



Aquaculture Knowledge Dissemination through Information and Communication Technology Projects: e-Learning Module Approach

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Abstract

e-Learning techniques are useful for delivering agriculture and aquaculture related knowledge and information to farmers directly and indirectly through Information and Communication Technology (ICT) projects like e-Choupal, iKisan and Information Village Research Project of M. S. Swaminathan Research Foundation (MSSRF). Identifying information needs of users of ICT projects in coastal areas and aqua farmers at regular intervals followed by disseminating appropriate information in the required electronic format could be a viable strategy for the improvement of knowledge and skills. Information needs assessment of users of Village Resource Centre and Village Knowledge Centres of Pudhucherry and Ramanathapuram, which are the information centers in coastal areas of Tamilnadu, India, initiated by Information Village Research Project of MSSRF was conducted. Based on the overall assessment, the asynchronous e-Learning modules on 'Handbook of fisheries institutions' in English, 'Mud crab fattening (*Scylla tranquebarica*)' in Tamil and 'Soil and water management in brackishwater shrimp aquaculture' in English were developed.

Keywords: Information and communication technology, e-Learning, knowledge management, aquaculture

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Introduction

Communication is a social process, designed to seek a common understanding among all the people of a development initiative and if it is to be effective in developing countries, we need to put appropriate and relevant channels of communication at their disposal. Anandaraja et al. (2006; 2008) stated that Information and Communication Technology (ICT) tools are increasingly attracting the attention of farmers including women, extension functionaries and educationists as a way of much-needed speedy transfer of technology in agriculture and allied activities. India boasts a maximum number of ICT projects such as e-Choupal, iKisan, n-Logue and Information Village Research (IVR) Project of M. S. Swaminathan Research Foundation (MSSRF) and others to provide sustainable digital access to rural communities (Mahalakshmi et al., 2008; Vedavalli, 2005).

The e-Learning techniques provide a fast and low-cost method to increase and improve the outreach to the vast community of users. Electronic technology encompasses everything from computer-based training (CBT), to compact disks (CDs), to web-based applications (Watchorn & Connor, 2003). e-Learning can be done using an internet connection, a network, an intranet, or a storage disk (Mason, 1998).

Today, e-Learning techniques have drastically changed knowledge management and sharing especially in the field of agriculture and aquaculture through ICT projects. In e-Choupal and IVR Project of MSSRF, e-Learning is enabled via synchronous (online) and asynchronous (offline) delivery system in respect of information on coastal aquaculture. MSSRF Information Village Knowledge Centre (VKC) is in possession of asynchronous e-Learning modules in the form of CD-ROMs in agriculture,

horticulture, animal husbandry and value added products. But in the knowledge centres, there is no asynchronous mode of e-Learning modules for aquaculture.

The role and scope of aquaculture can be enhanced in coastal areas through ICT projects only after assessing the information needs and the level of skills and knowledge of potential users of ICT projects. The paper presents the framework for the development of e-Learning modules, assessment of needs of users of Village Resource Centres (VRC) and discusses the structure of asynchronous e-Learning modules.

Materials and Methods

Information need assessment of users of Village Resource Centres (VRC) in Pudhucherry and Thangachimadam in Tamil Nadu, India, was conducted after a brain storming session organised by the Central Institute of Brackishwater Aquaculture (CIBA) and MSSRF on 18th September, 2006. Based on the overall assessment, the asynchronous e-Learning modules on 'Handbook of fisheries institutions' in English, 'Mud crab fattening (*Scylla tranquebarica*)' in Tamil and 'Soil and water management in brackishwater shrimp aquaculture' in English were developed. The module has been developed using 'the framework of e-Learning modules in aquaculture and its allied activities' developed by Mahalakshmi et al. (2009).

Data were collected from 206 users from nine VKCs viz., Veerampattnam (31), Pannithitu (30), Periyakalpet (25) and Ganapathychettikulam (17) from Pudhucherry, and MGR Nagar (22), Pamban (20), Olaikuda (20), Thamaraiikulam (20) and Sundharamudaiyan (21) from Thangachimadam, using well-structured and pre-tested interview schedule.

After discussion with experts, knowledge centre workers and volunteers of VKCs in both VRCs, three categories of needs assessment in e-Learning modules such as shrimp culture practices, diversified species and base information were selected for the study (Table 1). Users taking part in the survey were asked to indicate their perceived extent of needs along a three point continuum namely mostly needed, somewhat needed and not at all needed, with weights assigned to these responses as 2, 1 and 0 respectively (Sailaja & Reddy, 1999; Mahalakshmi & Krishnan, 2009).

Prioritization of the needs was assessed for both the VRCs separately using their corresponding VKCs information. For each VRC, the needs assessment score of their corresponding VKCs for each item was obtained by multiplying the frequencies with the respective weights and summing them up (Mahalakshmi & Krishnan, 2009). The overall needs assessment score for each VRC for each item was determined by adding the needs assessment score for all their corresponding VKCs. Summary of the measuring system of all the three categories of information needs of both VRC is presented in Table 2. On the basis of overall needs assessment score for each VRC of each item, ranks were assigned to all the items to ascertain their importance.

Experts reviewed the materials prior to creation of an information base for the module. The information base was converted to an asynchronous e-Learning module via electronic format using variety of media like audio, text, images and animation. The module was designed to consider the limitations of the rural market, such as computer hardware and software. A simple module layout and limited animation and images allowed quicker access.

Results and Discussion

Overall needs assessment score and their corresponding ranks of information of users of both the VRCs are given in Table 1. It could be inferred that in both the VRCs, the e-Learning module on soil and water management was ranked first, followed by disease management and feed management. Overall needs assessment score of VRC in Thangachimadam was higher than the VRC in Pudhucherry. This is due to the lack of interest evinced among the users in shrimp culture in Pudhucherry because of limited potential area for aquaculture practices.

In both the VRCs, e-Learning module on mud crab fattening and ornamental fish culture had a high ranking. The respondents also mentioned that the presentation of marketing channels and its addresses are very important in the e-Learning module on ornamental fish culture. There is minimal interest in the information and assistance in seaweed culture in both the VRCs as this is a well known activity in these areas. It was observed that members of both the VRCs had already undergone training in seaweed culture with the help of state departments and Non Government Organizations (NGOs). There was negligible interest in seabass culture in both the

Table 1. Information needs of users of Village Resource Centres (VRC)

Categorization of aquaculture and its allied activities	Pudhucherry	VRC	Thangachimadam	VRC
	Overall score	Ranks	Overall score	Ranks
(1) Shrimp culture practices				
Soil and water management	115	1	173	1
Feed management	26	3	80	3
Disease management	34	2	115	2
(2) Diversified species				
Seabass	10	4	3	4
Mud crab fattening	138	1	145	1
Ornamental fish culture	107	2	85	2
Seaweed	67	3	55	3
(3) Base information				
Address – fisheries/aquaculture educational institutes	145	3	166	3
Address – fisheries / aquaculture offices	145	3	166	3
Subsidies information	166	2	200	1
Coastal zone laws, acts and rules	141	5	137	5
Educational and health oriented information	185	1	173	2

VRCs as the duration of culture, carnivorous nature of the species and marketing were deterrent to adopt this species for culture.

Stakeholders evinced keen interest in information on subsidies for fishermen communities, aqua farmers and SC/ST communities, and welfare schemes for women, widows and children. Though information on subsidies ranked high, both the VRC respondents also recognized the importance of addresses of state fisheries, aquaculture departments, agriculture and allied universities, co-operative societies and farmers associations for better communication and extension linkages. Though the educational and health oriented programmes are not related directly to aquacultural activities, in both the VRCs, women have given importance to obtain the educational and health orientated information in the CD-ROM format. After the 2004 tsunami, the stakeholders have shown interest on information about coastal zone laws, acts and rules.

Based on the overall needs assessment of both the VRCs, e-Learning modules on 'Handbook of fisheries institutions' (Mahalakshmi et al., 2006), 'Mud crab fattening (*Scylla tranquebarica*)' (Mahalakshmi et al., 2007; Mahalakshmi & Krishnan, 2012) and 'Soil

and water management in brackishwater shrimp aquaculture' (Mahalakshmi & Krishnan, 2008) were developed. The knowledge workers expressed that 'English' was the preferred language for the representation of addresses of fisheries/ aquaculture institutions and offices. At the same time, they suggested that vernacular language 'Tamil' was the preferred language for the e-Learning module on mud crab fattening which is suitable for users who are unable to read or write in 'English'. The aqua farmers expressed that 'English' or 'Tamil' was the preferred language for them for e-Learning module

Table 2. Dimensions of information needs and their measurement of each Village Resource Centres (VRC)

Information needs dimensions	Items used	Possible score range*
Shrimp culture practices	3	0-618
Diversified species	4	0-824
Base information	5	0-1030

* This is based on a scale of 0 to 2, with mostly needed=2, somewhat needed=1 and not at all needed=0; possible score of each item is 0 – 206

on soil and water management. The handbook of fisheries institutions module had been prepared with a view to serve as a reference volume for different categories of stakeholders. This module contains the information on addresses of fisheries / aquaculture institutions, state fisheries departments/ corporations, and fisheries associations, foundations and societies. It also contains the details of training courses offered by the Institutes of Indian Council of Agricultural Research. In addition, the regular academic courses offered by fisheries universities/ colleges/private sector provide the useful educational information such as name of the courses, minimal requirements for the admission, age limitation, duration of the courses, mode of selection and fees structure. This module also contains the list of addresses of fisheries related magazines/newsletters/journals, which are useful for the students, scientists and extension/knowledge workers.

Mud crab fattening module was named as '*Kali Nandu Kolukka Vaikkum Murai*' in Tamil. Users can look for information regarding three types of culture systems in brackishwater area such as fenced earthen ponds, fibreglass cages and pens in open backwaters. The page on contact addresses lists the addresses, like training centers, the location of availability of extension materials, hatcheries, list of exporters, and banks. This can be used as a ready reference for women self help groups.

The module named as 'Soil and water management in brackishwater shrimp aquaculture' is navigated in the menu format. Users can select their requirements on soil and water management using the structured menu. Topics such as site selection, pond preparation and culture period are covered on separate modules. In these modules, messages are simple, clear and free of non-essential details that may confuse target groups; they provide only the needed information to the users of the centre, knowledge workers and extension educators.

The e-Learning modules on 'Handbook of fisheries institutions', 'Mud crab fattening (*Scylla tranquebarica*)', and 'Soil and water management in brackishwater shrimp aquaculture' developed based on the overall needs assessment are presented in a simple form to the users of ICT projects, aqua farmers, and extension educators for knowledge sharing. Through e-Learning modules, ICT projects can provide a powerful thrust to improve the aquacultural activities among the users in the

coastal areas. Furthermore, ICT projects can use e-Learning modules not only to make significant improvements to the aquacultural operations of the stakeholders, but also enhance the impact of the institutions, organizations and other constituencies they represent. Although face-to-face meetings, workshops, group discussions and demonstrations remain the mainstay of extension, new technology and electronic media can provide opportunities to the extension educators for innovative and cost-effective ways of information and knowledge sharing to users of ICT projects and aqua farmers.

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