FARMER-PREFERRED LEARNING METHODS AND UTILISED TEACHING APPROACHES BY EGERTON UNIVERSITY, KENYA

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ABSTRACT

Universities are centres of frontier knowledge and skills, with the capacity to transform communities,when appropriately and adequately transmitted to users. The aim of this paper was to compare farmer-preferred learning methods and those utilised in teaching during Egerton University's outreach activities, with a view to drawing useful insights for more effective community future engagements. A cross sectional survey was conducted in 2017, using researcher-administered questionnaires, on a sample of 84 farmers purposefully selected from communities where Egerton University implemented extension outreach programmes. Key informant interviews and focus group discussions were also conducted for community leaders and extension officers in the selected Wards, to supplement data collection. Results showed that the decision to participate in the outreach activities implemented by Egerton University was personal, with nearly all the respondents (99%) citing acquisition of new knowledge and skills as the major reason. Demonstrations were the most preferred and utilised methods (90 and 92%, respectively); while the use of group discussions were preferred by 51% of the respondents and utilised in 86% of the outreach activities. Results also showed significant relations for demonstration ($\chi^2 = 17.21$, P<.001), touring university model farms ($\chi^2 = 68.11$, P<.001) and use of training videos ($\chi^2 = 40.98$, P<.001) between farmer-preferred learning methods and utilised teaching methods. This explains the popularity of demonstrations as a teaching and learning method of Egerton University in connecting theoretical and scientific aspects, to practice. Learner centred teaching methods, with the capacity to facilitate collaborative or cooperative learning, should be enhanced.

Key Words: Community engagement, extension, outreach

RÉSUMÉ

Les universités sont des centres de connaissances et de compétences, capables de transformer les communautés lorsqu'elles sont transmises de manière appropriée et adéquate aux utilisateurs. L'objectif de cette étude était de comparer les méthodes d'apprentissage privilégiées par les agriculteurs et celles utilisées dans l'enseignement pendant les activités de sensibilisation de l'Université d'Egerton, en vue de tirer des enseignements utiles pour des engagements futurs plus efficaces dans la

communauté. Une enquête transversale a été menée en 2017, à l'aide de questionnaires administrés par des chercheurs, sur un échantillon de 84 agriculteurs délibérément sélectionnés dans les communautés où l'Université d'Egerton a mis en œuvre des programmes de vulgarisation. Des entretiens avec des informateurs principaux et des discussions de groupe ont également été menés à l'intention des dirigeants communautaires et des agents de vulgarisation des quartiers sélectionnés, afin de compléter la collecte de données. Les résultats ont montré que la décision de participer aux activités de sensibilisation mises en œuvre par l'Université d'Egerton était personnelle, presque tous les répondants (99%) citant l'acquisition de nouvelles connaissances et compétences comme principale raison. Les démonstrations étaient les méthodes les plus préférées et utilisées (90 et 92%, respectivement); tandis que le recours aux discussions de groupe a été préféré par 51% des répondants et utilisé dans 86% des activités de sensibilisation. Les résultats ont également montré des relations significatives pour la démonstration (c2 = 17,21, P <0,001), les fermes modèles universitaires en tournée (c2 = 68,11, P <0,001) et l'utilisation de vidéos de formation (c2 = 40,98, P <0,001) entre les méthodes d'apprentissage privilégiées par les agriculteurs et les méthodes d'enseignement utilisées. Cela explique la popularité des démonstrations en tant que méthode d'enseignement et d'apprentissage de l'Université d'Egerton pour relier les aspects théoriques et scientifiques à la pratique. Les méthodes d'enseignement centrées sur l'apprenant, avec la capacité de faciliter l'apprentissage collaboratif ou coopératif, devraient être améliorées.

Mots Clés: Engagement communautaire, vulgarisation, sensibilisation

INTRODUCTION

Community engagement is considered a focal universities' activity globally, in transmitting frontier knowledge to the masses (Sandmann *et al.*, 2008; Singh, 2017; Groark and McCall, 2018). Preece (2016) argues that community engagement has its origin in the tradition of many university cultures, which share three missions: teaching, research and community service. Though this has been the culture for a long time, teaching in many universities, and especially in developing countries, has been conducted in isolation relative to issues that affect the immediate communities. Such discrepancy has resulted into generation of graduates, often out of touch with the realities of the communities they are destined to serve (O'Meara *et al.,* 2011).

Universities that proactively engage with communities in their outreach programmes tend to produce graduates with relevant professional ability to respond to societal needs and aspirations of their client communities (Van Leeuwen *et al.,* 2017). This engagement takes different forms, such as service-learning, community-based participatory research, community-responsive clinical and population based care, and community service, and outreach and advocacy (Calleson *et al.*, 2005). Egerton University has embraced all the above forms, save for advocacy. Through the Division of Research and Extension, the university is still building capacity to fully undertake its advocacy role. Presently, the focus of university-community engagements is to build mutual and reciprocal partnerships, a collaborative effort, and a shift from the deficit-focused models of yesteryears (O'Meara *et al.*, 2011; Preece, 2016; Burkhart-Kriesel *et al.*, 2019). As communities benefit from the Egerton University's intellectual capital, the university engages first hand with community problems and issues. This has the potential of transforming teaching and research programmes to focus on societies' needs and aspirations, consequently producing graduates capable of tackling issues pertaining to their communities (Van Leeuwen *et al.*, 2017).

Globally, institutions of higher learning have in the last few decades experimented with engaging communities in the generation and

dissemination of knowledge (Jadhav and Suhalka, 2016); Egerton University and other local and regional institutions of higher learning are no exception. Institutionalising outreach and extension programmes within university curricular is one way of engaging with communities and anchoring university teaching within societal needs and aspiration, especially for universities with an agriculture inclination (Burkhart-Kriesel *et al.,* 2019*)*. Community outreach is, therefore, essential for agriculture-based universities to contribute towards national development and attainment of the global development frameworks. Through outreach programmes, agriculture-based universities can, and do transform farmer knowledge, attitudes, behaviours and practices for improved livelihoods and well being (Kalule *et al.*, 2019).

However, methods utilised to impart knowledge and skills to farmers must align to learning preferences and contexts of farmers for maximisation of learning benefits. Delivery methods that transform abstractness of information into its applicability and usability are more desirable and developmental (Mulu-Mutuku *et al.,* 2017). Such methods are experiential-oriented, allowing for selective, reflective, self-directing and problem-centred learning suitable for adult learners (Cercone, 2008; Caffarella and Daffron, 2013), for example demonstrations, farm visits, use of videos, and group discussions.

Several academic departments of Egerton University have over the years engaged with communities through students' service-learning activities, community-based participatory research, community service, outreach and advocacy. These activities have mainly been in the areas of crop and livestock production, nutrition, health and sanitation, environmental conservation, rain water harvesting, value addition and income generation, family dynamics, among others. The Department of Applied Community Development Studies of Egerton University runs an elaborate community outreach programme in the context of service learning, entrenched in the curricular of Bachelor of Science in Community Development and B.Sc. Agriculture and Human Ecology Extension programmes since 2005. The objectives of these engagements are three-fold: (i) to improve the livelihoods and welfare of community members through sustainable development; (ii) to co-generate knowledge that can be utilised by community members for socio-economic development; and (iii) to provide students opportunities for experiential learning. Guided by the Malcolm S. Knowles' learning theory of andragogy (Knowles, 1980), students engage with communities to identify issues of concern using participatory methodologies, prioritise, plan, implement action and monitor the process and outcomes, with the faculty providing technical backstopping. However, the alignment of farmer preference to the andragogy methodologies used needs to be determined and lessons drawn for intensification of learning benefits. This study, therefore, examines insights from comparisons of farmer preferred learning methods, with those utilised in outreach programme activities which can inform future engagements.

METHODOLOGY

A cross sectional survey was conducted in Nakuru County, among households that participated in Egerton University community engagement activities between 2011 and 2016. Though the University's community engagement activities are spread over many counties of Kenya, this paper reports on a study conducted in five Wards in Nakuru County, namely, Elburgon, Menengai West, Mosop, Njoro, and Soin Wards,which were purposively selected to reflect areas where Egerton University's institutionalised outreach programme activities were concentrated during the time covered by the study.

Nakuru is a cosmopolitan county, within the rift valley region of Kenya, which enjoys a

bimodal rain season, recording on average between 700 and 1200 mm of rainfall annually. Agriculture is the main activity of the county, playing a critical role in provision of food and employment. Both subsistence and large-scale commercial farming are practiced in the County (GoK, 2013), though the University outreach activities of interest to this paper targets subsistence farmers.

Study sample. A list of communities that participated in outreach activities between 2011 and 2016, and contacts of the community leaders was sourced from Egerton University, Division of Research and Extension and the Department of Applied Community Development Studies. The community leaders who included farmer group leaders, and local administrators who included village elders and assistant chiefs were contacted to identify farmers who would participate in outreach activities within the stipulated time period. Extension officers in the identified Wards were also contacted to help identify and mobilise the farmers and assist in facilitating the data collection exercise.

A sample of 84 farmers was purposively selected, spread over five Wards and three sub-counties, namely Njoro Ward in Njoro Sub-county; Menengai West, Mosop, and Soin Wards in Rongai Sub-county, and Elburgon Ward in Molo Sub-County (Table 1).

Data collection and analysis. Data were collected through face to face researcher - administered questionnaires to farmers composed of both open and close ended questions, key informant interviews and focus group discussions for community leaders and extension officers. Interviews and focus group discussions were for triangulation purposes, and to shed more light on the farmer contexts. Local community leaders and extension officers from each Ward also assisted in directing researchers to the identified respondents and in the facilitation of the data collection exercise, through mobilisation and translations where needed. Data were analysed using Chi Square Tests and thematically for key informant interview data.

RESULTS AND DISCUSSION

Characteristics of the university-community engagements. The characteristics of Egerton University-community engagements that the respondents had participated in terms of their nature, number of times farmers had engaged with the university, and topics covered are presented in the narrative and illustrations below. Typically, these university-community engagements were facilitated by students, based on the university semester cycles such that a new set of students engaged with the

TABLE 1. Distribution of research respondents within the sub-counties and Wards covered by Egerton University outreach programmes in Kenya

Sub County	Ward	Frequency	Percent
Njoro	Njoro	13	15.5
Rongai	Menengai West	20	23.8
Rongai	Mosop	33	39.3
Rongai	Soin	12	14.3
Molo	Elburgon	6	7.2
	Total	84	100

farmers each semester with no continuance of the previous engagement activities. Consequently, each new semester presented a new cycle of engagement consisting of identification of issues of concern using community needs-based approach, prioritisation of issues, selection of issues to be tackled, planning of interventions, implementation of action and monitoring of the implementation process.

Efforts were made to include farmers in every stage of this process, key among them being needs identification, learning and outreach sessions, and community contributions towards community based projects. However, in a few cases and where resources allowed, selection of issues to be tackled and the planning of intervention were done at the university by students under the guidance of their supervisors. Regarding the number of times respondents participated in Egerton University outreach activities, on average, farmers engaged with the university four times between 2011 and 2016, with a minimum of one and maximum of ten times (Fig. 1).

Recurrent participation in outreach activities may signify the level of importance participants accorded to such activities. When asked what motivated them to participate in outreach activities, almost all reverberated acquisition of new knowledge and skills. Participation, therefore, was a personal decision though motivation by extension agents and the area chiefs, who was also cited by 31% of the respondents as having contributed to their participation. Other reasons were curiosity of interacting with and learning from university students, cited by about 50% of the respondents. Networking opportunity was cited by only 1.2% of the respondents (Table 2).

Mean = 4.13
Std. Dev. = 2.692
N = 84

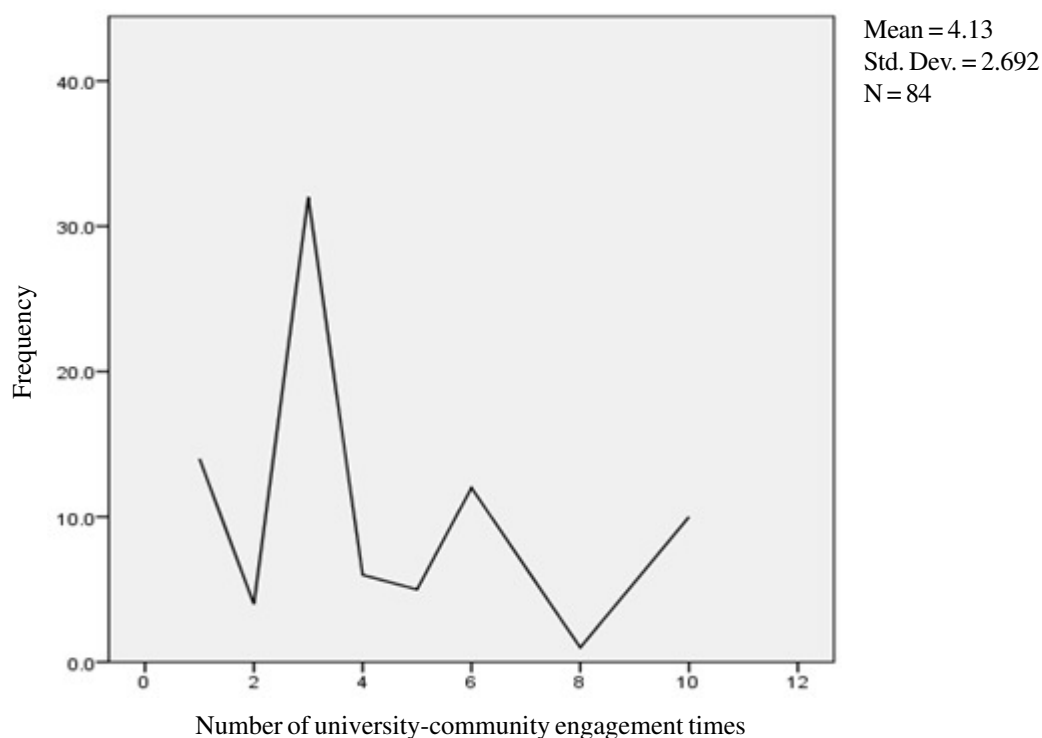Number of university-community engagement times

Figure 1. Frequency of farmer engagement with the Egerton University's outreach activities during 2011 - 2016.

These engagements were majorly conducted in pre-existing farmer groups settings, with membership cutting across villages. The groups were also open to farmers of all gender groups and ages. A dismal proportion of respondents (4%) participated in individualised outreach sessions only, mainly through community-based participatory research projects (Table 3).

Since Egerton University community engagement activities were based on identified community needs, the topics covered were requested for by the targeted community. As such, several topics were covered between 2011 and 2016; many of them being agriculture-oriented as reported by the farmers who participated in them (Fig. 2).

These topics can be categorised broadly into seven areas of (i) crop production covering good crop husbandry practices, improved seed

TABLE 2. Reasons for participating in Egerton University's outreach activities by farmers in Nakuru County, in Kenya, during 2011-2016

Reason	Percent
Gain new knowledge/skill	98.8
Curiosity	60.2
Urged by extension officer	28.9
Urged by area chief	2.4
Networking opportunity	1.2

TABLE 3. Nature of engagement in Egerton University's outreach programmes in Nakuru County in Kenya during 2011-2016

	Frequency	Percent
Group training	50	61
Individualised training	3	4
Both (group abd individualised)	29	35
Total	82	100

and planting material and soil testing; (ii) livestock production that included dairy farming, poultry keeping, silage making, and animal disease management; (iii) environmental conservation that covered tree planting, garbage management and prevention of soil erosion; and (iv) agribusiness which included record keeping and farm planning, value addition on farm produce e.g. yoghurt making, crisps making and other snacks, and cake baking. Others included (v) non-farm income generating activities for example making and selling non-food products e.g. shoe polish, floor and table mats, detergents and laundry whiteners and bleaches, and simple record keeping for small businesses; (vi) family dynamics which covered domestic violence, divorce, communication in the home, and parenting and handling of children; and finally (vii) nutrition and health issues including disease prevention and management, good nutritional practices, feeding vulnerable members of society e.g. pregnant and breast feeding mothers, under-fives, the aged and the sick, weight management, and drugs and substance abuse.

Almost all farmers participated in learning dairy farming and good agricultural practices, understandably due to agriculture being the main stay of Nakuru County economy (Willkomm *et al.*, 2019). This might be because adult learners tend to participate in activities selectively and their learning is problem-centred (Cercone, 2008; Caffarella and Daffron, 2013).

Farmer-preferred learning methods. Six farmer-preferred learning methods were identified among those used by Egerton University's outreach programmes (Fig. 2); with demonstrations plots being the most preferred (89.3% of the respondents). This was followed by lectures and group discussions, each cited by 51.2%. Touring farmer model farms was the least preferred method (cited by only 1.2% of all those studied). The main teaching methods utilised

during Egerton University community engagement activities were identified as demonstrations, group discussions and lectures. Others were training videos, and touring model farms, both farmer and Egerton University farms (Fig. 3). The Community–University partnership provided an opportunity for community based learning experience.

Learner centred methods such as demonstrations are effective means of sharing knowledge and skills (Cletzer *et al.,* 2016). They are designed to take new innovations out of the scientific realms of higher learning and research institutions, and place them firmly within the bounds of a farmer's everyday experience (Ingram *et al*, 2018). The methods
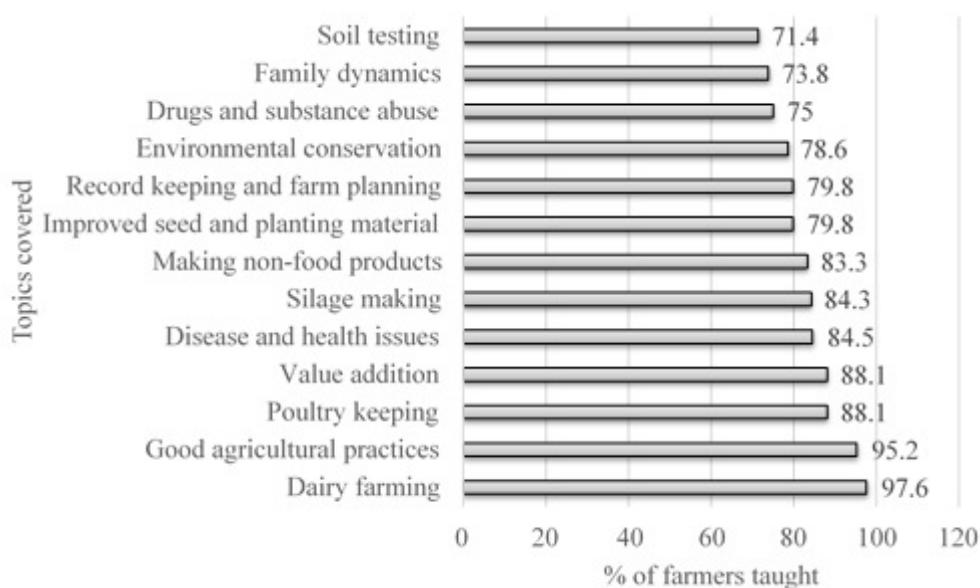
Figure 2. Topics covered during Egerton University's outreach activities in Nakuru County in Kenya during 2011-2016.

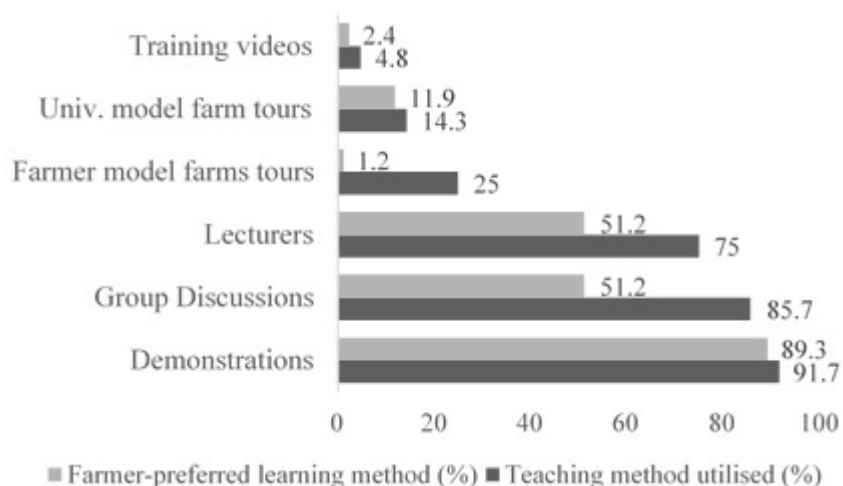■ Farmer-preferred learning method (%) ■ Teaching method utilised (%)

Figure 3. Farmer-preferred learning methods *versus* teaching methods used by Egerton University's outreach programmes in Kenya during 2011-2016.

utilised by Egerton University were similar to those preferred by the farmers aimed not only for communication of knowledge and skills, but also to provide stimulation for behaviour change.

Chi Square test of the association between farmer-preferred learning methods and teaching methods utilised during outreach programme activities, revealed statistical significance for the demonstration method, touring Egerton University model farms and use of training videos (Table 4). This means that majority of famers who reported utilisation of these methods for teaching also preferred them for learning. However, no significant relationships were noted for group discussions, lectures, and touring farmer model farms (Table 4).

Research has shown that learning takes place through four major modes, namely concrete experience, reflective observation, abstract conceptualisation and active experimentation, with learners leaning towards some modes more than others (Gülbahar and Alper, 2011). Adult learners prefer achievement-oriented learning situations that utilise active approaches designed to integrate learning with their own experiences (Stevens, 2014). Therefore, teaching styles that reproduce this kind of experience augur well with adult learners. This explains the popularity of demonstrations as a teaching and learning method of Egerton University; stemming from

its capacity to facilitate understanding of theory applications through connecting theories to actual practice (Basheer *et al.,* 2017).

Demonstrations utilise several senses, namely sight, hearing and touch, and learners have the opportunity to experience actual events as they try out the processes (Umar *et al.*, 2014). Hence, it is imperative that Egerton University's outreach programmes strengthen their capacity to deliver effective learner (farmer) centred approaches in order to realise meaningful long term impacts in community livelihood and well being.

Training videos (4.8%) and touring Egerton University model farms (14.3%) were utilised to teach just a small proportion of the farmers, owing to the high level of financial investment required in production and operationalisation of these outreach options. Small scale farmers may not afford to pay for trips to visit the University model farms; while developing contextualised and appropriate training videos requires heavy investment in terms of expertise, funding and time. However, Access Agriculture, an international Non-Governmental Organisation was then collaborating with the University to develop farmer-to-farmer training videos as well as sponsoring members of staff to develop this valuable expertise. In addition, farmer training videos translated into different languages can be downloaded for free from the NGO's website: www.accessagriculture.org.

TABLE 4. Chi Square Test for farmer-preferred learning methods and Egerton University's outreach teaching methods in Nakuru County, Kenya during 2011–2016

Teaching/Learning method	Chi-Square value (χ^2)	P-value
Demonstrations	17.21**	0
Group discussions	0.01	0.93
Lectures	0.51	0.48
Training videos	40.98**	0
Touring Egerton Univ. model farms	68.11**	0
Touring farmer model farms	3.04	0.08

N = 84, df = 1

TABLE 5. Chi Square Test for topic and preference for group discussion learning method among groups participating in Egerton University's outreach programmes in Kenya during 2011–2016

Topic	Chi-Square value (χ^2)	P-value
Dairy farming	.001	.973
Good agricultural practices	4.405	.036*
Poultry keeping	.006	.936
Value addition	.006	.936
Disease and health issues	.043	.835
Silage making	7.648	.006**
Making non-food products	1.153	.283
Improved seed and planting material	2.156	.142
Record keeping and farm planning	2.156	.142
Environmental conservation	5.026	.025*
Drugs and substance abuse	.778	.378
Family dynamics	.017	.897
Soil testing	9.224	.002**

N = 84, df = 1

Videos are powerful tools for learning due to, not only the engagement of audio and visual faculties of the viewer, but also the capacity for demonstration and observation of the body language of the presenter which are important for enhancing communication, and therefore, understanding of the subject of concern (Asasira *et al*., 2019). Technology has always been part of the teaching and learning environment, increasingly becoming essential in today's extension delivery in designing meaningful learning experiences and outcome; thus an area Egerton University must increasingly explore and invest in. Most farmers had preference for group discussions as a learning method, possibly because this teaching method is based on its capacity to facilitate collaborative or cooperative learning. It is argued that groups achieve more than individuals working on their own (Stenlund *et al*., 2017).

A further investigation through interviews and focus group discussion point to inability of students to facilitate stimulating group discussions among farmers. However, when Chi Square tests were performed to investigation relation between topic and preference for group discussion as a learning method, significant relations were noted for some topics as illustrated in Table 5.

CONCLUSION

Demonstrations, group discussions and lectures are the most utilised methods of teaching. Similarly, they are the most preferred learning method by farmers. Such learner (farmer) centred teaching methods with the capacity to facilitate collaborative or cooperative learning should be enhanced by Egerton University. This can be done through a multi-faceted institutional based approach through the operationalisation and execution of the community engagement policy framework, infrastructural development and allocation of finances. Use of other methods such as farmer training videos and visiting university model farms by Egerton University need to be encouraged as teaching methods due to farmer preferences of them.

With organisations such as Access Agriculture offering free access to quality training videos, students and University faculty need sensitisation on their use for teaching to

increase its utilisation as a teaching method. University community engagement within the context of service learning provides students with opportunities for experiential learning and for universities to contribute towards societal needs and aspiration through aligning university teaching to societal needs. Therefore, students' capacity to organise and facilitate inspiring topic-specific group discussions need to be developed in an effort to increase options of teaching methods that would allow for blended experientially oriented methods that support selective, reflective, self-directed and problem-centred learning characteristic of adult learning.

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