

STRATEGIES FOR THE USE OF INTERACTIVE MULTIMEDIA TO TRAIN EXTENSION WORKERS ON LOW COST AUDIO VISUAL AIDS IN DEVELOPING COUNTRIES

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ABSTRACT

A grassroots level extension worker as a trainer, instructor, facilitator and action researcher at the local village level, has a major role to play for the success of an extension system of a country. Therefore he/she must be blessed with vast amount of knowledge and skills. However, the knowledge and skills included in the training programmes for extension workers emphasize agricultural technology than extension methodology. In particular, without appropriate grounding in communication skills the technology transfer process can quickly become ineffective. Available literature, along with an inter-country survey undertaken by the researcher, suggests that there are no proper training systems or trained professionals, to conduct training on audio visual aids in most of the extension organizations of developing countries. Media centres focus largely on the production of mass media material rather than training extension workers in the production of their own low cost audio visual aids. Interactive multimedia (CDROM) assisted training was proposed and two CDROMs were produced on flip chart and overhead projector technologies. Various strategies were tested in Sri Lanka to incorporate CDROM technology to improve skills in these two low cost audio visual aids. The results indicate that distance education utilizing multimedia courseware alone is not feasible at present. However, a more integrative approach to the use of multimedia and conventional training methods is shown to produce substantive improvements in this context.

KEY WORDS: Audio visual aids, Extension training, Interactive multimedia

INTRODUCTION

The role of the extension worker in developing countries has broadened significantly, in-line with changes in approach to development support. From a traditional role as the specialist agricultural agent, providing direction and technical information input to the farmers, the extension worker has now moved to take on more of a facilitation role. Farmers are now intended to become more directly involved in decision making, deciding on strategies, and problem solving at the local level. Extension workers are increasingly called upon to advise and consult rather than simply to inform. In this grand vision for the role of an extension worker, the quality of the available personnel becomes critical. Studies however, suggest that as many as 40% of extension workers in developing countries have inadequate training (Park and Gamon, 1994). That figure is hardly surprising when the pace of technical innovation in the agricultural sector is so great. Indeed, given the lag before many such innovations are implemented in developing countries, the competitive gap between developing countries and elsewhere is growing (Alawy and Safrit, 1994). The various training programs for extension workers in developing countries have generally been based on traditional educational practices, with a focus on teaching specialist technical knowledge. A number of studies have now criticized extension programmes specifically because they place too much emphasis on technical agricultural training at the cost of improving communication skills (Boeren, 1994; Crowder, 1996). A survey done by White *et al.* (1994) suggests that, although training on communication and delivery skills was rated

as the most important training topic for extension personnel, 75% of the respondents indicate that these topics were not adequately covered in the in-service training for extension workers.

A questionnaire survey of some forty (40) representatives from the agricultural organisations of sixteen (16) developing countries in Asia, Africa and the Indian Sub-Continent, was recently (1997) undertaken by the author. The responses tend to confirm the available literature (Somasekharappa, 1983; Adhikarya, 1994), in showing that agricultural organisations in developing countries have no formal training programmes in the design and production of audio visual material. Survey also indicated that inadequate training received on audio visual aids, lack of qualified staff to conduct training on audio visual aids and non-inclusion of audio visual training in pre-service and in-service curriculum are the major constraints affecting the use of audio visual aids by extension personnel. The survey clearly indicated that flip-charts are the low-cost audio-visual technology most widely used by extension workers in the training of farmers. A similar finding applies to the extension officers who train the extension workers, where a growing use of overhead transparencies in addition to flip-charts, is reported.

The purpose of this paper is to detail design and development of two interactive multimedia CDROMs, specifically produced to support the audio visual training needs of extension workers and their trainers. A number of implementation strategies for the CDROMs have now been trialed and tested by the author in the context of Sri Lanka. This paper will discuss the results of these strategies and finally recommend some training strategies for differing training context of extension workers.

MATERIALS AND METHODS

Development of two interactive multimedia CDROMs

The two widely used low cost audio visual aids (flip chart and overhead projector) have many features which are relevant to the training of extension personnel, and these are,

- the flip chart can be produced locally, in the rural setting, using available material and simple techniques
- the flip chart can be produced for specific needs and at a level of visual literacy appropriate to the rural community
- the flip chart requires no electricity and is easy to use, even in the poorly resourced extension training setting of a typical developing country
- the flip chart materials can be designed and produced by potential users themselves, meaning that charts are easier to make sense and use for extension training programme
- the overhead projector (OHP) is widely available at in-service training facilities

- the OHP can be adapted to support a range of low cost presentation techniques, which make training more effective
- the OHP is relatively easy to use, requires minimal technical support, and is in various ways already familiar to potential users.

The two distinct groups (extension workers, who train farmers, and those who train the extension workers themselves), provide different design opportunities and raise different design problems. In order to address a broad range of design issues, two interactive multimedia CDROMs have been developed, one each for the two different groups:

- (i) 'Flip Chart' is an interactive CDROM produced for extension workers. It uses text, graphic, video, animation and audio resources. It covers the principles of flip chart design and layout (formal and informal balance, alignment, proximity, unity etc); production technology, including principles of lettering, free-hand lettering and drawing, and drawing technique; visualization, when to use visuals, drawing graphs and tables, and people-centred visuals; and presentation techniques, do's and don'ts in a presentation of transparencies, and special applications (on- the- fly, use of flip chart as a flannel board and slot board, use of flip chart to show animations etc).
- (ii) 'OHP' is an interactive CDROM produced for the trainers of extension workers and higher-grade officers. It uses text, graphics, video, animation and audio resources. It covers equipment, parts, principles, and characteristics; room setting, screen position and angle; design of transparencies, lettering, colouring, and presentation of scientific data; production technology, acetate roll, direct drawing, photocopying, overlay technique, masking, movement, lithography, thermal copy, and mounting; and presentation techniques.

Considerable research into these two subject areas was required, as the published information is either out-dated or of little relevance to the specific needs of extension trainers in Sri Lanka. In particular, information on the following was developed:

- free-hand lettering techniques for the production of Sinhala characters were established, based on simple combinations of straight lines and circles
- free-hand drawing of farm personnel, appropriate to the appearance, movement and facial expressions of Sri Lankan farmers
- existing graphic designs (posters, charts, etc.) produced for extension workers in Sri Lanka were analysed to provide a set of guidelines for new work, consistent with the established graphic style
- special techniques of overlay, masking and movement were developed to correspond with equivalent techniques employed with flannel boards and slot boards.

As a first step in the process of developing interactive multimedia for training, the specific training needs were identified and analysed. For the purposes of this project, the training needs for each CDROM were determined as a set of competencies. Those competencies emerged from existing face-to-face training programmes, currently

undertaken by the Audio Visual Centre of the Department of Agriculture. Following the need analysis methodology of Wentling (1993), the training needs were determined through a formal job analysis (what tasks does the job entail) and task analysis (what are the key components, or critical steps in each of the identified tasks). The task analysis then guided the formulation of training objectives and assisted in the identification of relevant training content. Essentially, each section of the developed CDROMs corresponds to one of the tasks identified during the need analysis.

The two CDROMs were developed using Macromedia Director V5, PhotoShop, Illustrator, Sound Edit 16 and Adobe Premiere, and have been compiled for cross-platform operation in Windows 95 or above and Mac OS.

Interface and navigation design of CDROMs

The two CDROMs were intended for use in Sri Lanka, to support the agricultural extension training programme there. Few, if any, of the potential users were expected to have had much previous exposure to such technologies, so a familiar concept for the interface was used. The general metaphor for each training CDROM was that of a book. See for example, Fig. 1. The contents were organized into chapters, topics and sub-topics. Information is displayed as pages from an electronic book. The current section is indicated as a title at the top left hand corner of each page. Each page has a common area where navigation buttons appear (down the left hand side), generally indicating the other chapters, topics and sub-topics, available at the current level. Each page also contains a multimedia presentation of the topic or sub-topic, including video, sound/voice-overs, animations, graphics and text. All media are interactive, and users may review and/or skip sections, as they desire.

A number of other sections were also added to the concept of an electronic book. The entire contents of each CDROM are presented in the form of an interactive map showing the structure of the CDROM. The user can proceed to any section by clicking the appropriate box on this map, or by moving through the material page by page. A more conventional index of subjects in alphabetical order is also provided as an interactive navigation device. A number of key words and phrases were identified, and hot-linked to a glossary of terms which appear as floating windows for easy reference and immediate return to the source page. Every page can be printed to provide a hard copy reference.

The flip chart CDROM was supplemented with approximately 1200 frequently used agricultural line drawings. These drawings are catalogued and stored in a separate section. They can be printed individually, for use in flip chart or other production tasks.

The Flip Chart CDROM was produced for extension workers who would generally have a poor command of English. The Flip Chart CDROM has therefore been developed with the option for an interface and content presented entirely in Sinhala (Fig.2).

→ Trials of the system

Several trials of the CDROMs were undertaken at Audio Visual Centre and Regional Training Centres in Sri Lanka during the period August 1997 to February 1998. The trials were intended to evaluate a range of training strategies using the two CDROMs. The different strategies utilised a different mix and combination of the following variables:

- (i) use of the CDROM as a teaching resource by the instructor (use entire CDROM, only key sections, no use of the CDROM)
- (ii) use of the CDROM by individual delegates (use CDROM before the teaching session, use CDROM for revision after the session, make no use as an individual)
- (iii) use of the CDROM in practical sessions (use with assistance of media designer, use with assistance of a training assistant, use with no assistance).

Twelve training programmes, involving 160 delegates, in several geographic locations, were included in the trials. The trials were each observed and video recorded for subsequent analysis. Informal interviews discussions and a structured questionnaire was also used to collect data.

A key indicator of the success or otherwise of each training programme involved a performance evaluation of each delegate at the end of the training session. Each delegate was required to produce relevant flip chart material and/or overhead transparencies to support a 15-minute training session. The presentations were then evaluated using key subject areas and competencies derived from the original task analysis.

RESULTS AND DISCUSSION

The potential to use media designers of Audio Visual Centre (as the survey suggested, media centres of most of the developing countries) directly in the training of extension workers is limited by the growing demands for their services as media producers. In conventional training programmes for flip chart and OHP subjects, a media designer was required for at least 30 hours per session. In addition, an assistant was required for at least 13 hours to support the practical sessions. In the trials, using the CDROMs in both contexts as support tools, it was possible to reduce the involvement of media designers to 9 hours, and the assistants to just 5 hours.

If a media designer uses the CDROMs to support the teaching process, there is no imperative for the designer to be involved in the practical sessions where a media

CDROMs, then the performance of the workshop delegates is reduced substantially. There is a need for some intervention by the media designer or assistant during the practical sessions.

Substantial improvements were achieved in the time required to teach, and in the performance of the delegates, where delegates were given time to self-study the CDROMs before teaching began. In this scenario, delegates come to class after having already explored the CDROMs, and are better able to have a meaningful discussion and interaction. The teacher also then has only to present the most important parts of the CDROM.

CDROMs used as a stand-alone, self-learning training tool gave poor results in terms of each delegate's performance. This training strategy can be improved substantially however, if assistance is provided during the practical sessions.

If only one computer is available a trainer can use the whole content of the CDROM as a teaching aid to support the teaching. It was observed that 6 hours teaching in flip chart technology and 3 1/2 hours teaching in OHP technology were sufficient in this scenario. If assistance during practical is provided a remarkable performance can be achieved even from this strategy. This strategy is appropriate for regional training centres/districts to improve audiovisual skills in their own locality with limited resources.

Agricultural trainers in regional training centres and some hand picked extension workers can be more effectively used as a part-time audio-visual trainer (referred to as a regional master trainer) after they have been provided with CDROM-assisted training at a media centre (AVC). They can use either the above strategy with one computer or if sufficient numbers of computers (three participants for a computer) are available, some teaching after participants explore the CDROM is the obvious choice. Some guidelines and a flow chart with important sections of the CDROMs, must be given to regional master trainers for easy navigation. Since every audio visual trainer uses standard subject matter and media elements in the CDROM, uniformity of the subject can be maintained in every audio visual training.

CONCLUSIONS

This paper describes the development and application of two interactive multimedia CDROMs for training extension workers in the production of two low cost audio visual material (flip chart and overhead transparencies). A series of recent case studies undertaken in Sri Lanka which trialed the CDROMs in various training scenarios has been presented. The results indicate that distance education utilising multimedia courseware alone is not feasible at present. However, a more integrative approach to the use of multimedia technology and conventional training methods is shown to produce a number of substantive improvements in this context. CDROMs can be

incorporated to existing audio visual training programmes at Audio Visual Centre (any media centre conducts training on audio visual aids) with minimal use of media designers for training. This arrangement allows media designers to engage in media production function (video for training and telecast, print media, exhibition etc) in an effective manner. CDROM technology can be incorporated to regional training centres/districts to strengthen the local audio visual production mechanism with minimum financial assistance (one computer for an institute).

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