



HOW ARE TEACHERS TRAINED FOR TEACHING COMPETENCE-BASED GRADE FOUR AGRICULTURE? A CASE OF PUBLIC PRIMARY SCHOOLS IN NJORO SUB-COUNTY IN NAKURU COUNTY

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Abstract

One of the major aims of vision 2030 is to ensure Kenya becomes a middle-income economy through industrialization. In the year 2017, Competence-Based Education (CBE) was introduced to produce school graduates with self-efficacy, self-reliance, effective communication, problem-solving, innovation, and digital literacy competencies. However, for students to acquire the competencies, quality teacher training is significant. This study sought to determine how teachers are trained for teaching CBE Grade Four Agriculture in the Njoro sub-County. A descriptive research design was used employing a cross-sectional survey method that generated quantitative data. A sample size of 96 teachers of agriculture was obtained from the 96 public primary schools in the six wards of Njoro Sub-County. Descriptive statistics were used for data analysis using Statistical Package for Social Sciences (SPSS) version 25. The findings of this study indicated that all of the grade four teachers of agriculture had attended CBE training but the majority of them (49%) attended purely theoretical sessions, 59.4% of the teachers cited the teacher-trainers were not competent. In addition, at least 16% of the teachers indicated that the training sessions were not relevant to teaching Agriculture subject. This study recommended that the Ministry of Education develop a framework for practical teacher training. Teacher trainers should be re-trained and training sessions should be aligned towards specific subjects, teacher needs, and students' needs to increase relevance.

Keywords: *Teacher training; Agriculture; Competence-Based Teaching; Education*

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1. Introduction

Education reform is central since it enables a country to revisit and evaluate education quality, equity, and relevance. The introduction of Competence-Based Education in Kenya in 2017 was to ensure education addresses the needs of the society for sustainable economic development (M'mboga & Beatrice, 2021). However, teachers are among the key stakeholders in education, they determine the quality of the school graduates and the level of competence acquired. Teacher training in Kenya existed even before the coming of the Europeans since there was Indigenous African Education (IAE), which produced competent teachers who were custodians of traditional systems. However, formal teacher education in Kenya started in the mid-nineteenth century by Missionaries (Selhausen, 2019). Teacher education training was designed in a way that could energize learners' skills and competencies. The Kenyan government echoed the same view in the Sessional Paper No. 6 of 1988 when it said, "There is urgent need to develop and promote teacher education program if the administration of education in the country is to succeed and national development is to be accelerated" (Otieno, 2016).

Teacher education in Kenya is categorized into Early Childhood Development Education, primary teacher education, diploma teacher education, and graduate teacher education. The pre-service primary teachers do not have subject specialization once admitted to the teachers' Training Colleges (TTC) but they study basic skills and concepts. In the in-service program, the teachers are taught new instructional skills which promotes quality teacher training (Odhiambo, 2021). In the 8-4-4 education system, agriculture subject was embedded under science at the primary level while in secondary school the subject was an elective. However, in the CBE, agriculture is a compulsory standalone subject starting in grade four (Makunda et al., 2022).

After the implementation of CBE, the primary teachers have been attending seminars, workshops, and 9-month in-service training for CBE compliance (Nyaundi, 2021). Therefore, this study focused on the extent to which grade four teachers of agriculture have been inducted and oriented to CBE rubrics in teaching agriculture.

1.1. Describe relevant scholarship

Chinese students have always performed better in the Programme of International Student Achievement (PISA) as a result of quality teacher training (Li et al., 2019). Teacher quality has a great influence on determining the academic achievement of students. For instance, an increase in teacher subject specialization leads to high teaching efficiency thus making a teacher more competent and leading to high academic achievement (Liu et al., 2016). In addition, in Finland, one of the countries whose students have recorded excellent results internationally for the last 20 years, primary teachers and class teachers have subject specialization. Teacher training in Finland is considered important thus much effort is put

during pre-service training whereby a primary school teacher must earn a master degree to be certified to conduct teaching (Wolff et al., 2022).

In the year 2000, Uganda restructured its education at the primary level to ensure students acquired competencies in agriculture and enable young people to acquire and apply practical skills (Sidonia & David, 2019). There was an open teacher-training school for in-service mentorship. However, the teachers showed less interest and were not prepared to embrace practical teaching of vocational subjects since the training they got was not relevant to the available teaching resources. This teachers' unpreparedness resulted in theoretical teaching hence compromising learners' competencies (Okiror et al., 2017).

A study conducted in Tanzania in the year 2014 revealed that the pre-service teachers were aware of the changes in their education system (Paulo, 2014). However, the pre-service teachers were not well trained in the utilization of instructional resources, teaching and assessment methods used under the CBE. For example, in classroom instruction the application of learner-centered approaches, teachers were not able to effectively balance the various teaching methods leading to a theoretical and superficial teacher-centered approach. Those who formed group discussions formed groups of between (9-18) due to a large learner population and these were not effective to manage. A teaching method is a good indicator of teachers' preparedness, (Paulo, 2014).

2. Method

2.1. Study Area

The study was carried out in Njoro Sub-County of Nakuru County Kenya. Njoro is one of the eleven sub-counties of Nakuru County in the former Rift Valley province, Kenya. Nakuru borders seven counties; Laikipia to the north East, Kericho to the west, Narok to the southwest, Kajiado to the south, Baringo to the north, Nyandarua to the east, and Bomet to the west (County Government of Nakuru, 2018). The county has a population of 2,162,202 and covers an area of 7,510 square kilometers (Kenya National Bureau of Statistics, 2020). The sub-county has 96 public primary schools. The Data was collected from six wards in the sub-county; Mau Narok, Mauche, Kihingo, Nesuit, and Lare to ensure that each ward was represented to avoid bias and generalization of data collected. According to the MoE (2019), teachers should expose learners beyond the school environment to practical lessons by visiting community farms and agricultural learning institutions if their schools do not have adequate instructional resources. Njoro Sub-County is close to Rift Valley of Science and Technology and Egerton University and it has many farming activities both small and large scales within the community. Therefore, the location was ideal for the study.

2.2. Characteristics of Grade Four Teachers of Agriculture

The study examined the characteristics of the grade four teachers of Agriculture who took part. The sets of the teachers' characteristics that were examined included gender, number of lessons for grade four teachers per week, level of education, teacher training, the competence level of the CBE trainers, mode of instruction that was used for teacher training, and relevance of training attained to teaching grade four agriculture.

2.3. Sample size and Sampling procedures

The sample size is the small group of individuals obtained from a target population whereas sampling involves concluding the target population using a subset of the population (Ondimu, 2018). The accessible population was 131 grade four teachers of agriculture and the sample size of 96 teachers was used. Census was used to collect data from 96 teachers from 96 schools. In schools that had more than one agriculture teacher for grade four, one teacher with teaching experience was selected. In cases where a school had more than one teacher of agriculture with three years of teaching experience, simple random sampling was used to select one.

2.3.1. Measures and covariates

The study employed the use of a survey questionnaire, which was developed by the researcher. The questionnaire captured dependent and independent variables. The questionnaire contained both open-ended and closed-ended items based on the objectives of the study. Reliability of 0.743 was attained using Cronbach Alpha.

2.3.2. Research design

The study used a descriptive survey which was informed by using a questionnaire. The design was appropriate for this study because the population was spread across the sub-county. The design was important in this study in determining institutional preparedness in the teaching of grade Four Agriculture. The survey was chosen because it's appropriate for educational fact-finding as it gives ideal information that is accurate, and helps the researcher to establish clear information that the researcher intended to collect without manipulating the variables of the study (Johnson & Christensen, 2019).

3. Results and Discussion

3.1 Gender of Respondents

There was a need to find out the gender of grade four teachers of agriculture and the results are shown in figure 1. The majority of the grade four teachers of agriculture were male

(64 %) while females were few with 36%. In a reflection on the ratio of females to males in the formal sector, there is a gender gap where males are the majority. The findings of this study tally with results recorded in a research conducted in Nigeria by Enfield (2019) evaluating gender roles and inequality in the Nigerian labor market which cited that women were few. Another study conducted in examining the gender distribution in 10 tertiary institutions in Uganda and 158 fields revealed that the ratio of men to women was 8:2 with more males in science courses as females dominated in arts courses (Odaga, 2020).

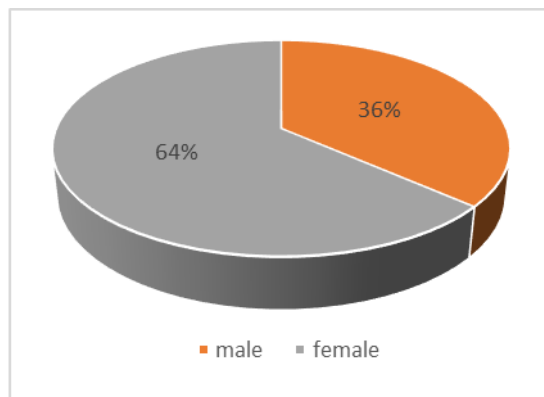


Figure 1. *Gender of grade four Agriculture teachers*

According to Makarova *et al.* (2019), a study conducted on primary school teachers on subject prevalence for male and female teachers revealed that male teachers preferred vocational subjects while female teachers opted for art-based subjects. The presence of few female teachers in agriculture could be a result of female teachers having more family responsibilities compared to men thus they opt to choose subjects that will allow them to manage home duties after school with less fatigue (Aalto, 2020).

3.2 Respondent’s Workload

The workload per teacher of agriculture in a week was examined and the findings were as shown in Figure 2. This was necessary for determining if the other subjects had any negative effect on the teaching of agriculture subject.

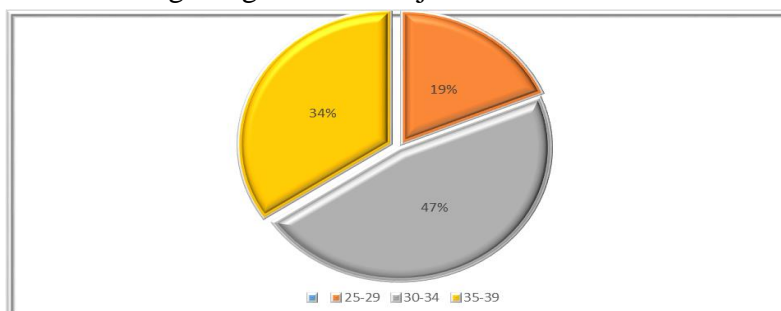


Figure 2. *Total Workload per grade Four Teacher of Agriculture in a week*

To Figure 2, many teachers (47%) had between 30-34 lessons per week, 34% of teachers had the highest number of lessons (35-39) while 19% of teachers had 25-29 lessons per week. Agriculture is a hands-on subject, it requires teachers to create more time for conducting both classroom instruction and psychomotor activities. For instance, teachers with 35-39 lessons cited that they spent much time in class compared to carrying out practical activities at the farm due to inadequate time. In addition, the teachers with 30-39 lessons confirmed that they had a challenge in managing time (35minutes per lesson) in conducting practical and project activities since many students took the teacher's time to make them settle before starting practical activities.

The findings of this study conform with the Ministry of Education guidelines (Ministry of Education, 2018). The MoE (2018) indicates that the minimum number of lessons per primary school teacher in a week in a public primary school should be 30. However, Figure 2 categorized lessons with 25 being the least and 39 being the maximum because in some schools some teachers had less than 30 lessons. The schools where the teachers had few lessons are an indicator of adequate staff while the ones where a teacher had 39 lessons are a case of understaffing. The findings are in tandem with a study conducted by Nyambura (2018) who found out that when teachers have more than 35 lessons per week as a result of teacher deficiency thus teachers opted for theoretical teaching as opposed to a practical approach thus negatively influencing the competencies acquired by students. Human resource is a challenge in Kenya's primary schools across the country where there is a deficit of fifty thousand teachers (Omariba, 2022).

3.3 Respondent's Education Level

The agriculture teachers were asked to indicate their education level and the findings were as recorded in Table 1.

Table 1. Grade four Agriculture Teacher's Education Level

	Frequency	Valid Percent
P1	27	28.1
Degree	34	35.4
Diploma	35	36.5
Total	96	100.0

Diploma holders were the majority with 36.5% and the P1 teachers were the minority with 28.1%. The high number of Diploma and Degree holders could be associated with Teachers Service Commission (TSC) guidelines that give priority to the employment of Diploma teachers to P1 teachers under CBE. The teacher's education achievement may

influence the skills and competencies attained by a student. For instance, Diploma and Degree holders in a subject tend to have more exposure and advanced skills in teaching a given subject. The P1 teacher tends to cover fewer units at Teachers Training College (TTC) where they learn basic units. A study by Obuhatsa, (2020) revealed that some teacher factors like education level and teaching experience not only play a role in the skills acquired by the students but also affect teacher preparedness in the implementation of CBE.

The findings of this study are in agreement with TSC guidelines, which noted that the newly employed teachers under CBE were not competent enough. Therefore, the director of quality assurance recommended a 9-month training for P1 teachers to upgrade their studies not only to be CBE competent but also to get priority in TSC internships and employment (Nyaundi, 2021). Further Nyaundi (2021), indicated that the new TSC directive was to make at least 300,000 p1 teachers who are not employed register for a 9-month training. The high number of Diploma and degree teachers is an implication that the Government of Kenya is adjusting the human resource toward CBE requirements.

3.4 *The number of CBE training Sessions Attended between 2018-2022*

Grade four teachers of agriculture were asked about the number of training sessions they attended from 2018 to the year 2022. The findings were as indicated in Table 2

Table 2. Number of CBE training Sessions Attended between 2018-2022

	Frequency	Percent
Single training	6	6.3
Two training sessions	29	30.2
Three training sessions	45	46.9
More than three sessions	16	16.7
Total	96	100.0

Looking at Table 2, the entire grade four teachers of agriculture had attended CBE training whereby it was observed that 77.1% attended at least two sessions, 6.3% attended a single session and 16.7% attended more than three sessions. The 100% attendance in teacher training could be due to the teachers' interest to learn new concepts and approaches that were pertinent to teaching agriculture subject. Another possible reason for 100% attendance in teacher training sessions could be that the training was considered a mandatory exercise. The findings of this study agree with a study done by Waweru (2018) who found that in the implementation of a new curriculum, it is a must that every teacher be trained to internalize the duties which will enable a learner to acquire skills that will make their academic future bright.

The number of teacher training sessions is directly proportional to the level of competence a teacher will acquire. A study by Aziz (2022) on the impact of teacher training revealed that teachers who were exposed to many training sessions had higher levels of classroom management, pedagogical skills, and student assessment skills as opposed to those with few or no training sessions. About 36.5% of teachers had attended at least one training session. If the training sessions do not meet the teacher's needs, they may not contribute to improving teachers' skills. For instance, a study conducted by Ningtiyas and Jailani (2018) indicated the number of training sessions had nothing to do with the knowledge and skills acquired by teachers if the training were not in line with the subject area. The teachers attending few sessions were found to be more competent than teachers who attended many sessions, which were too general. According to Hafeez (2021), the number of training sessions is directly proportional to the teacher's professional experience. Therefore, teachers with few training sessions have less teaching experience.

A study by Lukindo (2016) on curriculum implementation in Tanzania revealed that despite teachers being aware of CBE, they maintained the traditional teaching method of pen and paper. The teachers cited that they were applying the skills and knowledge learned in the teacher's college and not what they learned in seminars since the seminar's training was not subject-specific. However, it was observed that continuous teaching of teachers with a specification to teachers' subjects; led to a shift from traditional teaching strategies to CBE requirements. Based on the foregoing literature, a combination of the relevant teacher training sessions and a teacher's professional experience will lead to an increase in the level of the teacher's competence.

3.5 Competence Level of the CBE Trainers

The study sought to find out the teacher's perception of the degree of competence of the trainers on a five-point Likert scale and the results were tabulated in Table 3.

Table 3. Competence Level of the Trainers who guided grade four Teachers during CBE training

	Frequency	Valid Percent
Not competent	57	59.4
somehow competent	7	7.3
competent	18	18.8
very competent	10	10.4
Extremely competent	4	4.2
Total	96	100.0

From the data in Table 3, the majority of the teachers (59.4%) said the trainers were not competent, 18.8 % said the trainers were competent, 7.3% said the trainers were somehow competent and 4.2% cited that the trainers were extremely competent. The 59.4% who said the trainers were not competent could be among the individuals who attended the theoretical sessions where they did not do any hands-on activities. Another possible reason for the trainers being incompetent could be that the workload for the trainers was a lot hence reducing the efficiency. This contention is in agreement with a study by Lukindo (2016) who found that when the period for teacher training was limited, the trainers seemed to rush through the content making the trainees unable to comprehend the training sessions making training less efficient. One of the teachers of agriculture reported that when there was the need for the trainer to clarify some concepts, the trainers told them, "Even us we did not understand everything when we were taught so try to apply at your schools what you think is applicable". For instance, in the use of ICT tools, the teachers were the ones helping the trainers in connecting and using some resources. Another teacher said, "Some of us were more conversant and competent than the trainers." The findings of this study are in agreement with a study by Pale and Amukowa (2020) who found that during the CBE implementation, the trainers themselves were incompetent since they seemed to have not conceptualized and understood the rubrics thus they were not able to facilitate the training.

Teacher competence is dependent on the quality of training. A study conducted in the United States revealed that about 5% to 15% of the teachers exhibited poor classroom management and could not make a good student-teacher relationship as a result of incompetent teacher training programs (Range et al., 2012). A few teachers (10.6%) cited that the trainers were very competent. The possible reasons for the teachers citing the trainers were very competent; it could be that some grade four agriculture teachers are part of the panel that trains teachers. In our research, one agriculture teacher said, "I have attended more than 3 sessions as a trainee but currently I am among the panel that trains fellow teachers." Over 15 years, Finland has posted excellent academic results globally. A study conducted by Pollari et al. (2018) cited that teacher trainers in Finland are competent whereby many of them are Ph.D. holders and they are subject-specific on what to train teachers. Given that the trainers are competent, the trained teachers are given the freedom to design pedagogical approaches and how manage the classes without being supervised. Teacher training in Finland requires a primary school teacher to have a minimum of a master's degree that must be awarded from any of the 9 accredited universities for teacher training. Experienced and competent trainers conduct teacher training in Scotland. A study by (Bain & Gray, 2018) revealed that quality teacher trainers are professionals whose main responsibility is to conduct research and evaluate the loopholes in the curriculum and develop a quality framework for teacher training. In the united states of America and Britain, an individual must exhibit academic competence and professionalism to be acknowledged in teacher training programs (Zulfakar, 2020). A

reflection on Table 3, at least 59.4% of teachers cited the trainers were not competent. This implies that the level of competence the teachers acquired may not help them in becoming CBE compliant. Since curriculum implementation is a continuous process, there is a need for teacher trainers to be re-tooled before they embark on conducting training sessions.

3.6 *The mode of Instruction that was used for Teacher Training under CBE*

Table 4. The mode of Instruction used for Teacher Training under CBE

	Frequency	Valid Percent
Theory	47	49.0
Practical	13	13.5
Both practical and theory	36	37.5
Total	96	100.0

The findings of Table 4 indicated that the majority of the grade four agriculture teachers (49%) attended purely theoretical sessions, 13.5% indicated that they attended practical sessions while 37.5% said that the training they attended was both theory and practical. The high number of teachers attending theoretical sessions was a result of trainer incompetence as indicated in Table 3, which sought to establish the level of trainer competence. This contention is in tandem with previous studies by Koskei and Chepchumba (2020) which stated that the teachers were hurriedly trained whereby the period for teacher training was not enough for training the teachers on various CBE subjects and the trainers were not well prepared in inducting the teachers. The findings of this study are also in conformity with the study conducted in Zimbabwe on curriculum implementation and associated challenges. Curriculum implementation in Zimbabwe was done without consideration of quality teacher training and the provision of quality teaching resources. In the Zimbabwe context, teachers cited that they were not able to conduct CBE teaching since they were not well trained (Madondo, 2021). The competence of a teacher is greatly dependent on the quality of teacher training. A study by Redjeki et al.(2021) cited that practical teacher training not only improved the level of the institution but also social, professional, personal, and pedagogic competence. According to Ghorbani et al.(2018), teachers who learn through theoretical sessions, exhibit limited competencies and skills in classroom management. In addition, teachers who learned through theoretical sessions were found to teach their students theoretically something that compromised students' level of self-awareness, efficacy, and problem-solving Skills.

A study conducted in Namibia on the influence of teacher training on student competence cited that hands-on subjects required practical teacher training to achieve sustainable teaching and learning since the students needed to apply learned skills upon graduation. Therefore

theoretical teacher preparation had a negative impact on the future of school graduates (Anyolo et al., 2018). Table 4 findings indicate that 49% of teachers attended theoretical sessions. This implies that more efforts must be put to achieve quality teacher training. For instance implementation of CBE in Kuwait has failed as a result of poor teacher training approaches (Sadeq et al., 2020). Tanzania introduced CBE in the year 2005 to ensure education solved societal challenges. However, it was observed that by the year 2012 there was no change in students' assessment and teacher's approach to content delivery. A study by Pale & Amukowa (2020) revealed that At least 80% of the teachers were not CBE compliant after attending some training sessions. The teachers cited that they were trained using pen and paper in a traditional way which hindered them from adopting new CBE guidelines. A study by Cook and Pavey (2018) revealed that the Finish teachers and students spend fewer hours in class and yet they post excellent results because teacher training sessions are hands-on. Therefore, for effective CBE implementation, there is needed effort for practical teacher training to perfume better like in Finland.

3.7 Relevance of Training attained to Teaching Grade Four Agriculture

Looking at Table 5, 41.7% of grade four agriculture teachers indicated the training they attended was not relevant to water conservation in farming, 39% said the training was not relevant to ICT usage and 30.5% said the training was not relevant to innovative gardening projects. A study by Samuel (2021) indicated that much of the CBE training is not reflecting the academic needs but gives general guidelines thus making it difficult for teachers to handle some sections when teaching. This contention is in tandem with Jane et al. (2020) who cited that teachers were provided with a song and they were expected to help learners sing but the musical notes were not provided. In addition, Jane (2020) found that during the training sessions, teachers were never subjected to any practical activity due to trainers citing the inadequacy of resources.

The study findings indicated that at least 41.7% of teachers said the CBE training they got was somehow relevant in coordinating learners' activities in groups and 39.6% reported that the training was somehow relevant in assessing learners' competencies. The findings of this study are in tandem with Reimers (2021) who found that most public primary schools in Kenya have many students per class against one teacher thus making it difficult for a teacher to plan and coordinate learning activities. At least 47.9% felt that the training was more relevant in using locally available materials in teaching grade four agriculture. The possible reason for teachers being able to utilize local materials could be that they are conversant with those materials thus; they needed no training over the same. Another possible reason could be that the resources used by teachers were readily available whenever the need arises. The findings of this study are in agreement with Amunge et al. (2021) who cited that in teaching science-related courses, learners were able to assemble required materials within the schools

and obtain other materials from the community. Table 5 below illustrates the relevance of training.

Table 5. Relevance of training attained to teaching grade four agriculture

Learning areas	Not relevant	Somehow relevant	Relevant	More relevant	Extremely Relevant
Innovative Gardening Project	30.5%	23.8%	29.0%	13.5%	3.1%
Water conservation in farming	41.7%	12.5%	19.8%	19.8%	6.3%
Use of ICT (tablets, video simulation, photos, and pictures) in teaching environmental conservation, and water conservation)	39.0%	22.9%	10.6%	20.1%	7.3%
Facilitating learning (gardening, making composite manure making)	16%	23.6%	31.3%	18.8%	10.4%
Assessment of learner's competencies	19.8%	39.6%	37.5%	3.1%	-
Coordinating learners' activities in groups	26%	41.7%	16.70%	6.3%	9.4%
Use of locally available materials in teaching	17%	2.8%	9.4%	47.9%	22.9%

4. Conclusions and Recommendations

This study concluded that;

- i. The level of teacher training was low given that much of the training sessions were theoretical.
- ii. The majority of the teacher trainers were not competent.
- iii. The training sessions were less relevant for teaching grade four agriculture.

The study recommends;

- i. The MoE to develop a framework for practical teacher training sessions.
- ii. The teacher trainers should be re-trained to ensure they are conversant and compliant with the CBE rubrics.

iii. The training sessions should be aligned towards specific subjects, teacher needs, and students' needs to increase relevance.

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Declaration of Conflicting Interests and Ethics

The authors declare no conflict of interest.

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