ADOPTION OF VIRTUAL LEARNING ENVIRONMENT TO ENHANCE TRAINING OF AGRIBUSINESS PRACTITIONERS IN KENYA: A REVIEW

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ABSTRACT

In recent times, Kenya has seen an upsurge in young people interested in commercial agriculture. Some of these agripreneurs have training in agricultures but majority are in other fields yet practicing farming as an additional income earning activity. Effective farming requires knowledge. The traditional popular approach of acquiring knowledge is that of sitting in a formal classroom setup with a physically present trainer delivering the education contents. Other traditional approaches include attending workshop, seminars and bazaars; informal face to face sharing and reading hard copy educational materials like books, magazines, journal articles among others. Taking into consideration the nature of the modern agriculture practitioner; a busy yet technosavy interested farmer, training could take advantage of technology and technological innovations for the enhancement of the education process. This paper reviews the use of computer technology in enhancing agricultural trainings.

KEYWORDS: Agriculture, Agribusiness, Agripreneurs, Computers, Virtual Learning Environment, Computer Assisted Learning, Computer Aided Instructions

INTRODUCTION

Agriculture plays a key role in the achievement of the economic development of countries. Globally farmers are the majority food basket providers. This role has been identified by the international community which has captured the importance of agriculture in the sustainable development goals. The UN led initiatives recognize agriculture through Goals 2 and 13 of the SDGs; of which Goal 2 focuses on initiatives to "End hunger, achieve food security and improved nutrition and promote sustainable agriculture" while Goal 13 focuses on initiatives to "Take urgent action to combat climate change and its impacts". To combat climate change, a wholesome approach is suggested; one that seeks to impart on farmers, herders, fishers and foresters with the ability to understand local climate impacts and vulnerability, which determine planting cycles and other management interventions and which in return effect climate change in a positive way.

Locally, The Government of Kenya has also identified agriculture as a positive contributor to the economy of the country. The economic pillar of the Kenya Vision 2030 (Kenya's development blueprint) recognizes agriculture as a factor to enhance economic development. Agriculture contributes 24% of the Gross Domestic Product (GDP) and accounts for 80% of national employment mainly in the rural areas. 45% of the government revenue come from agriculture. Agriculture too brings about 60% of the total export earnings (KARI Food Security Report,).

In recent times, Kenya has seen an upsurge of interest in Agribusiness. Agribusiness is where agriculture is practiced for commercial purposes. One factor encouraging this is the increase in number of young graduates; while on the other hand there is a reduction in white collar jobs able to offer traditional employment to all. Young people are considering venturing into agricultural practices to earn a living. Another causative factor may be due to retirement where we have people still in the prime of their age, yet considered too old for formal employment retiring and them in turn turning to other ventures including considering agricultural practice post retirement. A third factor is what can be termed as modern initiatives. In Kenya we have seen an emergence of the likes of offsite farming where one pays for a management company to plant and manage crops and the owner is given some cash after some predetermined period.

A number of such agripreneurs have no formal knowledge on farming. However, there cannot be said to be a lack of farming information. As a response to Kenya Vision 2030 and SDGs, researchers are coming up with new techniques and approaches for agricultural practices. Universities and colleges are offering training on agricultures, there exits field extension officers' employees of government and research institutions who traditionally play an important role in addressing farmer concerns. The thirst for farming knowledge has led to initiatives such as TV Programmes Shamba Shapeup aired by Citizen TV Kenya, Seeds of Gold which is a pullout of the Saturday Nation, as sister weekly of the Daily Nation Newspaper in Kenya. Social media groups such as a famous Facebook group "African Farmers Club" where agripreneurs meet virtually to share ideas on farming and related views. This demand for knowledge has also seen emergence of apps focused on farmers and farming activities by computer innovators. Of interest too is the Government's investment in technology. An example is the Optic fiber project namely TEAMS (The East African Marine System) which is an iniative by the government of

Kenya to link the country to the rest of the world through a submarine fiber optic cable. The fiber optic platform has provided a fast, reliable and safe interface through which training models like ODEL (Open, Distance and Electronic Learning) are implemented.

FARMING KNOWLEDGE

We consider a number of approaches available for gaining farming knowledge.

Classroom Learning Environment

From a learning perspective, the traditional way of acquiring knowledge is to register for a course and physically attend the course, take tests and be graded for a certificate to be awarded. The other traditional approach has been that of obtaining a physical reading material like a book, journal article etc. and read to acquire knowledge. This is known as the Classroom Learning Environment (CLE). It is the traditional knowledge passing approach where the learner sits in a classroom setup and the teacher passes knowledge through mechanism including chalk and board as well as hard copy notes which students can photocopy. At times this mode does include computer technologies like use of PowerPoint presentations over overhead projectors and sharing soft copy notes of learning material through email or even a peer to peer file sharing software. Edwards et al., (2001) notes that lecturing is such a method like used in a college setup. This is a good learning approach because the learner has immediate physical contact with the educator meaning that any learning concerns can be easily handled face to face. However the nature of the modern farmer calls for more innovative approaches. The modern farmer may be a multi hustler who may not really have time to attend physical classes at planned sessions. He may be in formal employment participating in farming as a part time endeavor. The modern farmer is a tech savvy farmer. Computers in their different types have become cheap and available. Almost everyone has access to a phone, some basic ones and others advanced with lots of features and power. Educating farmers could as well take advantage of the availed technologies.

Digital Media as a learning tool

Advances in technology have introduced what is known as digital media. These include all contents created, stored, manipulated and distributed over computers and computer networks. Inclusion of rich content like text, imagery, video, animations and audio technology is part of this. Education content could utilize such technologies through content such as electronic mail, electronic books (eBooks), web logs (Blogs), discussion forums, chat rooms, digital audio and digital video among others. When utilized for learning this is collectively referred to as either Computer Aided Instructions (CAI) or Virtual Learning Environments (VLE) also known as Learning Management Systems.

Computer Assisted Learning

Computer Assisted Learning (CAL) otherwise known as Computer Aided Instruction (CAI) or Computer Assisted Instructions is a virtual learning approach whereby learning is through a computer programmed instruction environment in either an offline or an online mode. Computers are therefore used not only to avail the instructional material but also to monitor the

learning process. Such an approach is used by some institution to provide what is commonly known as eLearning or digital learning. Learners are provided with a computer device e.g. a laptop computer or a tablet preloaded with learning modules and assessment programs. The learner may at times have limited contact with but other times purely no physical contact with the module trainer. This mode of learning is gaining foot as it is convenient for mature learners who may not be in position to free time for class room learning which requires direct access to trainers. One example of this learning approach is presented below. Cebeci and Tekdal (2006) consider the use of Podcast as a Learning object. Podcast deriving its name from Apple's iPod is a media where audio or video recording is captured and presented as episodic audio or video files for use in mobile devices and other computer platform. According to the researchers a trainer can create a podcast as a live recording of a lecture; then learners can download it to a mobile player and be listened to at the learner's convenience. Podcast brings about learning through listening which may motivate students who do not like reading; podcasts can also be an added education tool to benefit the visually challenged, Oliver (2009) examines the possible influence of podcasting on the traditional lecture in higher education. He identifies the podcast as a technology that can be used to provide recordings of past lectures to students for review, revision, provide additional material in form of study guides and summary notes as well as providing substitute materials to deepen a student's understanding. The researcher observes that Podcasting can be used as a substitute to the traditional lecture where students can access an entire recording of the lecture; to provide supplementary material to assist learning.

However admirable this mode of learning is; Zhang, Watson and Banfiled (2007) note that CAI fails in that it does not avail the communication and collaboration between learners and trainers, or between learners themselves which is a necessary component of a successful learning environment.
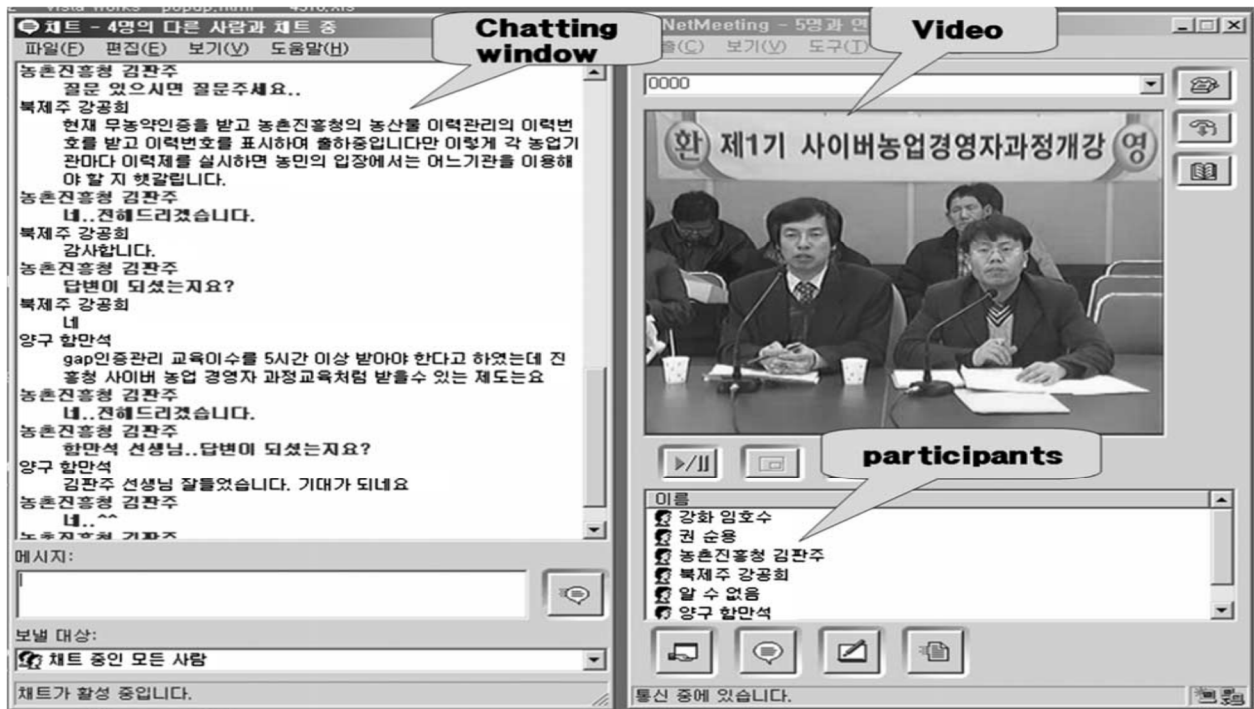
Virtual Learning Environment (VLE)

Sneha and Nagaraja (2013*)* defines a Virtual Learning Environment (VLE) as a system for transferring learning materials to students by means of the web. These systems constitute student tracking, communication tools, assessment and collaboration. They can be accessed both on and off-campus*.* Weller (2007) defines a virtual learning environment (VLE) as a software system designed to support teaching and learning. A VLE typically provides tools such as those for assessment, communication, uploading of content, return of students' work, administration of student groups, questionnaires, tracking tools, wikis, blogs, chats, forums, etc. over internet. Learning Management Systems allow implementing objects of many kinds such as: videos, mp3s, text documents, scanned images, links to other web sites or animations which can be used to show dynamically many physical situations and concepts enhancing the learning experience. Virtual Learning Environments are usually implemented through what are commonly known as Learning Management Systems (LMS). We consider some of the applications of VLEs as training platforms.

Park, Choo and Lee (2007) examine the e-learning system of the Computer-Based Agricultural Extension Program (CBAES) in Rural Development Administration (RAD). The system integrates a Web-based system, which has a videoconferencing system that provides more

interaction between educators and farmers. The video-conferencing system allows face to face telecommunication: the users can see and listen to each other. CBAES acts as a distance education and consulting system for the farmers. Through this system, farmers can face specialists on visual-image contact to consult and obtain information at the comfort of their own local extension institute and farm. Farmers can also see and listen to each other enhancing the learning experience. RDA launched CBAES in 2003. During its first year of operation, the e-learning course included subjects on cucumber, pepper, and tomato. Each course included general topics such as farm management and pest control. A total of 126 out of 251 farmers completed the course. In 2004, the course expanded to include mushroom, watermelon, and strawberry. During this year, a total of 647 out of 1,056 farmers completed the course. In 2005, the course also added subjects on apple, pear, and mum. A total of 818 out of 1,872 enrolled farmers completed the course. A graphical user interface of the platform is presented below:
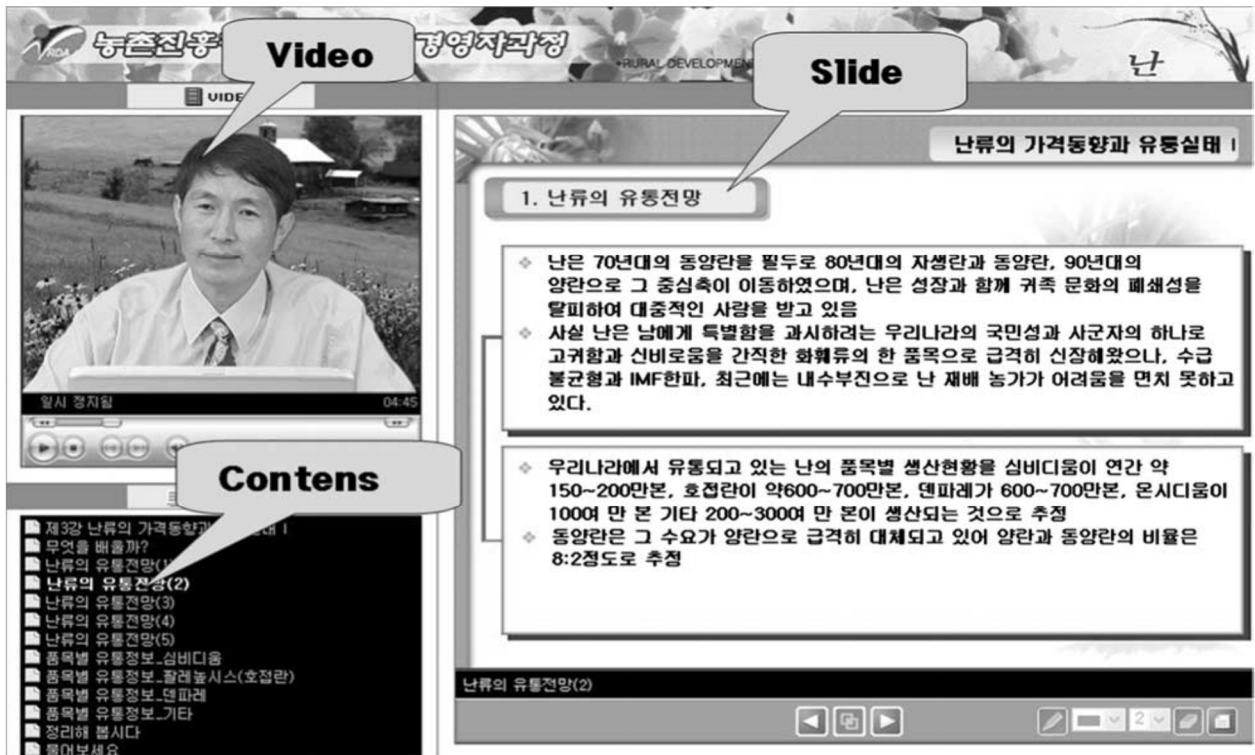
CBAES user interface: synchronous learning: Park, Choo and Lee (2007)

A Greenhouse Horticultural Course in a Virtual World is presented by Rhoades et al. (2009). The researchers assesses the effectiveness of a multimedia-based learning environment utilized in a traditional classroom through a collaborative project involving five greenhouse agriscience courses. The motivation was that greenhouse training is highly visual and traditionally this is done through hands-on application in the field and in greenhouses, which can be expensive to maintain. To counter the high maintenance cost yet gain on knowhow, the research considered the approach of creating visual image databases and simulation of the greenhouse environment utilized by students to replicate the conditions in an actual greenhouse. Collaborators at five universities in the U.S. utilized a multimedia approach to create a course taught at each of the universities in a one-year period. Course material, a digital repository of images and materials for learning purposes as well as a simulated environment were created using Macromedia Flash. Discussion of the results show that overall students were satisfied with the course content and delivery methods.

Langin, Ackerman and Lewark (2004) present a set of Internet based online courses initially developed at the Institute of Soil Science and Forest Nutrition, Faculty of Forest and Environmental Sciences, University of Freiburg, Germany. Course units are based on HTML, using graphics, complex animations and interactive exercises. Courses within Forest Ecology Online range from soil science and forest botany to biometrics. Forest Ecology Online uses the open-source content management system ILIAS.

A Modular E-Learning Environment to Teach GIS to On-Campus and Distance Education Students is provided by Grunwald, Ramasundaram and Jesseman (2005). A view of this platform is presented below:

Martín-Blas and Serrano-Fernández (2008) consider the use of a popular LMS namely Moodle as a teaching tool in Physics. Universidad Politécnica de Madrid has placed at lecturers' disposal the Moodle platform to develop online courses proposed as a complement to the classroom lessons. In Moodle course materials can be developed with ease and refined in an iterative fashion (Berggren et al., 2005). Martin-Blas and Serrano-Fernandez (2008) through their study evaluates the effectiveness of delivering the core curriculum of an introductory neuroscience course using a software application referred to as a virtual learning interlace (VLI). The VLI utilizes audio, video, animation, and text in a multimedia computer environment. Results from the research show that average scores on weekly examinations were 14 percentage points higher for students in the VLE compared with those for students in a conventional lecture hall setting. Also normal test scores were over 5 points higher for students in the VLE. The researchers conclude that a core curriculum can be effectively presented to students using the VLE, thereby making it possible for faculty to spend less class time relaying facts and more time engaging students in discussion of scientific theory. Goldberg and McKhann (2000).

A case study is the San Francisco State University (SFSU), where over 70% of all courses use online technologies (Beatty & Ulasewicz, 2006).

Martin (2008) presented Blackboard Learning Management System to teach a Computer Literary course. Deb (2011) notes that distance learning could be effectively done in developing countries using mobile and multimedia technology

Classes of VLEs

Access to Virtual Learning Environment of choice could take any of the following forms:

i. Purchase of an off-the-shelf VLE such as Blackboard and WebCT
ii. The use of open source VLE which are usually free to use and adapt either with paid or not paid support such as Moodle
iii. Use of Bespoke VLE where an institution may decide to create their very own VLE as per individual needs.

We consider a common open source (Moodle) as an example to show features of interest.

USE OF MOODLE AS A VLE / LMS

Being an open source platform, Moodle is a widely used VLE. A quick survey of Moodle as a Learning Management platform shows the following offerings:

a) It provides a Chat room where students can collaborate and communicate with their peers and trainers too

b) Practice Topics – A provision using Microsoft Word for what are known as activities. A trainer can note down ideas to brainstorm on before starting the actual training.

c) Moodle Platform- More detailed technical explanations; include pop ups e.g. the leaf in Module; topics popping up via pop-up menus; Images- very dynamic. Student can track progress of topics covered

d) Pdf- More detailed technical explanations; Primarily text and images--- static

e) PowerPoint slides- Trainers can use the provision to create at glance summary of the training

f) Video Tapes / Audio Tapes- The platform allows uploading of audio files and videos where trainers can be recorded teaching and demonstrating the process.

g) Evaluation- Moodle provides a place where trainers can avail a place where students can be activities at the end… A kind of a quiz to help gauge students grasp of what has been studied; applies gamification

VLE AS A TRAINING PLATFORM FOR AGRIPRENEURS

As seen from discussed examples, Virtual Life Environment has been identified as a powerful approach for education provision. Training on agriculture can as well adapt to this kind of training. Adoption of VLEs by those responsible for educating on agricultures can reach a wider mass with more interesting and real life material. A video taken of a researcher carrying out an agricultural task if combined with audio too has a greater impact on the learner than reading from

hard copy material. Through devices, moreso handheld devices such as Smart phones and notebook computers, agripreneurs can access learning materials, collaborate with like-minded colleagues and even communicate with trainers on the fly. The face of the modern Kenyan farmer is a techno savvy youth, ready to farm leveraging on the strengths of technology.

Challenges Facing Adoption of VLEs as a Tool for Training Agricultures

▶ Lack of awareness- not knowing that these technologies exists and the power / impact they can avail

▶ Disconnect between Computer Scientists and Agriculturalists; joint research initiatives are necessary

▶ Investments in platform and technology: Some VLEs / LMSs are commercial while others are open source. But all need right equipment, trained personnel for setup, maintenance and support

▶ Content preparation- deliberate preparation of content is needed to present up to date learning content; content cannot be obsolete because it is under the scrutiny of many

▶ Security issues- cybercrime- hacking, identity thieves; copyright infringement

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