing educational environment to meet the demands of the global challenging and competitive environment, it can only be proper if regular professional developments needs assessment of teachers is carried out.

Layfield and Dobbins indicated that teachers are confronted with several challenges of providing satisfactory learning environment for students in order to prepare them for useful lives in today's rapid growing world (2002). They further stated that Learning for teachers does not end after the degree but is a lifelong endeavor.

In order to appropriately assess the professional development needs of agriculture teachers there are many variables that must be taken in to consideration. Such variables included; teacher's self-efficacy, instructional efficacy and how these teachers learn. These variables influence teacher's perceived abilities and perceived importance of selected competencies. Based on the teachers' perceptions on both ability and importance scores, Gary D. Borich's Needs Assessment Model can be used to rank the selected competencies in order to determine which competencies have the highest need for professional development. This process has been used in many related studies as discussed and is therefore adapted for these current thesis.



## CHAPTER THREE

### METHODOLOGY

#### 3.0 Introduction

This chapter presents the methods and processes use to obtain data for this research. It provides brief explanations to the following subsections including research design, population of the study, sample and sampling techniques, research instruments, reliability and validity of the instrument, data collection, the model used for the study and data analysis plan.

#### 3.1 Research Design

According to Orodho and Kombo (2006), research design is the plan, structure and strategy of investigation conceived so as to obtain answers to a research questions and to control variables. This study adopted descriptive research design as it was deemed more appropriate for the study because according to Fraenkel and Wallen (2000), descriptive research deals basically with obtaining data to determine specific characteristics of a group. This study sought to obtain information about the pedagogical competency needs of agriculture teachers in Senior High Schools in Tamale towards the teaching of agriculture and to determine the most appropriate methods through which training could be carried out to yield desire results.

#### 3.2 Population

Bryman and Bell (2003) describe a study population as” the whole group that the research focuses on”. The population for this study comprised Agricultural Science Teachers in Tamale Metropolis. The target population for the study was all public Senior High school Agriculture Teachers in Tamale.



### **3.3 Sample and Sampling Technique**

Sampling is the process of selecting units from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen. For this study a census of the population was used. For this reason, sampling was not utilized.

### **3.4 Research Instrument Used**

The research instrument used to obtain information for the study was questionnaire as shown in the appendix 'A'. The questionnaire was made up of closed-ended items. This instrument was chosen to allow the respondents the opportunity to answer the questions at their convenience. The use of questionnaire is cost effective as the target population could be contacted at a relatively low cost. Also, it is easy to administer, simple and quick for the respondent to complete.

#### **3.4.1 Validity and Reliability of the Instrument Used**

Content validity is explained to mean the extent to which a measuring instrument provides adequate coverage of the topic under study. According to Mugenda and Mugenda (2003) "content validity of the measuring instrument refers to the accuracy and meaningfulness of inferences which are based on the research results". It is the degree to which results obtained from the analysis of the data actually represent the phenomenon under study. In order to determine the content validity of the instruments, the researcher discussed the items with experts and supervisors in the department of agricultural education who helped to determine the relevance and content validity of the questionnaires developed. Reliability is concerned with precision and accuracy. Research is reliable, if demonstrates similar results when performed on a similar group of



respondents in a similar contact, (Cohen et al, 2000). Reliability issues could not be addressed as the researcher was constraint with time to carry out pilot test to enable reliability co-efficient to be calculated.

### **3.5 Data Collection**

This study made use of the entire agriculture Science Teachers in all Senior High Schools in Tamale as their number was small. Primary data was obtained for the study using structured questionnaire administered to sixty-six respondents. A five point likert-type rating scale was used to measure the respondents' Perceived level of importance and perceived level of abilities of selected competencies. Fifty pedagogical competencies were formulated for the study as in appendix 'E'. The formulation was based on the content and methodology of teaching agriculture science guided by previous works. Rankings were done using the mean values to determine the respondent's perceived level of importance and abilities. Mean Weighted Discrepancy Scores (MWDS) values were estimated for each competence in order to determine pedagogical competency needs.

### **3.6 Borich Model**

The model used for this descriptive study was Borich (1980) Needs Assessment Model, using mean weighted discrepancy scores to rank competencies. Borich maintained that in order to conduct meaningful professional development, training institutions must possess a method in which to improve their training programme. Borich developed the Needs Assessment Model to accomplish that task. The Needs Assessment Model uses mean weighted discrepancy scores to determine the level of priority as reported by the teachers' perceived level of importance and perceived level of abilities. Borich defined a training



need as “a discrepancy between an educational goal and trainee performance in relation to this goal”. This definition is applicable to a professional development need. By addressing discrepancies as what is and what should be training needs could be conceptualized. Borich explained *what is* as measured behaviors, skills and competencies and *what should be* as the overall goals of the training program. The difference between these two poles can be used to measure overall program effectiveness using mean weighted discrepancy scores. Borich Needs Assessment Model utilizes five steps and they include the following:

1. List the desired competencies.
2. Conduct the survey using a questionnaire.
3. Rank the competencies using mean weighted discrepancy scores based on the ratings collected from the questionnaire.
4. Compare the high priority competencies to the professional development opportunity.
5. Modify the focus of professional development to match the highest ordered competencies.

The first step is to list the desired competencies. There are many ways in which to obtain a list of desired competencies.

Borich suggests using a list of program objectives checked against program activities and materials to ensure a full representation of the program. Then these statements can be used to construct the actual questionnaire.

The second step involves conducting the survey as outlined by Borich. A census or random sample of subjects is asked to rate: 1. the relevance of each competency to their



current job function or perceived future job function. 2. Their current level of attainment of each competency or perceived ability.

The third step is to rank the competencies based on the ratings received from the questionnaire. Borich tells us to calculate the difference between the perceived level of importance and ability for each of the selected competencies. The resulting differences are then arranged by relative weight, calculated by multiplying the discrepancy score by the average perceived importance for all of the respondents. Mean weighted discrepancy scores (MWDS) range from 20 to negative four. A positive MWDS of 20 means the competency has an extreme need for professional development. A negative four MWDS means the competency has an extreme no need for professional development. The discrepancies with the greatest positive rank difference have the highest priority for professional development and those discrepancies with the lowest positive (sometimes-negative) rank have a lesser need for professional development.

The fourth step is to compare the high priority competencies to the professional development opportunity. The competencies with the highest priority for professional development from step three are used to choose the format for professional development.

Borich says if a competency is highly valued but poorly performed, a problem may be insufficient training rather than ineffective training or professional development.

The fifth step is closely connected to fourth step in which Borich recommends modifying the focus of professional development to match the highest order competencies from the survey.



This Model can be adapted to fit a variety of studies for many different institutions. The basis for the model remains the same. The model is a self-evaluation procedure, which relies on respondents to make judgments about their own abilities.

### 3.6.1 Assumption of the Borich Model

The underlying assumption of the model is whether the respondents can best judge their own abilities objectively. This assumption is inherently applicable in this study.

### 3.6.2 Steps of Determining MWDS

Prioritizing Competencies for Training Programs

Calculate Mean Weighted Discrepancy Scores (MWDS)

•Discrepancy Score (DS) is calculated as: **Importance score – Ability score = DS**

•Weighted DS (WDS) is calculated (for each respondent on each competency) as:

**DS \* Mean Importance score for each competency = WDS**

•MWDS is calculated for each competency as: **Sum of WDSs / n Each Competency =**

**MWDS**

MWDS Formula:

$$MWDS = \frac{(\text{Importance} - \text{Ability}) M_{\text{Associated Rating}}}{n}$$

Where: M associated rating = mean associated with each competence.

n = Number of respondents.





Example:

<b>Data set</b>		
<b>Respondents</b>	<b>Importance rating</b>	<b>Ability rating</b>
A	5	1
B	3	2
C	4	5
D	5	1
E	5	4

1. calculating the Discrepancy score (DS) by subtracting the ability rating from the importance Rating

<b>Respondents</b>	<b>Importance</b>	<b>Ability</b>	<b>Discrepancy</b>
A	5	1	4
B	3	2	1
C	4	5	-1
D	5	1	4
E	5	4	1

2. Calculating Mean importance

$$\text{Mean importance} = \frac{5 + 3 + 4 + 5 + 5}{5} = \frac{22}{5} = 4.4$$

3. Calculating the weighted Discrepancy score for each respondent by multiplying the Discrepancy score by the mean importance.



Respondents	Importance	Ability	Discrepancy	Weighted Discrepancy score
A	5	1	4(4.4)	17.6
B	3	2	1(4.4)	4.4
C	4	5	-1(4.4)	-4.4
D	5	1	4(4.4)	17.6
E	5	4	1(4.4)	4.4

4. Calculating the mean weighted Discrepancy score by finding the sum of the weighted Discrepancy score and dividing the sum by the number of observations.

$$\text{Mean Weighted Discrepancy Score (MWDS)} = \frac{17.6 + 4.4 - 4.4 + 17.6 + 4.4}{5} = \frac{39.6}{5} = 7.92$$

A competency with a mean weighted discrepancy score of 7.92 means that the competency required training.

### 3.7 Data Analysis Plan

SPSS Statistic and Stata version 20 were software packages used to analyze the data obtained. The data was analyzed in eight different constructs consisted of the fifty competencies formulated. The constructs included: Engaging and supporting students learning, creating and maintaining effective environment, organizing subject matter, planning of instruction and assessing students learning. The others were execution of instruction, management and profession role and development.

A five point likert-type scale was used in the measurement of the respondents' perceived importance and perceived abilities of selected competencies.



For the perceived importance, the rating scale ranges from 1 to 5 with “No Importance” = 1, “Below average importance” = 2, “Average importance” = 3, “Above average importance” = 4 and “Utmost importance” = 5.

For the perceived abilities, the rating scale range from 1 to 5 with “No ability” = 1, “Below average ability” = 2, “Average ability” = 3, “Above average ability” = 4 and “Exceptional ability” = 5.

On the suitable method for training to be carried out, the rating scale range from 1 to 5 with “not preferred” = 1, “less preferred” = 2, “more preferred” = 3, “most preferred” = 4 and “highly preferred” = 5.

The rating scale employed indicated that the competencies are relative to the agriculture teachers.

Demographic characteristics of the teachers were also included in the questionnaire and their frequencies and percentages were determined for analysis,

Rankings were done using the mean values to determine the respondent’s perceived importance a perceived abilities and preference of training methods.

Mean Weighted Discrepancy Scores (MWDS) values were used to determine the teachers pedagogical competency needs. According to Edwards and Briers (1999) MWDS is used because it offers a more valid picture of needs than openly asking respondents for a ranking.

The resources used for information on the study included the UDS library and the internet.



## CHAPTER FOUR

### THE FINDINGS AND DISCUSSION OF THE FINDINGS

This chapter presents the findings and discussions based on the research objectives.

#### 4.1 Demographic Characteristics of Agricultural Science Teachers

**Table 4.1: Demographics of Agricultural Teachers in Tamale Public Senior High Schools (n=66)**

Demographic		Frequency(f)	Percentage (%)
Age	20 to 25	8	12.1
	26 to 30	1	1.5
	31 to 35	17	25.8
	41 to 45	38	57.6
	46 and above	2	3.0
Sex	Male	50	78.5
	Female	16	24.2
Highest academic qualification held	Diploma	4	6.1
	Bachelor	43	65.2
	Masters	17	25.8
	HND	2	3.0
Highest professional qualification held	Post-Secondary	23	34.8
	Diploma	20	30.3
	Graduate	17	25.8



Experience in teaching agriculture	None	6	9.1
	1 to 5	16	24.2
	6 to 10	1	1.5
	11 to 15	8	12.1
	16 to 20	13	19.7
	21 to 25	27	40.9
	26 to 30	1	1.5
	Professional status	Yes	60
No		6	9.1
Availability of school farm	Yes	35	53.0
	No	31	47.0
In-service training attended	Yes	47	71.2
	No	17	28.8

Table 4.1 above lists eight demographic characteristics of the study participants.

The study made use of sixty-six respondents who comprised fifty males and sixteen females representing 75.8% and 24.2% of respondents respectively. This is so because the teaching profession, like any other profession in Ghana, is male dominated. In addition, the sciences including agriculture, is mostly avoided by females due to the perception that sciences are difficult. Out of the sixty-six respondents, thirty-eight representing about 58% were between the ages of 41 to 45. In terms of academic qualification, forty-three of the respondents representing 65.2% hold Bachelor's degree, twenty-three of the respondents representing 34.8% hold Teacher's Certificate 'A' whilst six teachers representing 9.1% are non-professionals. In effect, about ninety-one percent



(91%) of the teachers are professionals and should be competent enough to handle students. The results also revealed that twenty-seven of the respondents constituting 40.7% have teaching experience of between 21 to 25 years. In all, forty-nine of the respondents representing 74.3% have over 10 years of teaching experience. This implies that the schools have teachers with vast experience and competence to deliver quality education.

#### **4.2 Perceived Importance of Agricultural Teachers**

The Tamale Senior High School Agriculture Teachers were asked to rate their perceived level of importance of the fifty agricultural pedagogical competencies in eight different constructs. The constructs were as follows; engaging and supporting students learning, creating and maintaining effective environment, organizing subject matter, planning of instruction, assessing students learning, execution of instruction, management and profession role and development.

These are discussed in the following sub-sections.

##### **4.2.1 Engaging and Supporting Students Learning Construct**

Engaging and Supporting Students Learning Construct consisted of four (4) competencies; connecting students' prior knowledge with learning goals, facilitating learning experience that promote autonomy, solving problems that make subject matter meaningful and self-directed reflective learning for students.



**Table 4.2: Perceived Importance for Engaging and Supporting Students Learning**

**Construct (n = 66)**

<b>Competence</b>	<b>1%</b>	<b>2%</b>	<b>3%</b>	<b>4%</b>	<b>5%</b>	<b>M</b>	<b>SD</b>
Connecting students' prior knowledge with learning goals	10.6	9.1	22.7	30.3	27.3	3.55	1.28
Facilitating learning experience that promote autonomy	7.6	13.6	28.8	28.8	21.2	3.42	1.19
Solving problems that make subject matter meaningful	3.0	7.6	19.7	31.8	37.9	3.94	1.08
Self-directed reflective learning for students	4.5	10.6	24.2	31.8	28.8	3.70	1.14

Scale: 1= no importance, 2 = below average importance, 3= average importance, 4= above average importance, 5= utmost importance (Cannon, 2012)

Table 4.2 above lists the four (4) competencies with their frequencies and percentages for each of the importance scale choices. Solving problems that make subject matter meaningful ranked highest with a mean of 3.94. Second in rank is associated with self-directed reflective learning for students with a mean value of 3.70. Third rank item is connected to connecting students' prior knowledge with learning goals with an associated



mean value of 3.55. Lowest rank is linked to facilitating learning experience that promotes autonomy with a mean value of 3.42. The overall mean of 3.65 with an equivalent rating of “above average importance” implies that the respondents considered all four competencies important when engaging and supporting students learning in the classroom. Also with exception of facilitating learning experience that promote autonomy (mean=3.42; SD=1.19) that teachers perceive to be average importance, the other constructs for measuring engaging and supporting students were perceived to be above average importance. Specifically, Connecting students’ prior knowledge with learning goals (mean = 3.55; SD= 1.28), Solving problems that make subject matter meaningful (mean=3.4; SD=1.08) were perceive to be above average. Overall mean value is obtained by adding all the mean values of each competency in each construct divided by the number of competencies in the construct.

#### **4.2.2 Creating and Maintaining Effective Environment Construct**

Creating and maintaining effective environment construct contains five competencies: creating learning environment that engages student, establishing learning climate that promotes fairness, establishing and maintaining standards for students’ behavior, using instructional time effectively and planning and implementing classroom procedure.





**Table 4.3 Perceived Importance for Creating and Maintaining Effective**

**Environment Construct (n = 66)**

<b>Competency</b>	<b>1%</b>	<b>2%</b>	<b>3%</b>	<b>4%</b>	<b>5%</b>	<b>M</b>	<b>SD</b>
Creating learning environment that engages students	6.1	10.6	19.7	24.2	39.4	3.80	1.24
Establishing learning climate that promotes fairness	4.5	4.5	21.2	39.4	30.3	3.86	1.05
Establishing and maintaining standards for students behavior	3.0	6.1	19.7	43.9	27.3	3.86	0.99
Using instructional time effectively	3.0	3.0	22.7	34.8	36.4	3.98	1.00
Engaging and supporting students learning	3.0	6.1	13.6	37.9	39.4	4.05	1.03

Scale: 1= No importance, 2 = below average importance, 3= Average importance, 4= above average importance, 5= Utmost importance (Cannon, 2012)

Table 4.3 above lists the five competencies with their frequencies and percentages for each of the importance scale choices. Of the five competencies, engaging and supporting students learning is rank first with an average mean value of 4.05. This is followed by using instructional time effectively with mean value of 3.98. Third rank was connected to establishing learning climate that promotes fairness and establishing and maintaining standards for student’s behavior with an equivalent mean values of 3.86. The lowest rating was linked to creating learning environment that engages students with a mean of



3.80. The overall average mean of 3.91 with corresponding rating of “above average importance” indicates that the instructors considered creating and maintaining effective environment construct very important.

#### 4.2.3 Organizing Subject Matter Construct

Organizing Subject Matter Construct contained four competencies: demonstrate knowledge of subject matter, interrelating ideas and information within and across subject matter areas, developing students’ understanding through appropriate instructional strategies and using materials and technology to make subject matter accessible.

**Table 4.4: Perceived Importance for Organizing Subject Matter Construct (n=66)**

scale	1%	2%	3%	4%	5%	M	SD
Demonstrate knowledge of subject matter	9.1	6.1	12.1	31.8	40.9	3.89	1.27
Interrelating ideas and information within and across subject matter areas	3.0	3.0	22.7	36.4	34.9	3.97	0.99
Developing Students’ understanding through appropriate instructional strategies	1.5	3.0	15.2	39.4	40.9	4.15	0.90
Using Materials and technology to make subject matter accessible	1.5	10.6	16.7	37.9	33.3	3.91	1.03



Scale: 1= No importance, 2 = below average importance, 3= Average importance, 4= above average importance, 5= Utmost importance (Cannon, 2012)

Table 4.4 above lists the four competencies for this construct with their frequencies and percentages for each of the importance scale choices. Developing students' understanding through appropriate instructional strategies was rank highest in this construct with a mean value of 4.15. This was immediately followed by interrelating ideas and information within and across subject matter areas with a mean of 3.97. Using materials and technology to make subject matter accessible assume the third position with a mean value of 3.91 and the last rank item was linked to demonstrate knowledge of subject matter with mean value of 3.89. The overall mean value of 3.98 with a corresponding rating of "above average importance" signposts the belief by the respondents that organizing subject matter plays a critical role in instructional process and therefore considered important by the respondents.

#### **4.2.4 Planning of Instruction Construct**

This construct consist of ten competencies: drawing on and valuing students' background, developing and sequencing instructional materials, involving student in planning, designing short and long term plan to foster learning, selecting method of evaluating student performance, determining students' needs and interest and selecting teaching techniques for a lesson, plan introduction of lesson, select tools and/or equipment for a lesson and plan summary of a lesson.



**Table 4.5: Perceived Importance for Planning of Instruction Construct (n=66)**

Scale	1%	2%	3%	4%	5%	M	SD
Drawing on and valuing students' background	7.6	7.6	25.8	36.4	22.7	3.59	1.15
Developing and Sequencing Instructional Materials	1.5	6.1	21.2	33.3	37.9	4.00	0.99
Involving students in planning	16.7	10.6	21.2	28.8	22.7	3.30	1.38
Designing short and long term plan to foster learning	9.1	4.5	25.8	28.8	31.8	3.70	1.23
Select method of evaluating student performance	9.1	6.1	24.2	27.3	33.3	3.70	1.252
Determining students' needs and interest	12.1	4.5	18.2	43.9	21.2	3.58	1.23
Select Teaching techniques for a lesson	6.1	10.6	13.6	37.9	31.8	3.79	1.18



Plan introduction of a lesson	4.5	7.6	19.7	33.3	34.8	3.86	1.22
Select tools and/or equipment for a lesson	4.5	6.1	19.7	34.8	34.8	3.89	1.10
Plan summary of a lesson	3.0	7.6	22.7	37.9	28.8	3.82	1.04

Scale: 1= No importance, 2 = below average importance, 3= Average importance, 4= above average importance, 5= Utmost importance (Cannon, 2012)

Table 4.5 above lists the ten competencies in planning of instruction construct along with their frequencies and percentages for each of the importance scale choices. Developing and sequencing instructional material with a mean value of 4.00 rank highest. This was followed by select tools and/or equipment for a lesson with associated mean value of 3.89. The third rank was plan introduction of a lesson with mean value of 3.86, fourth rank was plan summary of a lesson with associated mean value of 3.82, fifth ranked item with mean value of 3.79 was linked to select teaching techniques for a lesson, sixth rank were select method of evaluating student performance and designing short and long term plan to foster learning with an equal mean value of 3.70, seventh rank was drawing on and valuing students' background having mean value of 3.59, eighth ranked item with mean value of 3.58 was linked to determining students' needs and interest, and the lowest rank with mean value of 3.30 in this category was connected to involving students in planning. but the overall average mean of 3.72 with a corresponding rating of "above



average importance “implies that the teachers considered planning of instruction very serious and were deeply concerned with the competencies related to planning of agricultural lessons. Also with the exception of involving students in planning (mean=3.30; SD=1.38) that teachers perceive to be average importance, the other competencies for measuring planning of instruction were perceived to be above average importance. Specifically, drawing on and valuing students’ background (mean= 3.59; SD=1.15), developing and sequencing instructional materials (mean=4.00; SD=0.99), and designing short and long term plan to foster learning (mean=3.70; SD=1.23) among others were considered to be above average importance

#### **4.2.5 Assessing Students learning construct**

Assessing Students learning construct was composed of four competencies: Communicating learning goals for students, using multiple sources of information, guiding students in assessing their learning, using results of assessment to guide instruction.



**Table 4.6: Perceived Importance for Assessing Students Learning Construct (n = 66)**

<b>Competence</b>	<b>1%</b>	<b>2%</b>	<b>3%</b>	<b>4%</b>	<b>5%</b>	<b>M</b>	<b>SD</b>
Communicating learning goals for students	10.6	7.6	19.7	31.8	30.3	3.64	1.29
Using multiple sources of information	3	6.1	21.2	43.9	25.8	3.83	0.99
Guiding students in assessing their learning	4.5	12.1	21.2	39.4	22.7	3.64	1.10
Using results of assessment to guide instruction	4.5	9.1	24.2	25.8	36.4	3.80	1.17

Scale: 1= No importance, 2 = below average importance, 3= Average importance, 4= above average importance, 5= Utmost importance (Cannon, 2012)

Table 4.6 lists the four competencies for this construct together with their frequencies and percentage for each of the importance scale choices. In this construct, using multiple sources of information ranked the utmost with a mean value of 3.83. The second highest



rank element with mean of 3.80 is related to using results of assessment to guide instruction. The third and the fourth rankings with equal mean values of 3.64 were connected with guiding students in assessing their learning and communicating learning goals for students. The overall average mean value of 3.73 with these competencies for a corresponding rating of “above average importance” established the importance the respondents attached to assessing students learning competencies.

#### 4.2.6 Execution of Instruction Construct

Execution of Instruction construct, comprised of ten competencies: using computers in classroom teaching, using multimedia equipment in teaching, teaching record keeping skills, teaching about public issues regarding agriculture, teaching agriculture knowledge and skills, motivating students to learn, teaching using experiments, teaching students problems solving skills, teaching agriculture’s relationship with the environment and planning and conducting field trips.

**Table 4.7: Perceived Importance for the Execution of Instruction Construct (n = 66)**

Competence	1%	2%	3%	4%	5%	M	SD
Using computers in classroom teaching	18.2	10.6	24.2	24.2	22.7	3.23	1.40
Using multimedia equipment in teaching	15.2	9.1	21.2	31.8	22.7	3.38	1.35





Teaching record keeping skills	1.5	12.1	27.3	33.3	25.8	3.70	1.04
Teaching about public issues regarding agriculture	9.1	7.6	19.7	30.3	33.3	3.71	1.26
Teaching agriculture knowledge and skills	4.5	6.1	19.7	39.4	30.3	3.85	1.07
Motivating students to learn	7.6	4.5	16.7	36.4	34.8	3.86	1.18
Teaching using Experiments	1.5	9.1	21.2	33.3	34.8	3.91	1.03
Teaching students problems solving skills	6.1	10.6	16.7	37.9	28.8	3.73	1.17
Teaching agriculture relationship with the environment	3.0	10.6	30.3	28.8	27.3	3.67	1.09
Planning and conducting field trips	4.5	6.1	21.2	36.4	31.8	3.85	1.09



Scale: 1= No importance, 2 = below average importance, 3= Average importance, 4= above average importance, 5= Utmost importance (Cannon, 2012).

Table 4.7 summarizes the frequencies and percentages for each competency for each of the importance scale choices. with the exception of using computers in classroom teaching (M=3.23; SD=1.40) and using multimedia equipment in teaching (M=3.38; SD=1.35) which were considered as average importance, the remaining eight competencies which included teaching record keeping skills (M=3.70), teaching agriculture knowledge and skills (M=3.85), motivating students to learn (M=3.86), teaching students problems solving skills (M=3.73), teaching agriculture relationship with the environment (M=3.67) planning and conducting field trips (M=3.85) , teaching about public issues regarding agriculture and teaching using experiments were categorized as possessing “above average importance”. The respondents indicated that teaching using experiments with a mean value of 3.91 is of topmost importance in terms of execution of instruction. Using computers in classroom teaching with mean value of 3.32 was rank the least importance and therefore considered to be less important when compared with other competencies within this construct as a whole. However, the overall average mean value of 3.69 with an equivalent rating of “above average importance” suggests that execution of instruction remains paramount to these teachers.

#### **4.2.7 Management Role Construct**

Management construct composed of seven competencies: know school policies and procedure, identify new tools and equipment needed, structure filing system for records and reports, device a filing system for instructional material, carryout approved



disciplinary actions when warranted, encourage students to exercise self-discipline and control outburst of fighting.

**Table 4.8: Perceived Importance for Management Role Construct (n = 66)**

Competence	1%	2%	3%	4%	5%	M	SD
Know school policies and procedure	10.6	9.1	15.2	30.3	34.8	3.70	1.32
Identify new tools and equipment needed	6.1	4.5	22.7	36.4	30.3	3.80	1.11
Structure filing system for records and reports	7.6	6.1	25.8	34.8	25.8	3.65	1.16
Device a filing system for instructional material	10.6	3.0	25.8	31.8	28.8	3.65	1.23
Carryout approved disciplinary	7.6	3.0	22.7	24.2	42.4	3.91	1.21



actions when warranted							
Encourage students to exercise self-discipline	3.0	4.5	15.2	37.9	39.4	4.06	1.01
Control outburst of fighting	6.1	3.0	15.2	34.8	40.9	4.02	1.12

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Scale: 1= No importance, 2 = below average importance, 3= Average importance, 4= above average importance, 5= Utmost importance (Cannon, 2012)

Table 4.8 above lists the seven competencies with their frequencies and percentages for each of the importance scale choices. In this construct, encourage students to exercise self-discipline rank the highest with a mean value of 4.06, the second highest rank element with mean of 4.02 is related to control outburst of fighting among students, the third ranked item with mean value of 3.91 was linked to carryout approved disciplinary actions when warranted, the fourth rank item was identify new tools and equipment needed with a mean value of 3.80, know school policies and procedure came fifth with an mean values of 3.70, device a filing system for instructional material and structure filing system for records and reports were ranked the least with equal mean value of 3.65. However, the overall average mean value 3.83 for these competencies with a corresponding rating of “above average importance” established the importance the



respondents attached to management role. This therefore means that the construct is generally viewed to be important by the respondents.

#### 4.2.8 Professional Role and Development Construct

Profession role and development construct included seven competencies; identify current trends of teaching profession, use research findings regarding effective teaching methods, promote attainment of goals of teaching profession, maintain ethical standards of a professional teacher, work with administrative personnel, communicate point of view of other instructors and keep pace with technological advancement in agriculture.

**Table 4.9: Perceived Importance for Professional role and development Construct**

(n = 66)

scale	1%	2%	3%	4%	5%	M	SD
Identify current trends of teaching profession	4.5	7.6	22.7	30.3	34.8	3.83	1.13
Use research findings regarding effective teaching methods	1.5	6.1	25.8	33.3	33.3	3.91	0.99
Promote attainment of goals of teaching profession	4.5	7.6	19.7	19.7	48.5	4.00	1.19



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Maintain the ethical standards of a professional teacher	7.6	4.5	16.7	34.8	36.4	3.88	1.18
Work with administrative personnel	4.5	4.5	10.6	29.4	40.9	4.08	1.06
Communicate point of view of other instructors	1.5	7.6	19.7	47.9	33.3	3.94	0.99
Keep pace with technological advancement in agriculture	9.1	9.1	22.7	27.3	31.8	3.64	1.27

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Scale: 1= No importance, 2 = below average importance, 3= Average importance, 4= above average importance, 5= Utmost importance (Cannon, 2012)

Table 4.9 above lists the seven competencies with their frequencies and percentages for each of the importance scale choices. work with administrative personnel ranked first with mean value of 4.08, second ranked item was promote attainment of goals of teaching profession with a mean value of 4.00, communicate point of view of other instructors placed third with mean value of 3.94, use research findings regarding effective teaching methods came fourth with mean value of 3.91, fifth ranked item was maintain the ethical



standards of a professional teacher with mean value of 3.88, identify current trends of teaching profession ranked sixth with mean value of 3.83 and the least rank was keep pace with technological advancement in agriculture with a mean value of 3.64. The overall average mean value of 3.9 for these competencies with a corresponding rating of “above average importance” recognized the importance the respondents attached to professional role and development. This therefore means that the construct is generally viewed to be relevant to the respondents as the competencies within the construct were rated “above average importance”

#### 4.2.9 Ranking of Competencies

##### 4.2.9.1 Highest Rank Competencies

**Table 4.10: Perceived Importance and Mean Scores for the top 15 Highest Ranked Competencies (n=66)**

No	Competencies	Importance	
		M	SD
1	Developing Students’ understanding through appropriate instructional strategies	4.15	0.899
2	Work with administrative personnel	4.08	1.057
3	Encourage students to exercise self-discipline	4.06	1.006
4	Planning and Implementing classroom procedure	4.05	1.029
5	Control outburst of fighting	4.02	1.116
6	Developed and Sequenced Instructional Materials	4.00	0.992
7	Promote attainment of goals of teaching profession	4.00	1.19



8	Using Instructional time Effectively	3.98	1.00
9	Interrelating ideas and information within and across subject matter areas	3.97	0.992
10	Solving problems that make subject matter meaningful	3.94	1.08
11	Communicate point of view of other instructors	3.94	0.99
12	Using Materials and technology to make subject matter accessible	3.91	1.034
13	Teaching using Experiments	3.91	1.034
14	Carryout approved disciplinary actions when warranted	3.91	1.212
15	Use research findings regarding effective teaching methods	3.91	0.988

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Table 4.10 shows the perceived importance and mean scores for the top 15 highest rank competencies. The results showed that of all the competencies, developing student's understanding through appropriate instructional strategies is rank the highest with an average mean value of 4.15 and is therefore the competence of topmost importance. This is followed by work with administrative personnel with mean value of 4.08, encourage students to exercise self-discipline with associated mean value of 4.06among others.





#### 4.2.9.2 Lowest Rank Competencies

**Table 4.11: Perceived Importance and Mean Scores for the Bottom 13 Lowest Ranked Competencies (n=66)**

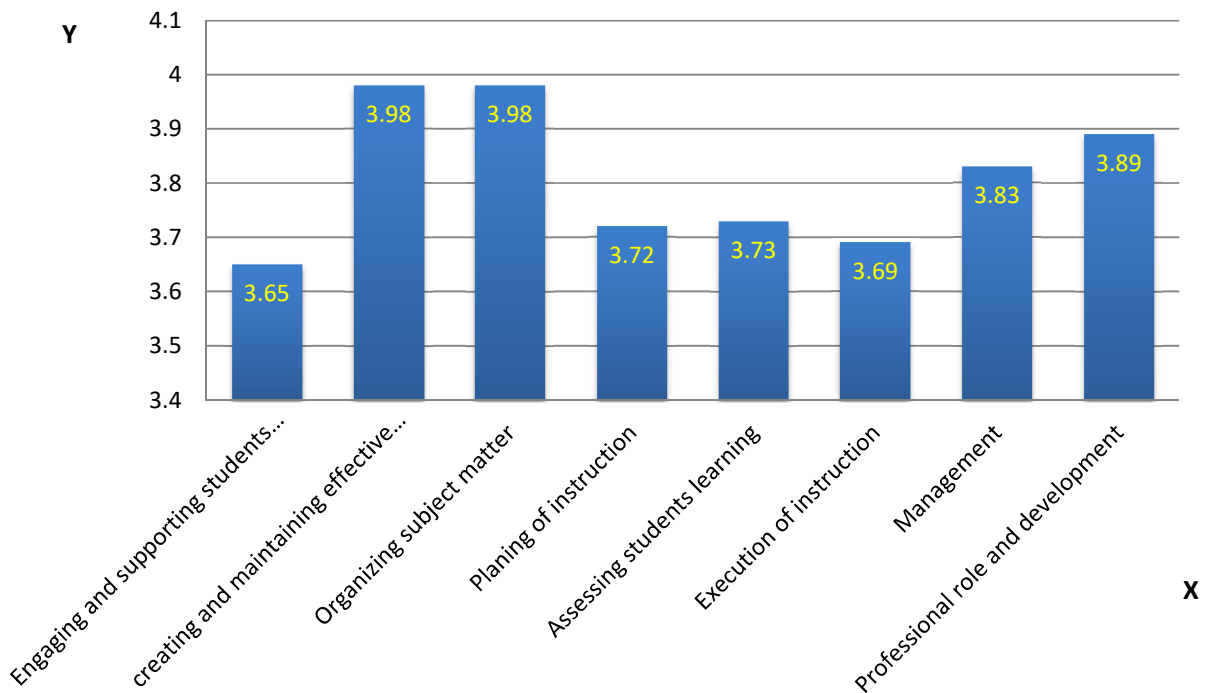
No	Competencies	Importance`	
		M	SD
38	Teaching agriculture relationship with the environment	3.67	1.086
39	Structure filing system for records and reports	3.65	1.157
40	Device filing system for instructional material	3.65	1.234
41	Communicating learning goals for students	3.64	1.285
42	Guiding students in assessing their learning	3.64	1.104
43	Keep pace with technological advancement in agriculture	3.64	1.273
44	Drawing on and valuing students' background	3.59	1.150
45	Determine students' needs and interest	3.58	1.229
46	Connecting students' prior knowledge with learning goals	3.55	1.279
47	Facilitating Learning experience that promote autonomy	3.42	1.190
48	Using multimedia equipment in teaching	3.38	1.345
49	Involved the student in planning	3.30	1.381
50	Using computers in class room teaching	3.23	1.401

Using computers in classroom teaching is rank the lowest competency possessing a mean value of 3.23 and therefore considered a competency which is not important compared to the other competencies. The reasons could be attributable to lack of computers by the



teachers to work with. It is also speculated that the respondents can do their work without computers or may lack the knowledge of using computers. This is followed by involves students in planning, using multimedia equipment in teaching with mean values of 3.30 and 3.38 among others respectively.

### Average Perceived Importance for Entire Construct



**Y = Average Mean Value of Constructs, X = Constructs**

**Figure 3: Average Perceived Importance for Entire Construct**

Figure 3 above shows that creating and maintaining effective environment and organizing subject matter construct with an overall equivalent mean value of 3.98 were rank as the topmost important constructs. Engaging and supporting students learning construct identified by an overall mean value of 3.65 was classified as the least important construct regarding the competencies as a whole. Figure 3 shows each of the eight construct in relation to one another with respect to average importance of the constructs as a whole.



### 4.3 Perceived Abilities of Agricultural Science Teachers

The teachers were asked to rank their level of ability regarding fifty identified agricultural pedagogical competencies in eight different constructs: engaging and supporting students learning, creating and maintaining effective environment, organizing subject matter, planning of instruction, assessing students learning, execution of instruction, management and professional role and development.

#### 4.3.1 Engaging and Supporting Students Learning construct

Engaging and supporting students learning construct composed of four competencies; connecting students' prior knowledge with learning goals, facilitating learning experience that promote autonomy, solving problems that make subject matter meaningful and self-directed reflective learning for students.

**Table 4.12: Perceived Ability for Engaging and supporting students learning**

Competence	1%	2%	3%	4%	5%	M	SD
Connecting students' prior knowledge with learning goals	18.2	16.7	19.7	33.3	12.1	3.05	1.39
Facilitating Learning Experience That Promote Autonomy	27.3	18.2	15.2	22.7	16.7	2.92	1.50
Solving Problems that make subject matter meaningful	27.3	13.6	13.2	21.2	19.7	3.08	1.41
Self-directed reflective learning for students	21.2	12.1	22.7	25.8	18.2	3.08	1.41



Scale: 1= No ability, 2 = below average ability, 3= Average ability, 4 = above average ability, 5 = Exceptional ability (Lester 2012)

Table 4.12 above lists the four competencies with the frequencies and percentages for each of the ability scale choices. Solving problems that make subject matter meaningful and self-directed reflective learning for students with a mean value of 3.08 were rank the highest perceived ability. Connecting students' prior knowledge with learning goals and facilitating learning experience that promotes autonomy rank third and fourth with mean values of 3.05 and 2.92 respectively as the competencies in which the respondents had the least ability. The overall average mean of 3.03 with an equivalent rating of "average ability" implies that the respondents are competent and have the ability to engage and support students learning that will set the moods of classroom activities and improve students' performance.

#### **4.3.2 Creating and Maintaining Effective Environment Construct**

Creating and maintaining effective environment construct is made up of five competencies; creating learning environment that engages students, establishing learning climate that promotes fairness, establishing and maintaining standards for students behavior, using instructional time effectively and planning and implementing classroom procedure as shown in table 4.13 below.



**Table 4.13: Perceived Ability for Creating and Maintaining Effective Environment**

Competence	1%	2%	3%	4%	5%	M	SD
Creating Learning Environment that Engages Students	16.7	18.2	27.3	16.7	21.2	3.08	1.37
Establishing Learning Climate that Promotes Fairness	27.3	7.6	18.2	34.8	12.1	2.97	1.43
Establishing and Maintaining Standards for Students Behavior	18.2	19.7	18.2	27.3	16.7	3.05	1.38
Using Instructional Time Effectively	24.2	12.1	15.2	19.7	28.8	3.17	1.57
Planning and Implementing Classroom Procedure	16.7	15.2	22.7	25.8	19.7	3.17	1.37

Scale: 1= No ability, 2 = below average ability, 3= Average ability, 4 = above average ability, 5 = Exceptional ability (Lester 2012)

The table 4.13 above lists the five competencies with their frequencies and percentages for each of the ability scale choices. Of the five competencies, using instructional time effectively and planning and implementing classroom procedure were rank first with a mean value of 3.17. Second rank item was linked to creating learning environment that engages students with mean value of 3.08. Third and the last rank competencies were establishing maintaining standards for students’ behavior and establishing learning climate that promotes fairness with associated mean values of 3.05 and 2.97 respectively. The overall average mean value of 3.09 of an equivalent rating of “average ability” indicates that the respondents have ability when creating and maintaining effective



environment in the classroom for smooth execution of instruction to enhance student's performance.

### 4.3.3 Organizing Subject Matter Construct

Organizing subject matter constructs composed of four competencies; demonstrate knowledge of subject matter, interrelating ideas and information within and across subject matter areas, developing students' understanding through appropriate instructional strategies, using materials and technology and to make subject matter accessible as shown in table 4.14 below

**Table 4.14: Perceived Ability for Organizing Subject Matter Construct (n = 66)**

Competence	1%	2%	3%	4%	5%	M	SD
Demonstrate knowledge of subject matter	21.2	9.1	25.8	19.7	24.2	3.17	1.45
Interrelating ideas and information within and across subject matter areas	18.2	12.1	10.6	39.4	19.7	3.30	1.40
Developing Students' understanding through appropriate instructional strategies	22.7	12.1	18.2	24.2	22.7	3.12	1.48
Using materials and technology to make subject matter accessible	19.7	16.7	22.7	27.3	13.6	2.98	1.34

Scale: 1= No ability, 2 = below average ability, 3= Average ability, 4 = above average ability, 5 = Exceptional ability (Lester 2012)



The table 4.13 above lists the four competencies with their frequencies and percentages for each of the ability scale choices. Interrelating ideas and information within and across subject matter areas with a mean value of 3.30 ranks highest and therefore considered a competency in which the respondents possessed high ability. The competency in which the respondents exhibited least ability is linked to using materials and technology to make subject matter accessible with mean value of 2.98. However the overall average mean value of 3.14 of an equivalent rating of “average ability” implies that the respondents are competent and were deeply concerned and mindful when organizing subject matter for agricultures lesson.

#### **4.3.4 Planning of Instruction Construct**

Planning of instruction construct contained ten competencies; drawing on and valuing students’ background, developing and sequencing instructional materials, involving students in planning, designing short and long term plan to foster learning, select method of evaluating student performance, determining students’ needs and interest, selecting teaching techniques for a lesson, plan introduction of a lesson, select tools and equipment for a lesson and plan summary of a lesson as shown in the table below:



**Table 4.15: Perceived Ability for planning of instruction (n=66)**

Competence	1%	2%	3%	4%	5%	M	SD
Drawing on and valuing students' background	19.7	12.1	21.2	30.3	16.7	3.12	1.38
Developing and sequencing instructional materials	13.6	15.2	22.7	33.3	15.2	3.21	1.27
Involving students in planning	16.7	24.2	24.2	21.2	13.6	2.91	1.30
Designing short and long term plan to foster learning	21.2	13.6	24.2	24.2	16.7	3.02	1.39
Select method of evaluating student performance	24.2	12.1	18.2	25.8	19.7	3.05	1.47
Determining students' needs and interest	19.7	13.6	22.7	34.8	9.1	3.00	1.29
Selecting teaching techniques for a lesson	25.8	10.6	25.8	18.2	19.7	2.95	1.462
Plan introduction of a lesson	21.2	15.2	19.7	21.2	22.7	3.09	1.47
Select tools and equipment for a lesson	21.2	7.6	16.7	30.3	24.2	3.29	1.47
Plan summary of a lesson	18.2	13.6	10.6	39.4	18.2	3.26	1.40

Scale: 1= No ability, 2 = below average ability, 3= Average ability, 4 = above average ability, 5 = Exceptional ability (Lester 2012).

Table 4.15above lists all the ten competencies for planning of instruction construct with the frequencies and percentages of each of the ability scale choices. Select tools and





equipment for a lesson ranks the topmost competence in which the teachers possessed the highest ability to perform their work with an associated mean value of 3.29. This was immediately followed by plan summary of a lesson as second rank item with a mean of 3.26, developing and sequencing instructional materials ranked third with mean of 3.21, drawing on and valuing students' background placed fourth with a mean value of 3.12, select method of evaluating student performance assumed the fifth position with mean of 3.05, this was followed by designing short and long term plan to foster learning in sixth ranked position with mean value of 3.02, determining students' needs and interest is seventh rank item with mean of 3.00, selecting teaching techniques for a lesson ranked eighth with mean value of 2.95, plan introduction of a lesson ranked ninth with a mean value of 3.09, the lowest mean value of 2.91 was related to involving students in planning with which the respondents showed less ability. However the overall average mean value of the entire competencies in these constructs was 3.09 with an equivalent rating of "average ability" denotes that the respondents are competent planners of instruction.

#### **4.3.5 Assessing Students Learning Construct**

Assessing students learning construct composed of four competencies; communicating learning goals for students, using multiple sources of information, guiding students in assessing their learning and using assessment results to guide instruction as shown in the table 4.16 below.



**Table 4.16: Perceived Ability for assessing students learning (n=66)**

Competence	1%	2%	3%	4%	5%	M	SD
Communicating Learning Goals for Students	18.2	13.6	16.7	33.3	18.2	3.2	1.38
Using multiple sources of information	13.6	9.1	24.2	30.3	22.7	3.39	1.31
Guiding Students in Assessing their Learning	19.7	13.6	12.1	33.3	21.2	3.23	1.44
Using Assessment Results to Guide Instruction	19.7	10.6	13.6	34.8	21.2	3.27	1.43

Scale: 1 = No ability, 2 = below average ability, 3 = Average ability, 4 = above average ability, 5 = Utmost ability (Lester 2012)

The Table 4.16 lists the four competencies and their frequencies and percentages for each of the ability scale choices. Using multiple sources of information ranked first with mean value of 3.39. The second rank item is connected to using assessment results to guide instruction with a mean value of 3.27. The third rank item is linked to guiding students in assessing their learning with mean value of 3.23. The last item in rank is related to communicating learning goals for students. The overall average mean value of 3.27 with



an equivalent rating of “average ability” implies that the respondents can competently assess their students learning.

#### 4.3.6 Execution of Instruction Construct

Execution of instruction construct is made up of ten competencies; using computers in classroom teaching, using multimedia equipment in teaching, teaching record keeping skills, teaching public issues regarding agriculture, teaching agriculture knowledge and skills, motivation students to learn, teaching using experiments, teaching students problems solving skills, teaching agriculture relationship with the environment and planning and conducting field trips as shown in the table 4.17 below.

**Table 4.17: Perceived ability for execution of instruction (n = 66)**

Competence	1%	2%	3%	4%	5%	M	SD
Using Computers In Classroom Teaching	30.3	16.7	19.7	19.7	13.6	2.70	1.39
Using multimedia equipment in teaching	25.8	10.6	30.3	18.2	15.2	3.18	1.32
Teaching Record Keeping Skills	18.2	9.1	24.2	33.3	15.2	3.18	1.32
Teaching public issues regarding agriculture	19.7	13.6	24.2	22.7	19.7	3.09	1.40
Teaching agriculture knowledge and skills	15.2	9.1	23.3	30.3	12.1	3.15	1.22
Motivation students to learn	24.2	9.1	22.7	28.8	15.2	3.02	1.41
Teaching using Experiments	19.7	18.2	16.7	21.2	24.2	3.12	1.47



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Teaching students problems solving skills	19.7	10.6	24.2	27.3	18.2	3.14	1.38
Teaching agriculture relationship with the environment	21.2	13.6	22.7	25.8	16.7	3.03	1.39
Planning and conducting field trips	24.2	13.6	22.7	22.7	16.7	2.94	1.42

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Scale: 1 = No ability, 2 = below average ability, 3 = Average ability, 4 = above average ability, 5 = Utmost ability (Lester 2012)

Table 4.17 above lists the ten competencies with their frequencies and percentages for each of the ability scale choices. the topmost rank competencies in this category is connected to using multimedia equipment in teaching and that of teaching record keeping skills with equal mean values of 3.18 indicating an “average ability”. The bottom rank item with mean value of 2.70 representing “average ability” rating is related to using computers n classroom teaching. However, the overall average mean value of 2.75 with an equivalent rating of “average ability” implies that the respondents execute their instructions with some difficulties.

#### 4.3.7 Management Construct

Management construct consisted of seven competencies; know school policies and procedure, identifying tools and equipment needed, structure filing system for records and reports, device a filing system for instructional material, carryout approved disciplinary actions when warranted, encourage students to exercise self-discipline and control outburst of fighting as shown in the table 4.18 below



**Table 4.18: Perceived ability for Management (n = 66)**

Competence	1%	2%	3%	4%	5%	M	SD
Know school policies and procedure	22.7	9.1	22.7	21.2	24.2	3.14	1.48
Identifying tools and equipment needed	13.2	12.1	27.3	19.7	22.7	3.17	1.40
Structure filing system for records and reports	19.7	10.6	28.8	19.7	21.2	3.12	1.40
Device a filing system for instructional material	18.2	18.2	25.8	19.7	18.2	3.02	1.36
Carryout approved disciplinary actions when warranted	16.7	10.6	27.3	21.2	24.2	3.26	1.39
Encourage students to exercise self-discipline	18.2	10.6	16.7	27.3	27.3	3.35	1.45
Control outburst of fighting	18.2	18.2	10.6	24.2	28.8	3.27	1.50

Scale: 1 = No ability, 2 = Below average ability, 3 = Average ability, 4 = Above average ability, 5 = Utmost ability

Table 4.18 above lists seven competencies and their corresponding frequencies and percentages for each of the ability scale choices. the first ranked item was linked to encourage students to exercise self-discipline with a mean value of 3.35, control outburst of fighting with mean value of 3.27 ranked as second item, third rank item were associated with carryout approved disciplinary actions when warranted with a mean value



of 3.26, identifying tools and equipment needed placed fourth with a mean value of 3.17, fifth ranked competency was known school policies and procedure with mean of 3.14, sixth and least rank items were structure filing system for records and reports with mean value of 3.12 and device a filing system for instructional material with mean of 3.02 respectively. However, the overall mean value of 3.19 with an equivalent rating of “average ability” implies that the respondents are competent managers of the program.

#### 4.3.8 Professional Role and Development

Professional role and development is made up of seven competencies; identify current trends of the teaching profession, use research findings regarding effective teaching methods, promote attainment of goals of teaching profession, maintain ethical standards of a professional teacher, work with administrative personnel, communicate point of view of other instructors and keep pace with technological advancement in agriculture as shown in table 4.19

**Table 4.19: Perceived ability for professional role and development (n = 66)**

Competence	1%	2%	3%	4%	5%	M	SD
Identify current trends of the teaching profession	31.8	10.6	15.2	21.2	21.2	2.89	1.57
Use research findings regarding effective teaching methods	28.8	10.6	19.7	22.7	18.2	2.91	1.496
Promote attainment of goals of teaching profession	24.2	15.2	19.7	16.7	24.2	3.02	1.514



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Maintain ethical standards of a professional teacher	30.3	7.6	12.1	27.3	22.7	3.05	1.583
Work with administrative personnel	28.8	7.6	13.6	30.3	19.7	3.05	1.534
Communicate point of view of other instructors	16.7	19.7	12.1	28.8	22.7	3.21	1.431
Keep pace with technological advancement in agriculture	28.8	19.7	13.6	21.2	16.7	2.77	1.486

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Scale: 1 = No ability, 2 = below average ability, 3 = Average ability, 4 = above average ability, 5 = Utmost ability

Table 4.18 lists above the seven competencies with their frequencies and percentages for each of the ability scale choices. The highest rank competency with (mean=3.21; SD=1.43) is linked to communicating point of view of other instructors, Maintain ethical standards of a professional teacher( mean=3.05; SD=1.53) rank second, third rank item is related to Work with administrative personnel( mean=3.05; SD=1.58), Promote attainment of goals of teaching profession(mean=3.02; SD=1.51) placed fourth, Use research findings regarding effective teaching methods( Mean=2.91; SD=1.50) assumed sixth position, Identify current trends of the teaching profession (mean=2.89; SD=1.57), and Keep pace with technological advancement in agriculture(Mean=2.77; SD= 1.49) ranked seventh and eighth position respectively. However, the overall average mean value of 2.99 with an equivalent rating of approximately average ability indicated that the



respondents are somewhat competent when it comes to their professional role and development

#### 4.3.9 Ranking of ability competencies

##### 4.3.9.1 Top Rank Ability Competencies

**Table 4. 20: Perceived Ability and Mean Scores for the Top Twelve (12) Highest Rank Competencies (N=66)**

No	Competencies	Ability	
		M	SD
1	Using multiple sources of information	3.39	1.311
2	Encourage students to exercise self-discipline	3.35	1.452
3	Interrelating ideas and information within and across subject matter areas	3.3	1.403
4	Select tools and equipment for a lesson	3.29	1.465
5	Using assessment results to guide instruction	3.27	1.431
6	Control outburst of fighting	3.27	1.504
7	Plan summary of a lesson	3.26	1.396
8	Carryout approved disciplinary actions when warranted	3.26	1.385
9	Guiding students in assessing their learning	3.23	1.444
10	Developing and Sequencing Instructional Materials	3.21	1.271
11	Communicate point of view of other instructors	3.21	1.431
12	Communicating learning goals to students	3.2	1.384





Table 4.20 above lists the twelve competencies with the highest ability rating. The respondents rank using multiple sources of information with mean value of 3.39, followed by encourage students to exercise self-discipline with an average mean value of 3.35 among others as the competencies, in which they had the highest perceived ability.

#### 4.3.9.2 Lowest Rank Ability Competencies

**Table 4.21: Perceived Ability and Mean Scores for the Bottom Ten (10) Lowest Rank Competencies (n=66)**

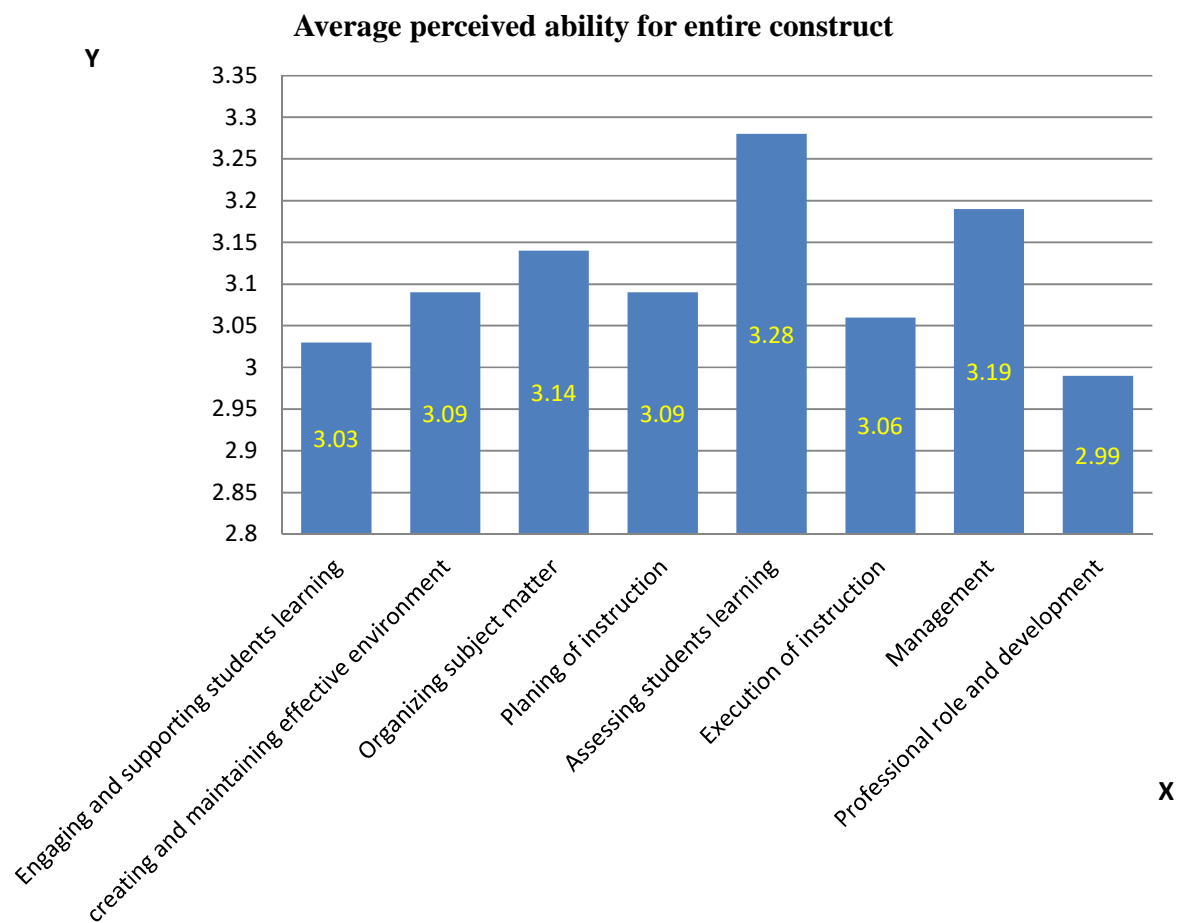
No	Competencies	Ability	
		M	SD
41	Using Materials and technology to make subject matter accessible	2.98	1.34
42	Establishing learning climate that promotes fairness	2.97	1.43
43	Select Teaching techniques for a lesson	2.95	1.46
44	Planning and conducting field trips	2.94	1.42
45	Facilitating Learning experience that promote autonomy	2.92	1.50
46	Involving students in planning	2.91	1.30
47	Use research findings regarding effective teaching methods	2.91	1.50
48	Identify current trends of teaching profession	2.89	1.57
49	Keep pace with technological advancement in agriculture	2.77	1.49
50	Using computers in classroom teaching	2.7	1.39



Table 4.21 above lists the competencies for the ten bottom lowest ability ratings.

On the other hand, using computers in classroom teaching with corresponding mean value of 2.70, followed by keeping pace with technological advancement in agriculture with associated mean value of 2.77 among others were rank as the competencies in which they had the lowest perceived ability.

#### 4.3.10 Comparing Ability Constructs.



Y = Average Mean Value of Constructs, X = Constructs

Figure 5: Illustrates Average Perceive Ability for Entire Construct



In figure 5 above, Assessing Students Learning construct with a mean value of 3.28 was ranked as having the highest perceived ability regarding the competencies. Professional role and development construct with an overall mean of 2.99 was classified as having the lowest perceived ability regarding the competencies as a whole. Figure 5 above shows each of the eight (8) constructs in relation to one another with respect to average perceived ability of the competencies within each construct.

#### 4.4 Pedagogical Training Needs of Agricultural Science Teachers

##### 4.4.1 Engaging and Supporting Students Learning Construct

**Table 4.22: Importance, Ability and Mean Weighted Discrepancy Scores for Engaging and Supporting Students Learning construct (n=66)**

Competencies	Importance <sup>α</sup>		Ability <sup>β</sup>		MWDS <sup>γ</sup>
	M	SD	M	SD	
Connecting students' prior knowledge with learning goals	3.55	1.28	3.05	1.32	1.77
Facilitating Learning experience that promote autonomy	3.42	1.19	2.83	1.47	3.89
solving problems that make subject matter meaningful	3.94	1.08	2.92	1.50	3.99
Self-directed reflective learning for students	3.70	1.14	3.80	1.41	2.30



The table 4.22 lists out the means and standard deviations for importance, ability ratings and Mean Weighted Discrepancy Score for each of the construct's competencies.

The MWDS scores indicate that there is a higher need (MWDS=3.99) for training of teachers in solving problems that make subject matter meaningful. Whilst they perceived it to be above average importance (Mean=3.94), their ability was average (mean=2.92). The second higher need for training was facilitating learning experience that promote autonomy (MWDS=3.89). Similarly whilst this competency was perceived to be average importance (Mean=3.42; SD=1.19). They perceive it to be average ability (Mean=2.83; SD=1.47). The training need for connecting students prior knowledge with learning was low (MWSDS=1.77). Whilst teachers perceived this competency to be above average important (mean=3.55; SD=1.28). They possess average ability (mean=3.05; SD=1.32). This means that respondents placed so much importance on solving problems that makes subject matter meaningful but lack the ability to execute it. Therefore, in terms of engaging and supporting students' learning, respondents require competency training in solving problems that makes subject matter meaningful. On the other hand, they require less training in how to connect students' prior knowledge to learning outcomes. In selecting a competency area for training under this construct, priority should be given to solving problems that makes subject matter meaningful compared to the other competencies



**4.4.2 Creating and Maintaining Effective Environment construct,**

**Table 4.23: Importance, Ability and Mean Weighted Discrepancy Score for Creating and Maintaining Effective Environment construct (n=66)**

	<i>Importance<sup>α</sup></i>		<i>Ability<sup>β</sup></i>		<i>MWDS<sup>γ</sup></i>
	M	SD	M	SD	
Competencies					
Creating learning Environment that engages students	3.80	1.24	3.08	1.37	2.77
Establishing learning climate that promotes fairness	3.86	1.06	2.97	1.43	3.45
Establishing and Maintaining Standards for Students behaviors	3.86	0.99	3.05	1.38	3.16
Using Instructional time Effectively	3.98	1.00	3.17	1.57	3.26
Planning and Implementing classroom procedure	4.05	1.03	3.17	1.37	3.56

Table 4.23 lists out the means and standard deviations for both importance and ability ratings for each of the construct’s competencies. The MWDS scores indicate that there is a higher need (MWDS=3.56) for training of teachers in Planning and implementing classroom procedure. Whilst they perceived it to be above average importance



(Mean=4.05), their ability was average (mean=3.17). The next higher need for training was associated with Establishing learning climate that promotes fairness (MWDS=3.45). Similarly, as this competency is perceived to be above average importance (mean=3.86), their ability was average (mean=2.97). The third highest need for training was linked to Using Instructional time Effectively with MWDS of 3.26. While teachers perceived this competency to be above average importance (mean=3.98) their ability however, was average (mean=3.17). Training need for Creating learning Environment that engages students was low (MWDS=2.77). Whereas this competency was perceived to be above average importance (mean=3.80) by the teachers, their ability was however, average (mean=3.08). This means that respondents attached so much importance on planning and implementing classroom procedure but has no ability to perform it. Consequently, in terms of creating and maintaining effective environment, respondents require competence training on planning and implementing classroom procedure. On the other hand, they require less training on creating learning environment that engages students. In selecting a competence area for training under this construct, precedence should be given to planning and implementing classroom procedure compared to the other competencies as a whole.



#### 4.4.3 Organizing Subject Matter construct

**Table 4.24: Importance, Ability and Mean Weighted Discrepancy Score for Organizing Subject Matter construct (n=66)**

Competencies	<i>Importance</i> <sup>α</sup>		<i>Ability</i> <sup>β</sup>		<i>MWDS</i> <sup>γ</sup>
	M	SD	M	SD	
Demonstrate knowledge of subject matter	3.89	1.27	3.17	1.45	2.83
Interrelating ideas and information within and across subject matter areas	3.97	0.99	3.8	1.40	2.65
Developing Students' understanding through appropriate instructional strategies	4.15	1.00	3.12	1.48	4.28
Using Materials and technology to make subject matter accessible	3.91	1.03	2.98	1.34	3.61

Table 4.24 lists out the means and standard deviations for importance and ability ratings and MWDS for each of the construct's competencies. Developing students understanding through appropriate instructional strategies possess a highest MWDS of 4.28 and is therefore the competency with the largest need of training in. whereas this competency was perceived to at above average importance (mean=4.15), teachers ability was average(mean=4.15). Using Materials and technology to make subject matter accessible



was the second competency in need of training in with the MWDS of 3.61. While the competence was perceived to be above average importance (mean=3.91; SD=1.03), their ability was perceived to be average (Mean=2.98; SD=1.34) The competency with the lowest MWDS of 2.65 was linked to interrelating ideas and information within and across subject matter areas. This implies that respondents placed so much importance on developing students understanding through appropriate instructional strategies but however showed deficiencies in terms of ability to affect same. Thus, in terms of organizing subject matter, respondents require training on developing students understanding through appropriate instructional strategies. On the other hand, they require less training on how to Interrelating Ideas and Information Within and Across Subject Matter Areas. In considering a competency area for training under this construct, urgency should be given to Developing Students Understanding through Appropriate Instructional Strategies compared to the other competencies.

#### 4.4.4 Planning of Instruction Construct

**Table 4.25: Importance, Ability and Mean Weighted Discrepancy Score for Planning of Instruction construct (n=66)**

Competencies	<i>Importance<sup>α</sup></i>		<i>Ability<sup>β</sup></i>		<i>MWDS<sup>γ</sup></i>
	M	SD	M	SD	
Drawing on and valuing students' background	3.59	1.15	3.12	1.38	1.69
Developing and Sequencing	4.00	0.99	3.21	1.27	3.15





Instructional Materials

Involved student in planning	3.30	1.38	2.91	1.30	1.30
Designing short and long term plan to foster learning	3.70	1.23	3.02	1.39	2.52
Select method of evaluating student performance	3.70	1.25	3.05	1.47	2.41
Determine students' needs and interest	3.58	1.23	3.00	1.29	2.06
Select Teaching techniques for a lesson	3.79	1.18	2.95	1.46	3.16
Plan introduction of a lesson	3.56	1.12	3.09	1.47	2.99
Select tools and equipment for a lesson	3.89	1.10	3.29	1.47	2.36
Plan summary of a lesson	3.82	1.04	3.26	1.40	2.14

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Table 4.25 lists out the means and standard deviations for the importance and ability rankings and MWDS for each of the construct's competencies. The highest MWDS of 3.16 is connected to selecting teaching techniques for a lesson. Involving students in planning a unit received the lowest MWDS of 1.30. This indicates that respondents put so much importance on selecting teaching techniques for a lesson but lack the ability to accomplish it. Therefore, in terms of planning of instruction, respondents have need of competence training on selecting teaching techniques for a lesson. On the other hand, they require less training on how to involving students in planning a unit. In selecting a competence area for training under this construct, priority should be given to selecting teaching techniques for a lesson.

#### 4.4.5 Assessing Students Learning Construct

**Table 4.26: Importance, Ability and Mean Weighted Discrepancy Score for Assessing Students Learning construct (n=66)**

Competencies	<i>Importance<sup>α</sup></i>		<i>Ability<sup>β</sup></i>		<i>MWDS<sup>γ</sup></i>
	M	SD	M	SD	
Communicating learning goals for students	3.64	1.29	3.20	1.38	1.59
Using multiple sources of information	3.83	0.99	3.39	1.31	1.68
Guiding students in assessing their learning	3.64	1.10	3.23	1.44	1.49
Using assessment results to guide instruction	3.80	1.17	3.27	1.43	2.01



Table 4.26 lists out the means and standard deviations for the Importance and Ability ratings and the Mean Weighted Discrepancy Score for each of the construct's competencies. Using Assessment results to Guide Instruction had the highest MWDS of 2.01. Guiding students in assessing their learning was classified as having the lowest MWDS of 1.49. This means that respondents retained ample importance on using assessment results to guide instruction but lack the ability to achieve it. Therefore, in terms of assessing students learning, respondents require competency training on using assessment results to guide instruction. In one breath, they require fewer training on how to guiding students in assessing their learning. In picking a competency area for training under this construct, priority should be given to using assessment results to guide instruction compared to the other competencies.

#### 4.4.6 Execution of Instruction Construct

**Table 4.27: Importance, Ability and Mean Weighted Discrepancy Score for Execution of Instruction (n=66)**

Competencies	Importance <sup>α</sup>		Ability <sup>β</sup>		MWDS <sup>γ</sup>
	M	SD	M	SD	
Using computers in classroom teaching	3.23	1.40	2.70	1.44	1.71
Using multimedia equipment in teaching	3.38	1.35	2.86	1.39	1.74
Teaching record keeping skills	3.70	1.04	3.18	1.32	1.90



Teaching about public issues regarding agriculture	3.71	1.26	3.09	1.40	2.31
Teaching agriculture knowledge and skills	3.85	1.07	3.15	1.22	0.00
Motivation students to learn	3.86	1.16	3.02	0.41	3.28
Teaching using Experiments	3.91	1.03	3.12	1.47	3.08
Teaching students problems solving skills	3.73	1.17	3.14	1.38	2.20
Teaching agriculture relationship with the environment	3.67	1.09	3.03	1.39	2.33
Planning and conducting field trips	3.85	1.09	2.94	1.42	3.49

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Table 4.27 lists out the means and standard deviations for the importance and ability rankings a mean weighted discrepancy score for each of the construct's competencies. The highest MWDS of 3.49 was connected to planning and conducting field trips. The competency with the lowest MWDS for the construct was related to teaching agriculture knowledge and skills with a MWDS of 0.00. This means that respondents placed so much importance on planning and conducting field trips but lack the ability to execute it. Therefore, in terms of execution of instruction construct, respondents require competence

training on planning and conducting field trips solving problems that makes subject matter meaningful. On the other hand, they require less training on how to teaching agriculture knowledge and skills connect students' prior knowledge to learning outcomes. In picking a competency area for training under this construct, priority should be given to planning and conducting field trips compared to the other competencies.

#### 4.4.7 Management construct (n=66)

**Table 4.28 Importance, Ability and Mean Weighted Discrepancy Score for Management construct (n=66)**

Competencies	Importance <sup>α</sup>		Ability <sup>β</sup>		MWDS <sup>γ</sup>
	M	SD	M	SD	
Know school policies and procedure	3.70	1.32	3.15	1.48	2.02
Identify tools and equipment needed	3.80	1.11	3.17	1.40	2.42
Structure filing system for records and reports	3.65	1.16	3.12	1.40	1.93
Device a filing system for instructional material	3.65	1.23	3.02	1.36	2.32
Carryout approved disciplinary actions when warranted	3.91	1.21	3.26	1.39	2.55
Encourage students to exercise self-discipline	4.06	1.10	3.35	1.45	2.89
Control outburst of fighting	4.02	1.12	3.27	1.50	0.00



Table 4.28 lists out the means and standard deviations for the importance and ability rankings and the MWDS for each of the construct's competencies. The competency with the highest MWDS of 2.89 was linked to encourage students to exercise self-discipline and that of the lowest MWDS of 0.00 was associated with control outburst of fighting. This means that respondents placed so much importance on encourage students to exercise self-discipline but lack the ability to execute it. Therefore, in terms of management, respondents require competency training in encourage students to exercise self-discipline. On the other hand, they require less training on how to control outburst of fighting connect students' prior knowledge to learning outcomes. In picking a competency area for training under this construct, priority should be given to encourage students to exercise self-discipline compared to the other competencies.

#### 4.4.8 Professional Role and Development

**Table 4.29 Importance, Ability and Mean Weighted Discrepancy Score for Professional Role and Development (n=66)**

Competencies	Importance <sup>α</sup>		Ability <sup>β</sup>		MWDS <sup>γ</sup>
	M	SD	M	SD	
Identify current trends of the teaching profession	3.83	1.13	2.89	1.57	3.60
Use research findings regarding the effectiveness of teaching methods	3.91	0.99	2.91	1.50	3.91
Promote attainment of goals of teaching profession	4.00	1.19	3.02	1.51	3.94



Maintain ethical standards of a professional teacher	3.88	1.18	3.05	1.58	3.23
Work with administrative personnel	4.08	1.06	3.05	1.33	4.19
Communicate point of view of other instructors	3.94	0.99	3.21	1.43	2.87
Keep pace with technological advancement in agriculture	3.64	1.27	2.77	1.49	3.14

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Table 4.29 lists out the means and standard deviations for the importance and ability ratings and the mean weighted discrepancy score for each of the construct's competencies. The highest MWDS of 4.19 and that of the lowest MWDS of 2.87 were associated with work with administrative personnel and communicate point of view of other instructors respectively. This means that respondents placed so much importance on administrative personnel but lack the ability to execute it. Therefore, in terms of professional role and development, respondents require competency training in working with administrative personnel. On the other hand, they require less training in how to communicating point of view of other instructors. In picking a competency area for training under this construct, priority should be given to administrative personnel when compared with other competencies.



#### 4.4.9 Ranking of Competencies based on MWDS

##### 4.4.9.1 Highest rank competencies based on MWDS

**Table 4.30: Importance, Ability and Mean Weighted Discrepancy Scores for the Nineteen (19) Highest Rank Competencies (n=66)**

Rank	Competencies	<i>Importance<sup>α</sup></i>		<i>Ablity<sup>β</sup></i>		<i>MWDS<sup>γ</sup></i>
		M	SD	M	SD	
1	Developing students' understanding through appropriate instructional strategies	4.15	0.89	3.12	1.48	4.28
2	Work with administrative personnel	4.08	1.06	3.05	1.33	4.19
3	solving problems that make subject matter meaningful	3.94	1.08	2.92	1.50	3.99
4	Promote attainment of goals of teaching profession	4.00	1.19	3.02	1.51	3.94
5	Use research findings regarding the effectiveness of teaching methods	3.91	0.99	2.91	1.50	3.91
6	Facilitating Learning experience that promote autonomy	3.42	1.19	2.83	1.47	3.89
7	Using Materials and technology to make subject matter accessible	3.91	1.03	2.98	1.34	3.61







8	Identify current trends of the teaching profession	3.83	1.13	2.89	1.57	3.6
9	Planning, implementing classroom procedure	4.05	1.03	3.17	1.37	3.56
10	Planning, conducting field trips	3.85	1.09	2.94	1.42	3.49
11	Establishing learning climate that promotes fairness	3.86	1.06	2.97	1.43	3.45
12	Motivation students to learn	3.86	1.80	3.02	0.41	3.28
13	Using instructional time effectively	3.98	1.00	3.17	1.57	3.26
14	maintain ethical standards of a professional teacher	3.88	1.18	3.05	1.58	3.23
15	Establishing and maintaining standards for students behaviors	3.86	0.99	3.05	1.36	3.16
16	Select teaching techniques for a lesson	3.79	1.18	2.95	1.46	3.16
17	Developing, sequencing instructional materials	4.00	0.99	3.21	1.27	3.15
18	Keep pace with technological advancement in agriculture	3.64	1.27	2.77	1.49	3.14
19	Teaching using experiments	3.91	1.03	3.12	1.47	3.08

Table 4.30 lists the nineteen highest ranked competencies out of fifty competencies. The competency with the highest mean weighted discrepancy score overall was developing students understanding through appropriate instructional strategies from organizing

subject matter construct with a MWDS of 4.28 indicating the largest need for professional development. This means that, overall; training on this competence is much needed when compared to the other competencies. This is followed by work with administrative personnel with a MWDS 4.19 among others.

#### 4.4.9.2 Lowest rank competencies based on MWDS

**Table 4.31: Importance, Ability and Mean Weighted Discrepancy for the Eleven Lowest Rank Competencies (n=66) Weighted Discrepancy Score based on Mean**

No	Competencies	<i>Importance<sup>α</sup></i>		<i>Ability<sup>β</sup></i>		<i>MWDS<sup>γ</sup></i>
		M	SD	M	SD	
40	Teaching record keeping skills	3.7	1.04	3.18	1.32	1.9
41	Connecting students' prior knowledge with learning goals	3.55	1.28	3.05	1.33	1.77
42	Using multimedia equipment in teaching	3.38	1.345	2.86	1.39	1.74
43	Using computers in classroom teaching	3.23	1.40	2.7	1.44	1.71
44	Drawing on and valuing students' background	3.59	1.15	3.12	1.38	1.69
45	Using multiple sources of information	3.83	0.99	3.39	1.31	1.68
46	Communicating learning goals for students	3.64	1.29	3.2	1.38	1.59
47	Guiding students in assessing their	3.64	1.10	3.23	1.44	1.49

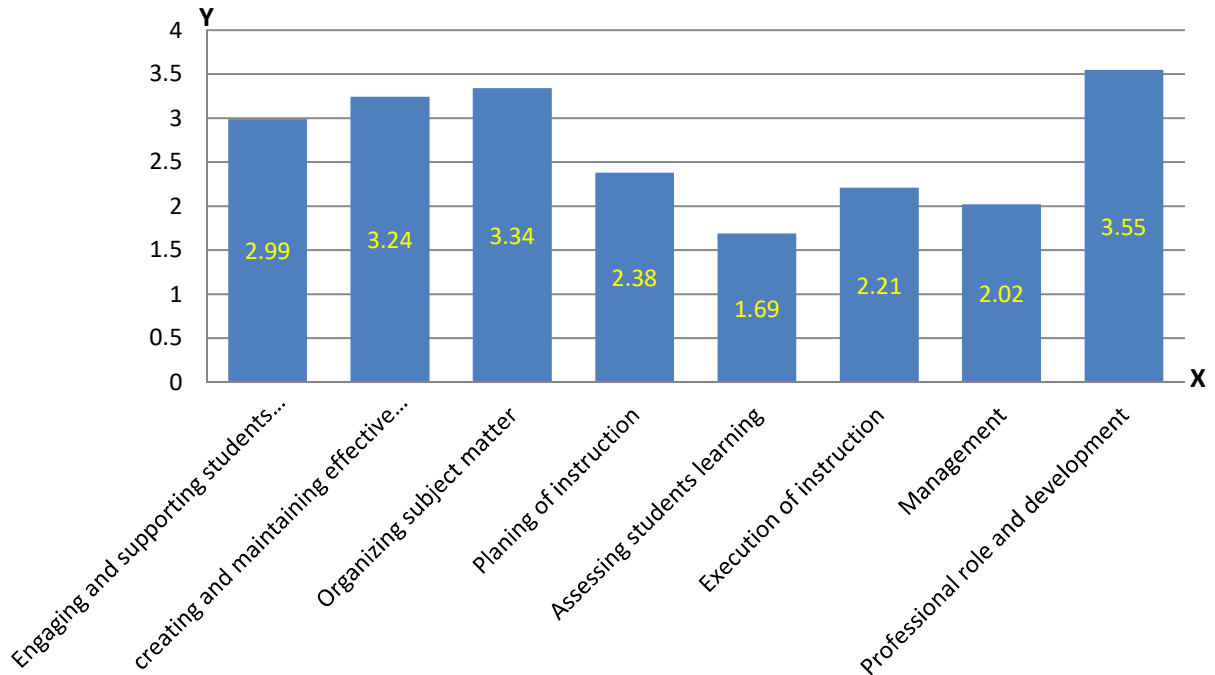


	learning					
48	Involving student in planning	3.3	1.38	2.91	1.30	1.3
49	Teaching agriculture knowledge and skills	3.85	1.07	3.15	1.29	0.00
50	Control outburst of fighting	4.02	1.12	3.27	1.50	0.00

Table 4.31 lists the eleven lowest ranking competencies out of the fifty total competencies.

On the other hand, the competency with the lowest MWDS overall was linked to control outburst of fighting from management construct, with a MWDS of 0.00, indicating the least need for professional development compared to the other competencies.

**Average Mean Weighted Discrepancy Scores for Entire Construct**



**Y = Average Mean Weighted Discrepancy score, X = Constructs**

**Figure7: Illustrates Average Mean Weighted Discrepancy Scores for Entire Construct**



Figure 7 shows each of the eight constructs in relation to others with respect to average MWDS within each construct. Professional role and development construct, with an average MWDS of 3.55, was ranked as having the highest need for professional development regarding the competencies within the constructs. Assessing students learning construct, with 1.69 average MWDS was categorized as having the least need for professional development. This means that respondents require more training on their professional role and development but require less training on assessing students' learning outcomes.

Overall professional development needs were analyzed and ranked using Mean Weighted Discrepancy Score (MWDS) as shown in appendix (E). The top nineteen competencies out of fifty in need of training by agriculture teachers included: Developing students' understanding through appropriate instructional strategies with MWDS of 4.28. work with administrative personnel with MWDS of 4.19; solving problems that make subject matter meaningful with MWDS of 3.99. promote attainment of goals of teaching profession with a MWDS of 3.94; using research findings regarding the effectiveness of teaching methods with MWDS of 3.91. facilitating learning experience that promote autonomy with a MWDS of 3.89; using materials and technology to make subject matter accessible with a MWDS of 3.61; identify current trends of the teaching profession with a MWDS 3.6; planning and implementing classroom procedure with a MWDS 3.56; planning and conducting field trips with a MWDS 3.49; establishing learning climate that promotes fairness (3.45); motivation students to learn 3.28; using instructional time effectively with a MWDS 3.26; maintain ethical standards of a professional teacher with a MWDS (3.23; establishing and maintaining standards for students behaviors with a MWDS 3.16; select



teaching techniques for a lesson with a MWDS 3.16; developing and sequencing instructional materials with a MWDS 3.15; keeping pace with technological advancement in agriculture with a MWDS 3.14 and teaching using experiments with a MWDS 3.08.

#### 4.5 Methods of Professional Development Preference by Agricultural Science

##### Teachers

The teachers were asked to rate their preference in eight different professional development opportunity areas: in-house training, short course, specific training, seminars, workshops, apprenticeship, conferences and further studies.

**Table 4.32: Professional Development Opportunities Preference by Agricultural Science Teachers (66)**

Methods	1%	2%	3%	4%	5%	M	SD
In house training	22.7	18.2	24.2	21.2	13.6	2.85	1.36
Short course	15.2	9.1	21.2	30.3	24.2	3.39	1.36
Specific training	19.7	7.6	9.1	30.3	33.3	3.50	1.51
Further studies	6.1	6.1	13.6	27.3	47.0	4.03	1.19
Seminars	12.1	9.1	15.2	36.4	27.3	3.58	1.31
Workshops	7.6	7.6	18.2	39.4	27.3	3.71	1.17
Apprenticeship	24.2	9.1	22.7	28.8	15.2	3.02	1.41
Conferences	34.8	28.8	16.7	19.7	0.00	2.86	1.54



Scale: 1 = Not preferred, 2 = Less Preferred, 3 = More Preferred, 4 = Most Preferred, 5 = Highly Preferred

Table 4.32 lists all the eight professional development opportunities with their frequencies and percentages for each of the preference scale choices. Sixteen out of sixty-six respondents representing (24.2%) rated In House Training to be “more preferred”. About one-third of the respondents representing (34.8%) identified Conferences to be “more preferred”. At least one-third of the respondents ranked short courses (30.3%), specific training (33.3%), seminars (36.4%), workshops (39.4%) and apprenticeship (28.8%) to be “most preferred” professional development opportunities. Almost half of the respondent representing (47.0%) valued further studies at “highly preferred” professional development opportunity.

#### 4.6 Ranking of Professional Opportunity Preference

**Table 4.33: Ranking of the Professional Development Opportunities in order of preference by the Agriculture Teachers**

<b>Professional Development Opportunities</b>	<b>M</b>	<b>SD</b>
Further Studies	4.03	1.189
Workshops	3.71	1.174
Seminars	3.58	1.313
Specific training	3.5	1.511
Short course	3.39	1.357
Apprenticeship	3.02	1.409

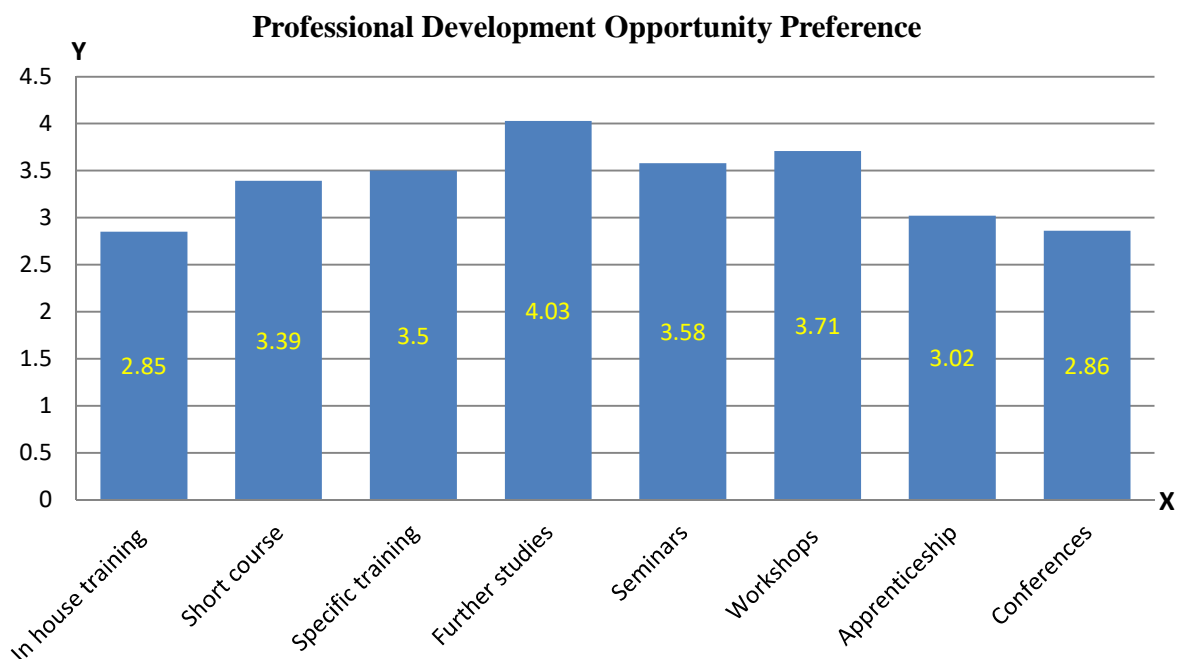


Conferences	2.86	1.538
In house training	2.85	1.361

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Table 4.33 lists out all the professional development opportunities in order of preference as reported by the respondents. The teachers ranked further studies (M=4.03) at “highly preferred” as the highest preferred professional development opportunity and In house training (M=2.85) at “Not preferred” as the lowest preferred professional development opportunity. This means that for training to yield good and better results, priority should be given to further studies followed by workshops and seminars among others as method through which respondents can improve their knowledge and skills in terms of professional development. On the other hand, less attention may be given to In house training when compared to others.





**Y= Mean Value for Professional Development Methods, X = Methods**

**Figure: 8: Above Illustrates Professional Development Opportunity Preference as reported by the respondents**

Overall, priority should be given to further studies, workshops, seminars and specific training when providing professional development training to the teachers.





## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Chapter presents the summary, conclusion, recommendations and suggestions of the study.

#### 5.1 Summary

The purpose of this study was to assess the pedagogical competency needs of agricultural science teachers in Senior High Schools in Tamale metropolis, examining their perceived levels of importance, and perceived ability to teach Agriculture Science by employing 50 identified agricultural pedagogical competencies. The model employed for the study was the Borich Needs Assessment Model. A combination of software packages were used to solve the model, including SPSS and Stata. The fifty competencies used were grouped into eight (8) constructs based on which analyses were done. The constructs used are as follows: engaging and supporting students learning, creating and maintaining effective environment, organizing subject matter, planning of instruction, assessing student learning, execution of instructions, management and professional role and development.

For Supporting and Engaging Students Learning construct, the teachers indicated that Engaging Students in Problem Solving that makes Subject Matter Meaningful was of the highest perceived importance with an average mean value of 3.94; Planning and Implementing Classroom Procedure had the highest importance mean of 4.05 for Creating and Maintaining Effective Environment construct. Developing Students' Understanding through Instructional Strategies with a mean value of 4.15 was classified as the most important competency from Organizing Subject Matter construct. Developing



and Sequencing Instructional Materials with a mean value of 4.00 was perceived to be of the highest importance for the Planning of Instruction construct. Using Multiple Sources of Information with a mean value of 3.83 was rated as the most important from Assessing Student Learning construct. Teaching using Experiments with a mean value of 3.91 was found to be the most important competency from Execution of Instruction construct. Encouraging Students to Exercise Self-discipline and Work with Administrative Personnel with respective mean values of 4.06 and 4.08 were perceived to be of the most importance in the seventh and eighth constructs.

Overall Organizing Subject Matter construct with an average mean value of 3.98 and that of Creating and Maintaining Effective Environment construct with an average mean value of 3.98 were perceived as the most important constructs regarding the competencies. Engaging and Supporting Students Learning construct with an average mean value of 3.65 was categorized as the least important construct regarding the competencies as a whole.

The study also sought to determine the perceive abilities of the respondents based on the competencies. The respondents were expected to rank their levels of abilities of the identified competences in the eight (8) constructs.

Engaging Students in Problem Solving that makes Subject Matter Meaningful and Self-directed Reflective learning for Students with a mean 3.08 respectively from Engaging and Supporting Students Learning construct were rated by the teachers as having the highest ability. The teachers rated themselves as having the highest ability for Using Instructional time effectively and Planning and Implementing Classroom Procedure a respective mean value of 3.17 from Creating and Maintaining Effective Environment



construct, Interrelating ideas and Information within and across Subject matter with a mean value of 3.30 was selected by the teachers as having highest ability for Organizing subject matter construct. For Planning of Instruction construct, the teachers possessed the highest ability for Selecting Tools and Equipment for a lesson with a mean value of 3.29. Using Multiple Sources of Information with a mean of  $M=3.39$  from Assessing Students Learning construct was categorized by the teachers as holding the highest ability rating. Using Multimedia Equipment in Teaching and Teaching Record Keeping Skills with equivalent mean value of 3.18 from execution of instruction construct was rank as having the highest ability. Encouraging students to exercise self-discipline with a value of 3.35 was categorized by the teachers as possessing the highest ability rating for the Management construct. Communicating Point of View of Other Instructors with a mean of 3.21 was selected by the teachers as having the highest ability for the professional role and development construct. Overall, Assessing Students Learning construct with an average mean value of 3.28 was ranked as having the highest perceived ability. Whereas Professional Role and Development construct with an average mean value of 2.99 was classified as having the lowest perceived ability regarding the competencies as a whole.

The study also sought to determine the appropriate and best suite professional development needs using Mean Weighted Discrepancy Scores (MWDS). The perceived importance and the perceived ability for each of the 50 competencies from the eight constructs were used to calculate the MWDS. The MWDS for each competency was then used to rank the competencies in order to determine which ones had the highest need for professional development.



Engaging students in problem solving that makes subject matter meaningful with a MWDS of 3.99 had the highest need for professional development from Engaging and Supporting Students Learning construct. Planning and Implementing classroom procedure with a MWDS of 3.56 was rank as having the highest need for professional development for Creating and Maintaining Effective Environment construct. In Organizing Subject Matter construct, Developing Students' understanding through instructional strategies with MWDS of 4.28) was found to possessed the most need for professional development. Selecting Teaching techniques for a lesson with a MWDS of 3.16 was the highest for Planning of Instruction construct. Using results of assessment to guide instruction with a MWDS of 2.01 was also the highest for assessing students learning construct. For Planning and Conducting Field Trips with a MWDS of 3.49 recorded the most needed for Execution of Instruction construct. Encouraging students to exercise self-discipline with a MWDS of 2.89 from Management construct indicated the largest need for professional development among the competencies. Work with administrative personnel with a MWDS of 4.19 from Professional Role and Development construct was rated to possess the highest need for professional development.

Overall Professional role and development construct, with an average MWDS of 3.55, was rank as having the highest need for professional development regarding the competencies within the construct. Assessing Students Learning construct, with 1.69 average MWDS was rank as having the least amount of need for professional development.



## **Conclusion**

In conclusion, it is worth noting that the findings of this study can be generalized to Tamale Public Senior High Schools agricultural teachers who participated in this study and other analogous areas.

Ninety-one percent of the teachers who participated in this study are professionals and at least seventy-four percent of them had over a decade of teaching experience. This implies that the schools have teachers with vast experience and competence to deliver quality education. The teachers were mostly male.

The following competencies were identified to be more important to these teachers: developing students' understanding through appropriate instructional strategies, work with administrative personnel, encourage students to exercise self-discipline, planning and implementing classroom procedure, and control outburst of fighting. On the other hand, competencies that were discovered to be less or at least somewhat important include: promote attainment of goals of teaching profession, involving student in planning, using multimedia equipment in teaching.

The study also revealed that the teachers possess abilities in the following competency areas: using multiple sources of information, encourage students to exercise self-discipline, interrelating ideas and information within and across subject matter areas, selecting tools and equipment for lessons, using assessment results to guide instruction, control outburst of fighting, plan summary of lessons, carryout approved disciplinary actions when warranted, guiding students in assessing their learning, developing and sequencing instructional materials, communicate point of view of other instructors, among others.



on the other hand, the following were the competencies respondents were found to be lacking abilities in: using computers in classroom teaching, keeping pace with technological advancement in agriculture, identifying current trends of teaching profession, using research findings regarding effective teaching methods, involving students in planning, facilitating learning experience that promote autonomy, among others. This is an indication of a knowledge gap.

based on the discrepancies between the importance score and the ability scores the following competencies were identified for professional development or training: developing students' understanding through appropriate instructional strategies, work with administrative personnel, solving problems that make subject matter meaningful, promote attainment of goals of teaching profession, learning experience that promote autonomy, using materials and technology to make subject matter accessible, identify current trends of the teaching profession, planning and implementing classroom procedure, planning and conducting field trips, establishing learning climate that promotes fairness, motivation students to learn, using instructional time effectively, maintain ethical standards of a professional teacher, establishing and maintaining standards for students behaviors, select teaching techniques for a lesson, developing and sequencing instructional materials, keep pace with technological advancement in agriculture, and teaching using experiments.

Finally, the study revealed that, in order for the training to be effective for teachers to acquire pedagogical competencies further studies should be considered followed by workshops, seminars and specific training in order of preferences.



### 5.3 Recommendations and Suggestions

1. It is recommend that the Public Senior High Schools in Tamale should provide in-service training for their Agriculture Science teachers since they lack abilities in areas especially in using materials and technology to make subject matter accessible, effective use of instructional time, keep pace with technological advancement in agriculture, teaching using experiments, among others.
2. Even though the teachers rated the use of computers in classroom teaching to be of no importance, it is recommended that the schools should provide ICT facilities such as computers network services for their teachers to enhance their research abilities and usage.
3. It is further recommended that the Ghana Education Service (GES) and other cooperate bodies should focus on offering professional development opportunities for SHS Agriculture Science teachers through their institutionalised professional development structures.
4. We further suggest that future studies should consider including the students perspective in the research since they are the direct beneficiaries of education.
5. The researcher suggests that future studies should consider gender and experience perspectives so that data could be analysed based on gender and experience level of teachers.
6. Additionally, professional development programs should be offered to current teachers in these competency areas.



7. The research recommended to education authorities that Agricultural Science Teachers in SHS should be given in-service training in order to make them more effective.
8. It is suggested that the study should be replicated in other subject areas since the agriculture science subjects are not taught in isolation.





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## APPENDICES

### APPENDIX A

Questionnaire for Tamale Public Senior High Schools (SHS) Agricultural Science Teachers

My name is DAUDA ABUKARI conducting a study on the topic ‘**Assessing Professional Development Needs of Tamale public Senior High Schools Agricultural Science Teachers on Pedagogical Competency**’ for the Award of Masters of Philosophy (M. Phil.) in Agricultural Education at the University for Development Studies, Tamale. Your responses to this survey will be a privilege to help me complete this survey. All responses would be treated confidentially and would be used for academic purposes only.

Please provide appropriate response to the following questions:

#### Part One: Demographic Information

1. Age: 20 to 25 [ ] 26 to 30 [ ] 31 to 35 [ ] 36 to 40 [ ] 41 to 45 [ ] 46 and above [ ]
2. Sex: Male [ ] Female [ ]
3. Highest Academic qualification.  
Post-Secondary [ ] Diploma [ ] Graduate [ ] Masters [ ] HND [ ]
4. Highest Professional Qualification.  
Post-Secondary [ ] Diploma [ ] Graduate [ ] Masters [ ] HND [ ]
5. How long (years) have you been teaching agriculture at Senior High School?  
1 – 5 [ ] 6 – 10 [ ] 11 – 15 [ ] 16 – 20 [ ] 21 – 25 [ ] 26 – 30 [ ]
6. Are you a professional teacher? Yes [ ] No [ ]



7. Do your school a school farm and/or a garden for practical agric. lessons? Yes [  ]

No [  ]

8. Have you ever had an in- service training in your carrier as a teacher? Yes [  ]

No [  ]

### Part Two: Pedagogical Competencies

This part comprises two sections (A & B) that have to do with your training needs. Please answer all the questions as honestly as possible to enable us compile a complete picture of your training requirements. Each section is prefaced by instructions for completion.

Please read and follow these carefully.

In order to perform your job effectively as a teacher of agriculture you need relevant skills. You will see listed below a range of skilled activities many of which you undertake in performing your job. Look at each of these activities and then rate each one by ticking ( ) the appropriate number in the box. The first rating (A) is concerned with how important the activity is to the successful performance of your job; Second rating (B) is concerned with how well you currently perform that activity.

B: How well do you consider that you currently perform this activity?

**Rating: 1-No ability    2- Below average ability    3-average ability**

**4- Above average ability    5- exceptional ability**

E.g.: If you feel that your ability to apply “instructional time effectively”

Is “below average ability” please select “below average ability” under B ratings



A: How important is this activity to the successful performance of your job?

**Rating: 1-No importance 2 – Below average importance 3 – Average importance**

**4 – above average importance 5 – Utmost importance**

E.g.: If you feel that “using instructional time effectively” has “above average importance”

Please select “above average importance” under A ratings.

**Engaging and Supporting Students Learning construct**

A

B

1	Connecting students prior knowledge with learning goals	1	2	3	4	5	1	2	3	4	5
2	Facilitating learning experiences that promote autonomy	1	2	3	4	5	1	2	3	4	5
3	Solving problems that make subject matter meaningful	1	2	3	4	5	1	2	3	4	5
4	Promoting self-directed reflective learning for students	1	2	3	4	5	1	2	3	4	5





**Creating and Maintaining Effective Environment construct**

		A					B				
1	Creating learning environment that engages students	1	2	3	4	5	1	2	3	4	5
2	Establishing learning climate that promotes fairness	1	2	3	4	5	1	2	3	4	5
3	Establishing & maintaining standards for students behaviour	1	2	3	4	5	1	2	3	4	5
4	Using instructional time effectively	1	2	3	4	5	1	2	3	4	5
5	Planning & implementing class room procedure	1	2	3	4	5	1	2	3	4	5

**Organizing Subject Matter construct:**

		A					B				
1	Demonstrate knowledge of subject matter	1	2	3	4	5	1	2	3	4	5
2	Interrelating ideas & information within and across subject matters areas	1	2	3	4	5	1	2	3	4	5
3	Developing students understanding through appropriate instructional strategies	1	2	3	4	5	1	2	3	4	5
4	Using materials and technology to make subject matter accessible	1	2	3	4	5	1	2	3	4	5



**Planning of Instruction construct:**

		A					B				
1	Drawing on and valuing students back grounds	1	2	3	4	5	1	2	3	4	5
2	Developing and sequencing instructional materials	1	2	3	4	5	1	2	3	4	5
3	Involve students in planning	1	2	3	4	5	1	2	3	4	5
4	Design short and long-term plans to foster leaning	1	2	3	4	5	1	2	3	4	5
5	Select methods of evaluating student performance	1	2	3	4	5	1	2	3	4	5
6	Determine student needs and interests	1	2	3	4	5	1	2	3	4	5
7	Select teaching techniques for a lesson	1	2	3	4	5	1	2	3	4	5
8	Plan introduction of a lesson	1	2	3	4	5	1	2	3	4	5
9	Select tools and/or equipment for a lesson	1	2	3	4	5	1	2	3	4	5
10	Plan the summary of a lesson	1	2	3	4	5	1	2	3	4	5

**Assessing Student learning construct:**

		A					B				
1	communicating learning goals to students	1	2	3	4	5	1	2	3	4	5
2	using multiple sources of information	1	2	3	4	5	1	2	3	4	5
3	guiding students in assessing their learning	1	2	3	4	5	1	2	3	4	5
4	Using results of assessment to guide instruction	1	2	3	4	5	1	2	3	4	5



**Executions of Instructions construct:**

A B

1	Using computers in classroom teaching	1	2	3	4	5	1	2	3	4	5
2	Using multimedia equipment in teaching	1	2	3	4	5	1	2	3	4	5
3	Teaching record keeping skills	1	2	3	4	5	1	2	3	4	5
4	Teaching about public issues regarding agriculture	1	2	3	4	5	1	2	3	4	5
5	Teaching agriculture knowledge and skills	1	2	3	4	5	1	2	3	4	5
6	Motivating students to learn	1	2	3	4	5	1	2	3	4	5
7	Teaching using experiments	1	2	3	4	5	1	2	3	4	5
8	Teaching students problem- solving skills	1	2	3	4	5	1	2	3	4	5
9	Teaching agricultural relationship with the environment	1	2	3	4	5	1	2	3	4	5
10	Planning & conducting field trips	1	2	3	4	5	1	2	3	4	5

**Management construct:**

A B

1	Identify new tools and/or equipment needed	1	2	3	4	5	1	2	3	4	5
2	Structure filing system for records and reports	1	2	3	4	5	1	2	3	4	5
3	Devise filing system for instructional materials	1	2	3	4	5	1	2	3	4	5
4	Carry out approved disciplinary action when Warranted	1	2	3	4	5	1	2	3	4	5
5	Encourage students to exercise self-discipline	1	2	3	4	5	1	2	3	4	5
6	Control outbursts of fighting	1	2	3	4	5	1	2	3	4	5



**Professional Role and Development construct:**

		A					B				
1	Identify current trends of the teaching profession	1	2	3	4	5	1	2	3	4	5
2	Use research findings regarding effectiveness of teaching methodology	1	2	3	4	5	1	2	3	4	5
3	Promote the attainment of the goals of the teaching profession	1	2	3	4	5	1	2	3	4	5
4	Maintain the ethical standards expected of a professional teacher	1	2	3	4	5	1	2	3	4	5
5	Work with department heads and/or other administrative personnel	1	2	3	4	5	1	2	3	4	5
6	Communicate points of view to other instructors	1	2	3	4	5	1	2	3	4	5
7	keep pace with technological advancement in agriculture	1	2	3	4	5	1	2	3	4	5

**Part Three: Professional Development Opportunities**

This section involves the various training methods available for pre-service and in-service training programmes. Indicate as appropriately as possible in the listed below the method/s you will want to undertake your training in order of preference on a liker t- type rating scale of 1-5

Ratings: 1-not preferred 2-less preferred 3-more preferred 4-most preferred 5- highly preferred



1.	In House Training	1	2	3	4	5
2.	Short Courses	1	2	3	4	5
3.	Specific Training	1	2	3	4	5
4.	Further Studies	1	2	3	4	5
5.	Seminars	1	2	3	4	5
6.	Workshops	1	2	3	4	5
7.	Apprenticeships	1	2	3	4	5
8.	Conferences	1	2	3	4	5

Any additional comments

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## APPENDIX B

### Perceived Importance and Mean Scores for the entire Competencies

Rank	Competencies	M	SD
1	Developing Students' understand through instructional strategies	4.15	0.899
2	Work with department heads and or other administrative personnel	4.08	1.057
3	Encourage students to exercise self-discipline	4.06	1.006
4	Planning and Implementing classroom procedure	4.05	1.029
5	Control outburst of fighting and aggressive behavior	4.02	1.116
6	Developed and Sequenced Instructional Materials	4.00	0.992
7	Promote the attainment of the goals of the teaching profession	4.00	1.19
8	Using Instructional time Effectively	3.98	1
9	Interrelating ideas and information within and across subject matter areas	3.97	0.992
10	Engaging students in problem solving that makes subject matter meaningful	3.94	1.08
11	Communicate point of view of other instructors	3.94	0.99
12	Using Materials, resources and technology to make subject matter accessible	3.91	1.034
13	Teaching using Experiments	3.91	1.034
14	Carryout approved disciplinary actions when warranted	3.91	1.212
15	Use research findings regarding the effectiveness of teaching methods	3.91	0.988



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16	Demonstrate knowledge of subject matter content	3.89	1.266
17	Select tools and/or equipment for a lesson	3.89	1.097
18	Maintain the ethical standards expected of a professional teacher	3.88	1.183
19	Establishing learning climate that promotes fairness and respect	3.86	1.051
20	Establishing and Maintaining Students Standards and behaviors	3.86	0.99
21	Plan introduction of a lesson	3.86	1.22
22	Motivation students to learn	3.86	1.175
23	Teaching agriculture knowledge and skills	3.85	1.07
24	Planning and conducting field trips	3.85	1.085
25	Using multiple sources of information	3.83	0.986
26	Identify current trends of the teaching profession	3.83	1.131
27	Plan summary of a lesson	3.82	1.036
28	Creating learning Environment that engages students	3.8	1.243
29	Using results of assessment to guide instruction	3.8	1.166
30	Identify new tools and equipment needed	3.8	1.112
31	Select Teaching techniques for a lesson	3.79	1.183
32	Teaching students problems solving skills	3.73	1.171
33	Teaching about public issues regarding agriculture	3.71	1.262
34	Self-directed reflective learning for students	3.7	1.136
35	Design short term and long term plan to foster learning	3.7	1.228
36	Select method of evaluating student performance	3.7	1.252
37	Teaching record keeping skills	3.7	1.037
38	Teaching agriculture relationship with the environment	3.67	1.086

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39	Structure a file system for records and reports	3.65	1.157
40	Device a filing system for instructional material	3.65	1.234
41	Communicating learning goals for students	3.64	1.285
42	Guiding students in assessing their learning	3.64	1.104
43	Keep pace with technological	3.64	1.273
44	Drawing on and valuing students' background	3.59	1.15
45	Determine students' needs and interest	3.58	1.229
46	Connecting students' prior knowledge with learning goals	3.55	1.279
47	Facilitating Learning experience that promote autonomy	3.42	1.19
48	Using multimedia equipment in teaching	3.38	1.345
49	Involved the student in planning unit	3.3	1.381
50	Using computers in classroom teaching	3.23	1.401





## APPENDIX C

### Perceived Ability and Mean Scores for the entire Competencies (N=66)

Rank	Competencies	M	SD
1	Using multiple sources of information	3.39	1.311
2	Encourage students to exercise self-discipline	3.35	1.452
3	Interrelating ideas and information within and across subject matter areas	3.3	1.403
4	Select tools and/or equipment for a lesson	3.29	1.465
5	Using results of assessment to guide instruction	3.27	1.431
6	Control outburst of fighting and aggressive behavior	3.27	1.504
7	Plan summary of a lesson	3.26	1.396
8	Carryout approved disciplinary actions when warranted	3.26	1.385
9	Guiding students in assessing their learning	3.23	1.444
10	Developed and Sequenced Instructional Materials	3.21	1.271
11	Communicate point of view of other instructors	3.21	1.431
12	Communicating learning goals for students	3.2	1.384
13	Using multimedia equipment in teaching	3.18	1.323
14	Teaching record keeping skills	3.18	1.323
15	Using Instructional time Effectively	3.17	1.565
16	Planning and Implementing classroom procedure	3.17	1.365
17	Demonstrate knowledge of subject matter content	3.17	1.453
18	Identify new tools and equipment needed	3.17	1.399
19	Teaching agriculture knowledge and skills	3.15	1.218





20	Teaching students problems solving skills	3.14	1.38
21	Developing Students' understand through instructional strategies	3.12	1.483
22	Drawing on and valuing students' background	3.12	1.376
23	Teaching using Experiments	3.12	1.473
24	Structure a file system for records and reports	3.12	1.398
25	Plan introduction of a lesson	3.09	1.465
26	Teaching about public issues regarding agriculture	3.09	1.4
27	Engaging students in problem solving that makes subject matter meaningful	3.08	1.407
28	Self-directed reflective learning for students	3.08	1.407
29	Creating learning Environment that engages students	3.08	1.373
30	Connecting students' prior knowledge with learning goals	3.05	1.318
31	Establishing and Maintaining Students Standards and behaviors	3.05	1.375
32	Select method of evaluating student performance	3.05	1.472
33	Maintain the ethical standards expected of a professional teacher	3.05	1.583
34	Work with department heads and or other administrative personnel	3.05	1.534
35	Teaching agriculture relationship with the environment	3.03	1.392
36	Design short term and long term plan to foster learning	3.02	1.387
37	Motivation students to learn	3.02	1.409

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38	Device a filing system for instructional material	3.02	1.364
39	Promote the attainment of the goals of the teaching profession	3.02	1.514
40	Determine students' needs and interest	3.00	1.289
41	Using Materials, resources and technology to make subject matter accessible	2.98	1.342
42	Establishing learning climate that promotes fairness and respect	2.97	1.425
43	Select Teaching techniques for a lesson	2.95	1.462
44	Planning and conducting field trips	2.94	1.424
45	Facilitating Learning experience that promote autonomy	2.92	1.502
46	Involved the student in planning unit	2.91	1.298
47	Use research findings regarding the effectiveness of teaching methods	2.91	1.496
48	Identify current trends of the teaching profession	2.89	1.57
49	Keep pace with technological advancement in agriculture	2.77	1.486
50	Using computers in classroom teaching	2.7	1.391

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## APPENDIX D

### Mean Weighted Discrepancy Scores for the Entire Competencies (n=66)

Rank	Competencies	MWDS
1	Developing Students' understand through instructional strategies	4.28
2	Work with department heads and or other administrative personnel	4.19
3	Engaging students in problem solving that makes subject matter meaningful	3.99
4	Promote the attainment of the goals of the teaching profession	3.94
5	Use research findings regarding the effectiveness of teaching methods	3.91
6	Facilitating Learning experience that promote autonomy	3.89
7	Using Materials, resources and technology to make subject matter accessible	3.61
8	Identify current trends of the teaching profession	3.6
9	Planning and Implementing classroom procedure	3.56
10	Planning and conducting field trips	3.49
11	Establishing learning climate that promotes fairness and respect	3.45
12	Motivation students to learn	3.28
13	Using Instructional time Effectively	3.26
14	Maintain the ethical standards expected of a professional teacher	3.23
15	Establishing and Maintaining Students Standards and behaviors	3.16





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16	Select Teaching techniques for a lesson	3.16
17	Developed and Sequenced Instructional Materials	3.15
18	Keep pace with technological advancement in agriculture	3.14
19	Teaching using Experiments	3.08
20	Plan introduction of a lesson	2.99
21	Encourage students to exercise self-discipline	2.89
22	Communicate point of view of other instructors	2.87
23	Demonstrate knowledge of subject matter content	2.83
24	Creating learning Environment that engages students	2.77
25	Interrelating ideas and information within and across subject matter areas	2.65
26	Carryout approved disciplinary actions when warranted	2.55
27	Design short term and long term plan to foster learning	2.52
28	Identify new tools and equipment needed	2.42
29	Select method of evaluating student performance	2.41
30	Select tools and/or equipment for a lesson	2.36
31	Teaching agriculture relationship with the environment	2.33
32	Device a filing system for instructional material	2.32
33	Teaching about public issues regarding agriculture	2.31
34	Self-directed reflective learning for students	2.3
35	Teaching students problems solving skills	2.2
36	Plan summary of a lesson	2.14
37	Determine students' needs and interest	2.06

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38	Using results of assessment to guide instruction	2.01
39	Structure a file system for records and reports	1.93
40	Teaching record keeping skills	1.9
41	Connecting students' prior knowledge with learning goals	1.77
42	Using multimedia equipment in teaching	1.74
43	Using computers in classroom teaching	1.71
44	Drawing on and valuing students' background	1.69
45	Using multiple sources of information	1.68
46	Communicating learning goals for students	1.59
47	Guiding students in assessing their learning	1.49
48	Involved the student in planning unit	1.3
49	Teaching agriculture knowledge and skills	0
50	Control outburst of fighting and aggressive behavior	0

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