Enhancing Learning/Continuing Education through Technology Mediated Open and Distance Learning: The case of Agricultural Facilitators and Rural Farmers in Ghana
Enhancing Learning/Continuing Education through Technology Mediated Open and Distance Learning: The Case of Agricultural Facilitators and Rural Farmers in Ghana

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Abstract
This paper shares the experiences and lessons learned in a pilot project to provide continuing agricultural education for Agricultural Extension Agents (AEAs) and farmers using open and distance learning methods and materials.

Limited continuing educational opportunities for the agricultural facilitator and the farmer have led to lack of motivation to engage in any planned learning activity. Also the over reliance on traditional extension methodologies which rely on face-to-face teaching and learning tend to have limited coverage.

In order to meet these challenges, a COL sponsored project exploited opportunities provided by Technology Mediated Open Distance (Tech-MODE) to continually update the knowledge and skills of facilitators and farmers groups. In this paper we present experiences and lessons learned in the use of multimedia such as print, radio and audio cassette to enhance the transfer of new technologies for improved livelihood of small farmers.

Introduction
Agriculture is the mainstay of the Ghanaian economy and provides for the livelihood of 70% of the population. However yields have remained low and thus adversely limiting their potential income and affecting the nutritional status of the poor. Agricultural extension programmes provide the much-needed help to farmers in the form of practical field advice and improved technologies from Research Institutions and the Universities. Yet the enormous demand for agricultural facilitator and small farmer-group training has never been met through conventional extension methods. As the gap between production deficit and the demand for food and export crops widens the need to enhance learning through a wider range of information and channels of communication represents a major challenge for the agricultural facilitator and small farmer-group in Ghana.

Open Distance Learning (ODL) activities have been part of the education scene for a long time and is currently receiving a boost by the Ghana Government in the effort to increase access to all forms of education and at all levels (Aggor et al 2002). However, its use for continuing agricultural education is a new phenomenal. Using ICT to support ODL (also known as Technology Mediated Open Distance Education - Tech - MODE) holds promise to provide new learning opportunities which will enlarge the information space and facilitate regular learning of improved agricultural
technologies. Opportunities provided by Tech – MODE was therefore exploited to continually update the knowledge and skills of facilitators and farmers groups.

This paper reports experiences and lessons learned in the use of multi media such as print, radio and audio cassette to enhance the transfer of new technologies on healthy vegetable production for improved livelihood of small farmers. The project started in 2005 to pilot relevant distance learning methods and materials to provide continuing agricultural education to AEAs and farmers as a mechanism to promote the production of healthy vegetables. The principal components of the strategy as presented elsewhere (PCF4 Abstracts, 2006) were:

- Participatory needs assessment survey to understand farmers information needs and their use of relevant media
- Capacity building for content developers, agricultural facilitators and farmer groups
- Selection of appropriate information media for programme delivery
- Facilitating the broadcast and access of agricultural information through radio and audio cassette by extension agents and farmers and
- Providing a support system to enhance learning

**Methodology / Approach**

*Participatory needs assessment survey to understand farmers information needs and their use of relevant media*

A participatory needs assessment survey was conducted to understand intermediary and end user information needs and use of relevant media among others. The survey was carried out in 3 communities (Asueyi, Tanoso and Tanobuasi) in the Techiman Metropolis. The communities were chosen because they represent typical vegetable growing areas in the metropolis and receive information support from Ministry of Food and Agriculture (MoFA) and Women in Agricultural Development (WIAD). They also receive radio signals from 3 FM stations in the Metropolis. In all a total of 16 extension facilitators popularly known in Ghana as agricultural extension agents (AEAs) and 58 farmers were involved in the survey (Osei et al, 2003).

*Capacity building for content developers, agricultural facilitators and farmer groups*

A training workshop was conducted for content developers to develop suitable materials for extension agents. The training was to enable them write courses that specified clear objectives, relate materials to experience of agricultural agents, and engage them in activities to reduce boredom while making them work through the material (Annual Report, CAEPG, 2005).

An orientation workshop on use of the ODL materials for self learning was conducted to discuss content and use for field activities. Emphasis was on field activities to be conducted under each unit of a module.

AEAs conducted face to face discussions and practical activities in farmers fields and provided feedback to colleagues during their monthly meetings.
Selection and use of appropriate information media for programme delivery

The project used print, radio, and audio cassettes as the media to deliver the programme.

The print medium was used to target extension agents. It was selected because it is; familiar to extension agents, relatively inexpensive and portable. Print can also be used without additional equipment anytime; anywhere when light is available (Verduin and Clark, 1991).

Radio was used to target the vegetable farmers. Radio was crucial in overcoming the literacy barrier that went with the print medium. This is important in a country where 50% of the adult population is illiterate (Ghana Statistical Service 2000).

Audiocassette was used to target farmers. Since farmers are not always able to listen to live radio broadcast of agricultural programs due to factors beyond their control, the use of audio cassettes which are familiar to farmers was considered appropriate to allow for delayed listening.

Facilitating the broadcast and access of agricultural information through radio and audio cassette and listening clubs by extension agents and farmers

Extension agents and selected farmers from the project area participated in radio discussions which were broadcast live. Live radio broadcast was recorded on audiocassettes for replay by farmer listening clubs during their meeting days. The formation of listening clubs to analyze agricultural information on radio was an important milestone of the project.

Providing a support system to enhance learning

The project provided monthly face-to-face support sessions over the six month delivery period for extension agents. In this regard the role of the Metropolitan Directorate of Agriculture and project staff of the Crops Research Institute was crucial in helping the agricultural agents learn effectively.

The agricultural information centre in the Metropolis was used as an important resource centre for communicating information via telephone, CD ROMs and cassette recordings. The staff of the centre played the important role of facilitating farmer-groups to access agriculture information through radio and audio cassette recordings and

Results and Discussions

Participatory needs assessment survey of Extension Agents and farmers

Survey results showed that:
- Farm information sources were limited to traditional channels such as farm field days and demonstrations, colleague farmers, and agricultural inputs sellers.
- Farmers had a good knowledge of some multi-media of which radio, cassette recorders, the agricultural information centre, telephone and video were listed in order of importance (Table 1).

Table 1: Farmers Knowledge on ICTs and Use in Food Production

<table>
<thead>
<tr>
<th>ICT tool</th>
<th>% know</th>
<th>% use</th>
<th>ICT perceived as useful tool for agricultural information</th>
<th>Mean score</th>
<th>Rank as most relevant ICT tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio</td>
<td>96</td>
<td>66</td>
<td>80</td>
<td>81</td>
<td>1</td>
</tr>
<tr>
<td>Audio cassette</td>
<td>90</td>
<td>60</td>
<td>70</td>
<td>73</td>
<td>2</td>
</tr>
<tr>
<td>Agricultural Information centre</td>
<td>60</td>
<td>17</td>
<td>95</td>
<td>57</td>
<td>3</td>
</tr>
<tr>
<td>Mobile telephone</td>
<td>98</td>
<td>10</td>
<td>60</td>
<td>56</td>
<td>4</td>
</tr>
<tr>
<td>Video</td>
<td>80</td>
<td>30</td>
<td>55</td>
<td>55</td>
<td>5</td>
</tr>
<tr>
<td>Computer</td>
<td>30</td>
<td>4</td>
<td>10</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Internet</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

Capacity building for content developers, agricultural facilitators and farmer groups

The training workshop for content developers resulted in the production of 5 modules of Distance Learning Materials (DLM) which were field tested with Extension. Fifty copies each of the modules were produced and distributed among extension agents in the project area (See fig 1). The modules are:

- Module 1. Integrated Pest Management for Agricultural Extension Agents
- Module 2. Use of Sub-Soil Nursery
- Module 3. Calibration, Uses and Maintenance of the Knapsack Sprayer
- Module 4. Preparation and Use of Name Extracts
- Module 5. Safe Use of Pesticides

These training materials produced formed the basis of the FM radio content delivery. According to Osei et al (2003), training topics resulting from identified training needs will have direct relevance to the needs of trainees and therefore enhance learning by adults such as farmers and extension agents.

Selection and use of appropriate information media for programme delivery

Print medium was found appropriate for learning by AEAs since they had a minimum of secondary school education. Based on the survey results, which indicated that radio was the most important mass media, radio was the obvious choice for extension training with farmers. For example

- Majority (98%) of the farmers either owned or had access to radio or radio cassette player.
- They indicated the presence of 3 FM radio stations in the Techiman Metropolis and listed their preferred radio stations in order of importance (Table 2).
• Extension agents corroborated that radio was the most important mass media for extension training with farmers
• Majority of farmers had access to radio cassette players and were familiar with audiocassette.

The use of the multimedia approach enabled facilitators and farmers to learn from more than one medium providing the learner with opportunities to enlarge their sources for agricultural information.

Table 2. Access and Use of Radio

<table>
<thead>
<tr>
<th>Community</th>
<th>Own/Access</th>
<th>Preferred FM radio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asuayi</td>
<td>Yes (99%)</td>
<td>BAR and CLASSIC</td>
</tr>
<tr>
<td>Tanaso</td>
<td>Yes (98%)</td>
<td>CLASSIC and ASTA</td>
</tr>
<tr>
<td>Tuobodom</td>
<td>Yes (98%)</td>
<td>CLASSIC and ASTA</td>
</tr>
</tbody>
</table>

Facilitating the broadcast and access of agricultural information through radio and audio cassette and listening clubs by extension agents and farmers

Collaboration between Extension and Radio FM stations in the pilot area resulted in targeting specific topic areas that met the learning needs of the farmers. The participation of extension agents and farmers in the agricultural radio programmes has brought them and the media closer thereby demystifying the media.

Recordings of radio broadcast were dubbed on audiocassettes for replay by farmer groups during their meeting days.

Providing a support system to enhance learning

The monthly face-to-face meetings minimised the dropout rate, increased interaction between project staff and learners and reduced isolation of learners from project staff.

Lessons Learned

Key lessons learned in the implementation of the project are listed as follows:
• Understanding user needs is the basis for providing complementary agricultural training with open distance learning and information and communication technologies Projects that take into account user needs often address needs that they regard as important
• Use of multi-media approach in distance learning provides learners with opportunities to enlarge their sources for agriculture information enabling facilitators and farmers to learn from more than one medium.
• Selection of information media for delivery of information in rural communities should be based on accessibility, suitability and sustainability
• Conventional media such as radio and print for generation, documentation and dissemination of technologies are still relevant for rural communities
• Development of relevant local content is important for the facilitation of facilitator and farmer programmes.
• Linkages among research, farmer-groups, extension and rural radio stations are crucial for any successful use of Tech-Mode in disseminating agricultural information in rural communities.
• Providing a support system in a continuing education programme based on Tech-MODE is crucial to the success of the programme.

Way Forward

The presentation has shown how Tech-MODE can be used as an appropriate intervention for fulfilling the physical and social distances between researchers, extension agents, radio stations and farming communities. The following are the way forward.

• While the use of Tech-MODE in formal education is not new in Ghana, its use in continuing agricultural education is a new phenomenon. Policies will have to be strengthened to promote the use of Tech-Mode in agricultural education for extension agents and the farming community.
• Open Distance Learning and Information and Communication Technologies based agricultural training programmes should not be used only as complementary to the conventional agricultural training programmes but also act as an alternative source for agricultural training. Tech-MODE should therefore be used to strengthen agricultural training programmes for extension and the farming community.
• The sustainability of Tech-MODE initiated on a project mode will depend on its adoption and use by public agricultural institutions and other Agricultural NGOs on a wider scale to meet the different learning needs of extension agents and farmers.
• Linkages among research, farmer-groups, extension and other NGOs using Tech-MODE should also be linked to credit and marketing sources as a business strategy to promote self-replicability and sustainability.
• The key to use of Tech-MODE in a wider scale for facilitators and farming communities will also depend on how we sensitise or create awareness among decision makers to the potential of learning opportunities for agricultural development through open distance learning modes.
References


Annual Report, CAEPG (2005)


MoFA (2001), Workshop report on Developing Medium Term District Agricultural Development Plan for DADU, Techiman, July 2001

