

# Using e-learning to aid technical uptake of goat-based technologies by small livestock producers in the Philippines

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**Abstract.** The improvement of goat raising in the Philippines by achieving a stable supply of good quality breeders and highly uniform slaughter goats by 2020 is the aim of an Industry Strategic Plan. While a number of ways of promoting science-based technology have been offered to farmers, countless small to medium-scale farmers are almost impossible to reach. Online FLS or e-learning courses on goats have been developed where learners can take the courses from any place, at their own pace, and in their own convenient time. Internet cafes are available throughout the Philippines, where goat raisers are able to access the e-learning, as well as many homes and offices are equipped with wifi, facilitating access. Although no formal impact evaluation of the effect of the courses on the lives of these learners has been done to date, the emails and messages of the graduates to the development team can attest to the fit of the topics and their satisfaction over the courses.

**Keywords:** e-learning, courseware, goat, PCAARD, Philippines.

## Introduction

In the Philippines, goat raising is an integral part of farming with about 1.4 million Filipinos depending on goats for their livelihood (Yanzon, 2012).

### *Poor industry performance*

Although it has been part of the Philippine landscape since time immemorial, the goat industry remains small at approximately 3.7 M head (BAS 2013), 98% of which are with backyard raisers. Productivity is generally low, with the dam having long production cycles and low conception rates and the kids having high pre-weaning mortalities and low slaughter weights. This is partly because raisers lack proper knowledge on goat nutrition and husbandry.

### *Current hype*

To elevate goat keeping into a science, PCAARRD in 2006 laid down an Industry Strategic Plan designed to achieve a stable supply of good quality breeders and highly uniform slaughter goats by 2020. Extension programs promoted the goat as a viable business option with the private sector taking an active role. Over time, goat production has emerged as a popular business undertaking not just for rural households but now also for many affluent entrepreneurs.

To increase the goat inventory, various ways of promoting science-based technology were offered by PCAARRD-DOST as well as by the Department of Agriculture. One notable project was the Farmer Livestock School (FLS) on Integrated Goat Management (now called FLS-Goat Enterprise Management), which is a six month-

long modality designed by AMPalo of PCARRD in 2002 and adopted as full blown program by the local government units (LGUs) specifically in Regions 1 (Ilocos Region) and 3 (Central Luzon), both in Northern Philippines. This initiative has helped produce over the years a significant increase in the inventory of goats enabling both Regions 1 and 3 to figure prominently in the Bureau of Agricultural Statistics' top 10 goat producing regions in the country (BAS 2013).

### *Opportunities for using e-learning*

As countless other small to medium-scale farmers are almost impossible to reach, another modality was offered. This is the online FLS or the e-learning courses on goat. These are self-paced interactive online certificate courses intended to train geographically dispersed raisers who have no access to the 6-month FLS but have access to the Internet. This initiative is part of a collaborative program with the Department of Agriculture on e-learning for Agriculture and Fisheries that seeks to unify all efforts on agricultural e-extension using the Agricultural Training Institute (ATI) as the hub. At the moment, these e-learning courses on goats, along with other courses offered at the main e-learning portal, are exclusively available to Filipinos residing in the Philippines and Overseas Filipino Workers. Once enrolled, learners can take the courses from any place, at their own pace, and in their own convenient time. Five categories are currently being offered at the site maintained by ATI: crops, livestock and poultry, fisheries, sustainable agriculture and social technology. All the online courses in the site are SCORM compliant, *i.e.*, "Sharable

Content Object Reference Model”, the *de facto* industry standard for interoperability between e-learning softwares.

## Methods

### *Courseware development*

The development of the e-learning courses was in accordance with the rapid e-learning processes framework set up by DA-ATI.

For the courses on goats, two of the original developers of the FLS-IGM, who were experts from two State Universities, were engaged to serve as subject matter specialists for the e-learning on goat production, feeding methods, forage agronomy and health issues.

### *Re-purposing FLS into a virtual school*

In 2007, the Lead FLS developer, AMPALO, was trained to be an e-learning courseware developer by DA-ATI. FLS-IGM topics were then screened to form the course entitled, Building Assets Thru Goats for delivery via the Internet. Initially only 2 courses were planned. The first course, ‘Establishing a Slaughter Goat Enterprise’, was meant to help new raisers jumpstart their businesses while the second on ‘Improving Traditional Goat Management’ was designed for established raisers, to provide them with options to enhance their current farm enterprises. During its pilot run, however, both courses were found to be too heavy for the users which meant that breaking them further into sub-courses was an imperative. Hence, six courses were eventually developed, namely: Establishing feed resources for goats (Course 1); Starting a slaughter goat enterprise (Course 2); Alternatives to traditional care and management (Course 3); Alternatives to traditional goat feeding (Course 4); Alternatives to traditional health management (Course 5); and Alternatives to traditional breeding management (Course 6).

### *Content creation*

After the topics had been set, the courseware developer started work based on a recommended instructional design. The subject matter specialists were tasked to write the fundamental materials while the Lead FLS developer transformed them into pre-SCORM course materials. Topics were thus restructured into modules, lessons, and sub-lessons and FLS field activities were redesigned to fit the e-learning environment. The subject matter specialists then verified the technical content. After which, DA-ATI modified and enhanced these materials into SCORM-compliant coursewares and submitted them to a Quality Circle for critiquing form and content.

### *SCORM Authoring*

This stage assembled the course into how it shall be available online. It was at this stage that rich media (picture, videos, animation) and interactivity were integrated by the courseware developer with the main technical content of the course. This stage also brought in the expertise of a graphic artist from PCAARRD who did some of the animated graphics.

The e-learning courses were uniformly structured to avoid much deviation from manuals and handbooks of

traditional training. In this manner, confusion was kept to a minimum should a regular training participant try to take the course online. The main difference was instead of a full course test, there were corresponding End of Module Tests (EOM) that were automatically aggregated at the end. The functional design of the main e-learning content also considered users who have less than average computer knowledge. Hence, there is minimal use of the keyboard; it is only used when logging in. The main site in fact is “first-time-user aware”, where users can be registered without the need for an active email address.

### *Courseware testing and modifications*

After the initial packaging of the courseware, it was subjected to a quick pre-test and corresponding modifications were put in place.

### *Course delivery*

e-Learning here does not attempt to replace effective face-to-face training. It provides, however, a convenient alternative and complement to traditional training. The courses were delivered in rolling mode, continuously available year-round. This means that anybody can start his own sessions in the course even if the others are half-way through. This mode addresses the need for making a training course continuously available. It essentially solves the problem previously experienced when farmers with high readiness level were turned down because either the particular training has been finished or was not yet due to start.

### *Promotion of e-learning*

The e-learning courses on goats were initially promoted through the help of the Federation of Goat and Sheep Producers and Associations of the Philippines, Inc. (FGASPAPI). Teasers and invitations were posted in their e-group page by the courseware developer and all who responded were contacted individually by email and guided in enrolling in the courses. The e-courses were also promoted by PCAARRD during agricultural fairs and during technology fora of the state colleges and universities (SUCs).

ATI, on the other hand promoted the goat courses along with the other courses via its own training programs and activities as well as that of the Department of Agriculture. One of the principal means for promoting e-learning was, ironically, through face-to-face briefings and orientations. In all ATI trainings, a session on e-learning was included to introduce to farmers and participants the learning options with technology. Similarly, e-learning was mentioned and promoted in ATI’s Schools on the Air (radio) programs across the country and during the provincial sorties of the information caravans on new program thrusts of the government. ATI of course maintains its presence in the social network.

### *Learners’ access points*

As Internet cafes are available even in the countryside, goat raisers were thus able to access the e-learning there. Many homes and offices were also equipped with wifi, hence access was facilitated.

### Course evaluation

The e-learning makes use of a Learning Management System that deploys the online courses, tracks learner use and progress and automatically computes scores of the End of Module tests. The system allows the farmers to know whether they passed the course or not immediately after taking the tests.

While the system generates the data, non-machine based monitoring is conducted at regular intervals by a tech-support team from the Farmers' Contact Center at DA-ATI. At any time, a user can contact the subject matter specialist, or courseware developer, if he has more queries. Communication can be through the built-in private messaging feature, where a copy is sent through email, or through the Farmers' Contact Centre.

## Results

### Current course offerings

Currently there are three rolling online courses on goats and three more are in different finalization stages. The first two courses on *Establishing feed resources for goats* (Course 1) and *Starting a slaughter goat enterprise* (Course 2) have been offered since 2008. The third course, *Alternatives to traditional goat feeding*, has been uploaded only in 2012.

### Enrollees and graduates

As of the first quarter of 2013, a total of 711 have enrolled in the first 2 courses, 67% (478) of which have graduated (Table 1). Of the 711 enrollees, 34.5% were extensionists, 21.6% farmers, 14% businessmen, and 10% overseas Filipino workers.

### Reasons for enrolling in e-learning

The basic reason of all enrollees were to gain or enhance knowledge on goat production either to prepare them for their new business undertaking or to address an existing problem in the farm, especially mortalities. Aside from these, some learners who had no formal training on goat production, would like to validate information read in the Internet.

### Technologies found useful

Based on the post-course phone-in and emailed assessments made by e-learning graduates, the topics most useful to them were those on forage establishment, confinement and stall feeding.

It can be noted in their testimonies that many of them had incurred around 50% herd mortalities prior to their enrollment in the online courses. They had very little

knowledge on the production and reproduction aspects, as they just mimicked the way their forefathers raised goats. Their goats were let loose and free to graze even during the wet months and their pens were not suited to the rainy weather in their regions. Although most of them were able to initially increase their stocks, they usually ended up with half their stocks dead. Moreover, their pastures were not always enough to sustain the surviving stocks.

Fortunately, there were a few local seminars given either by the local Department of Agriculture or the goat raisers' federation (FGASPAPI) as well as information in the web, which helped some to continue their goat production.

### Technological changes after elearning

One notable immediate effect of the e-learning courses on the graduates was the shift in production system. Almost all were into free grazing before with very few having good pens. This caused most of the mortalities they incurred in the past. The course helped them construct elevated pens with provisions for kidding and adopted confinement and stallfeeding practices. Almost all began establishing additional forage gardens consisting of *rensonii*, *flemingia*, *caliandra*, *napier* and/or *leucaena*, as the online course identified where they can source their seeds and seedlings. As the courses showed them images of trees, forages, concentrates, and crop residues that can be fed to goats, they were able to provide the variety of feeds that goats require. Although no formal full-blown impact evaluation has been done so far, it can be gleaned from those who still interact with the courseware developer up to this day that goat production has been pursued by most who graduated from the e-learning courses and has grown in number.

### Client satisfaction

Initial evaluation as well as emailed reactions and comments received by both PCAARRD and the course administrator at DA-ATI show that elearners enjoyed the courses offered. In a scale of 1-10, with 10 as the most favorable, overall acceptance of the courses was 9. Satisfaction over services provided as well as the courses' ability to sustain interest were rated 5 (scale of 1-5, 5 highest). These ratings may be due to the highly favorable assessment of the following factors:

- **Entertainment:** the courses were rich in multi-media such as pictures, videos and animated graphics that kept the learners entertained while learning.
- **Interaction:** the learners can post questions to the developer or administrator and get immediate feedback. There are also activities embedded that learners can try in their farm thus encouraging active learning.

**Table 1. No. of enrollees vis-à-vis graduates per year per course**

Courses	2008		2009		2010		2011		2012		Total	
	Enrol	Grads	Enrol	Grads	Enrol	Grads	Enrol	Grads	Enrol	Grads	Enrol	Grads
Establishing feed resources	86	41	120	67	143	96	128	95	28	22	505	321
Starting a slaughter goat enterprise	38	26	39	23	63	39	66	61	10	8	206	157
Total	124	67	159	90	206	135	194	156	38	30	711	478

Enro = enrollees; Grads- graduates

- **Control:** learners have control over their time, their pace, place and topics to learn. The courses according to learners are easy to navigate, as instructions are sufficient to guide them.
- **Utility:** the learners found the topics relevant because they answered the very problem they have in their farms. Hence it was easy to understand the topics. In fact, many of these graduates already promoted the e-learning to their friends and families, as they saw its usefulness.

## Conclusion

The purpose of offering the e-learning courses was to complement the other promotional modalities and help goat raisers improve their practices to address their current low productivity. Although no formal impact evaluation of the effect of the courses on the lives of these learners has been done to date, the emails and messages of the graduates to the development team can attest to the fit of the topics and

their satisfaction over the courses... enough reasons to push through with more e-courses for farmers.

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