

# CONDUCTING AN EFFECTIVE & SUCCESSFUL TRAINING PROGRAMME

**READERSHIP:** A book meant for everybody related to any field.

It has been widely reported that the gap between training results and organizational outcomes remains un-bridged. It implies that training and its impact is a complex process and achieving desired impact out of training efforts is a factor of multidimensional variables.

In order to achieve the intended training impact, there is a need for meticulous planning and implementation of training events at all stages such as assessing organizational goals, competency mapping of staff and their training needs assessment as per the organizational goals, pre-training preparation, training organization as per the design, assessing training effectiveness, training impact in terms of pre-determined outputs and outcomes etc.

Hence, it is indispensable to have effective and efficient training managers, so that the training investment may reap desired benefits. In that way, this book has a general intent to give tips about effective management practices for the training managers.

This book specifically explains about training needs assessment, training institutes around the world and their experiences as well as practices, developing effective learning modules, training evaluation, training impact assessment etc.

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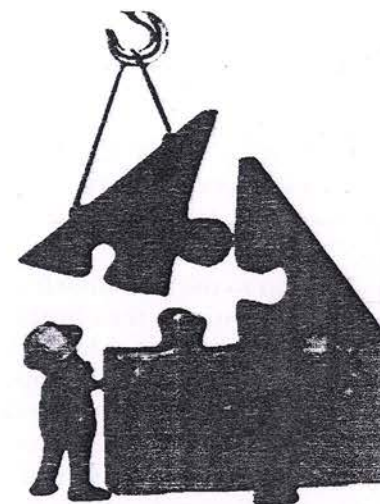
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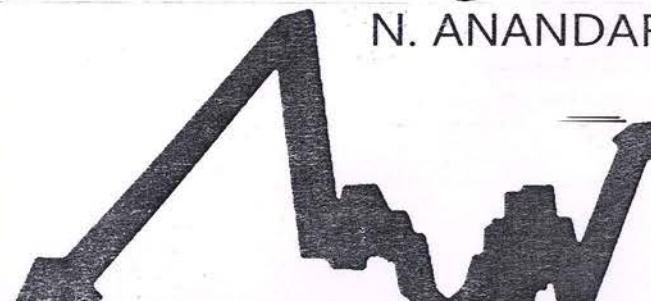
CONDUCTING AN EFFECTIVE & SUCCESSFUL TRAINING PROGRAMME  
BHARAT S. SONTAKKI R. VENKATTAKUMAR N. ANANDARAJA



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This book is a significant addition to the available literature in the domain of training management. I congratulate the efforts of Dr Bharat S Sontakki, Dr R Venkattakumar and Dr N Anandaraja in compiling and editing this book. I also appreciate the editorial support extended by Ms Aneeta. I believe 'Conducting an Effective and Successful Training Programme' will be a valuable reference resource for the training managers of ICAR institutes, State Agricultural Universities, Development Departments and Non-Governmental Organizations.

(D Rama Rao)  
Hyderabad

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## CHAPTER - 5

# Developing Effective E-learning Modules for Extension Training: Reflections from the Learning Theories

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### 1. Introduction

With the advent of globalization and subsequent economic liberalization, the focus of Indian agriculture is shifting from "subsistence" to "commercial" mode, where farming is viewed as a "business" rather than "life-support" system of poor farmers. Enabling farmers "decision-making" capacity is a primary driver of success in the market-oriented agriculture. This "commercial focus" has brought tremendous changes in the "nature" and "mode" of extension work. On the other hand, extension work organizations in developing countries like India, are being impacted by sharp decline in public sector funding, rapid technological innovations especially in the Information and Communication Technologies (ICTs), and the shift to a knowledge-based workforce. These developments created new opportunities for the extension workers to perform the information dissemination, capacity building and technology application more effectively.

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Developing capacities extension personnel to adapt to the changing work environment is an important task of the extension managers. Training is an important component of capacity building which equip the extension personnel with necessary knowledge and skills to tackle new challenges in this market-oriented agriculture. However, it is a daunting task for extension managers to train a large pool of extension workers numbering over 10000, who work in geographically and socio-culturally diverse environments. Several studies indicated several inadequacies in training the extending extension personnel both in terms of content and organisation (Vijayaraghavan *et al.*, 2005; Thanh and Singh, 2007).

## 2. E-LEARNING

E-learning is a novel approach to train a large number of extension personnel over distances in a short time. In general, electronic learning or e-learning refers to the learning that is delivered, enabled or mediated using electronic technology for the explicit purpose of training. E-learning includes both one-way and two-way exchanges as well as learner-to-learner interaction (Fee, 2009). The term e-learning is synonymous with multimedia learning, technology-enhanced learning (TEL), computer-based instruction (CBI), computer-based training (CBT), computer-assisted instruction or computer-aided instruction (CAI), internet-based training (IBT), web-based training (WBT), online education, virtual education, virtual learning environments (VLE) and digital educational collaboration. This approach transforms the learning process by integrating different media such as text, picture, audio, animation and video to create a multimedia instructional material in such a way that it promotes reading interests and willingness of the learner to learn. It also customizes the learning process to student's needs in terms of study style, time and space.

### 2.1. Modality of Learning in E-Learning

There are two modalities through which e-learning courses are delivered. They are self-paced or facilitated/instructor-led and synchronous or asynchronous. Often, e-learning courses combine both approaches.

#### *Self-paced Vs. Instructor-led*

Under self-paced learning, the learners are alone and completely independent. They are offered e-learning courseware such as Web-

based training (WBT)), that can be complemented by supplemental resources and assessments. Courseware is usually housed on a Web server, and learners can access it from an online learning platform or on CD-ROM. In this method, learners are free to learn at their own pace and to define personal learning paths based on their individual needs and interests.

In the Instructor-led facilitated learning, the learning is facilitated by and instructor. A linear curriculum is developed by integrating several content elements and activities into a chronological course or syllabus. The course is scheduled and led by an instructor and/or facilitator through an online learning platform. Learners, facilitators and instructors can use communication tools such as e-mails, discussion forums, chats, polls, whiteboards, application sharing and audio and video conferencing to communicate and work together. At the end, a final step typically includes an exercise or assessment to measure learning.

#### *Synchronous and asynchronous*

Synchronous events take place in real time that requires them the participants to be present at a given time. Examples of synchronous activities are chat conversations and audio/video conferencing. The asynchronous events are time-independent. A self-paced course is an example of asynchronous e-learning because online learning takes place at any time. E-mail or discussion forums are examples of asynchronous communication tools.

#### *Collaborative learning*

Collaborative learning is an educational approach that involves groups of learners working together to solve a problem, complete a task, or create a product. Learning occurs through active engagement among learners, either face-to-face or online. Collaborative activities range from discussions and knowledge-sharing to working together on a common project. Social software, such as chats, discussion forums and blogs, are used for online collaboration among learners.

### 2.2. Benefits of E-Learning

E-learning offer following benefits to the extension managers to provide effective training to extension personnel.



### **Customised learning**

The content and instructional methods can be tailored based on the work roles and learning needs of individuals (particularly their prior knowledge). In adaptive learning or personalized instruction, the computer program dynamically adjusts lesson difficulty and support based on learner responses. For example, if a learner completes six exercise questions and has them all correct, he/she is moved to a more difficult lesson topic. In contrast, if he/she has three of six correct, additional worked examples are provided followed by more practice exercises. With adaptive e-learning, the valuable staff time can be saved and the consistent learning is ensured by providing more practice and examples for those who need them and less for those who don't.

### **Timely and dependable content**

Since the e-learning is web-enabled, it can be updated instantaneously, making the information more accurate and useful for a longer period of time. The ability to upgrade e-learning content easily and quickly, and then immediately distribute the new information to users is extremely time efficient.

### **Learning at convenience**

E-learning breaks down traditional barriers to learning that helps users learn at their own pace, regardless of time and location. Learners can access e-learning anywhere and at any time of the day. They can effectively use their free time to learn without affecting office duties.

### **Universality**

E-learning is universal in nature since it uses universal Internet protocols and browsers to deliver training. All the learners on the Web can receive virtually the same material at same time.

### **Scalability**

E-learning solutions are highly scalable. The data size, speed, and (number of participants) of e-learning can be increased with little effort or incremental cost.

### **Builds communities**

The networking technologies enable trainees to build on-line communities where they can come together to share knowledge and

insight. There are two types of e-learning communities such as training and on-line conference communities. E-Training communities promote virtual collaboration that is focused on addressing a specific topic area, usually supported by online learning tools and media. Online conferences can be delivered through integrating live web conferencing, streaming video, narrated PowerPoint presentations, and facilitated discussions over several days or even a several week period.

### **Less cost**

Though the initial investment is high, the e-learning is the most cost effective way to deliver instruction or information in the long run. It cuts travel expenses; it can also reduce teaching time, and significantly reduces the need for a classroom/teacher infrastructure.

## **3. APPLICATION OF E-LEARNING IN EXTENSION TRAINING**

E-learning has wider applications in extension. It can be used effectively in distance education, self-learning and blended learning i.e combining face-to-face teaching with e-learning. Realising the power of e-learning, several countries have utilised the e-learning methods and tools to reach the "poorest of the poor" for equitable delivery of development benefits. The "e-Learning for Agriculture and Fisheries" programme of Philippine's Department of Agriculture (<http://e-extension.gov.ph/elearning/>), Computer-Based Agricultural Extension Program (CBAES) of Korea (Park *et al.*, 2007), self-paced e-learning course on food security of FAO (<http://www.foodsec.org>), e-learn agriculture (<http://elearnagri.iasri.res.in/>) and Learn Rice (<http://learnrice.in/>) of India are few successful e-learning initiatives targeted to agriculture students and extension clientele. Few studies conducted in developed countries like USA have demonstrated the effectiveness of e-learning in extension work. Lippert *et al.*, (1998) conducted a study on delivering training via internet among extension personnel from South Carolina, Georgia, and Alabama counties and found that the agents participated enthusiastically in the training and liked the novelty of the learning method. Another research work conducted by McCann (2007) with extension agents of Mississippi State University Extension Service, USA showed that the agents liked interactive online environment than face-to-face training.

Though e-learning is an effective method of delivering instruction over distances, developing the content and presentation are the critical



steps in ensuring effective learning. Development of content and design of e-learning materials are skilful processes that need expertise in instructional design and media skills. As the technology advances and pressure to develop e-learning materials in a short-time, the instruction design is often poorly treated resulting in poor learning materials (Moloney, 2010). Studies conducted among extension personnel in USA (Thomas *et al.*, 2008) and Iran (Ahmadpour and Mirdamadi, 2010) indicated that poor instructional or course design as important constraint that affect the success of e-learning in extension. So there is an essential need to understand the approaches and instructional or learning design theories to develop effective e-learning modules.

#### 4. LEARNING THEORIES AND E-LEARNING

Learning is a permanent change in behaviour including both observable activity and internal processes such as thinking, attitudes and emotions (Schunk, 2012). For designing effective e-learning modules, it is necessary to understand three basic principles learning.

- i. The learning modalities of adults are different from children. So it is necessary to develop a learner<sup>2</sup>-focused design, layering knowledge development, signposting of the content and incorporating emotional connections with learners to make the learning relevant and enjoyable.
- ii. Learning process of the individuals vary with situations. Even if the uniform content and presentation is provided, the people learn differently due to their inherent capacity to learn, motivations and needs.
- iii. Deliberate planning of the e-learning instruction using specific learning strategies targeted at the learners will enhance learning and improve retention. A combination of text, graphics, audio and video will improve the learning process.

Learning theories have significant bearing on the effectiveness of e-learning, as there is a logical development from learning to instruction. A learning theory is an attempt to describe how people and animals learn; thereby helping us understand the inherently complex process of learning. They provide empirically-based accounts of the variables which influence the learning process, and provide explanations of the ways in which that influence occurs. In this section, the three major models of learning: behaviourism, cognitivism and constructivism are described and their implications for e-learning are also elaborated.

#### Behaviourism

The behaviourist school sees the mind as a "black box," in the sense that a response to a stimulus can be observed quantitatively, totally ignoring the effect of thought processes occurring in the mind. They view that learning was best achieved through a large amount of repetition of desired actions, the reward of good habits and the discouragement of bad habits. In this school of thought, the "teacher" is the dominant person in the classroom and takes complete control, evaluation of learning comes from the teacher who decides what is right or wrong. The learner does not have any opportunity for evaluation or reflection within the learning process, they are simply told what is right or wrong. The learning outcome of this approach is "superficial" that focuses only on the external change while the internal processes of learning and emotions also play crucial roles for effecting behaviour change.

Few guidelines from behaviorist perspective that help in designing e-learning are

- Learners should be told the explicit outcomes of the learning at the beginning of the session, so that they can set expectations and can judge for themselves whether or not they have achieved the outcome of the online lesson.
- Link paired concepts. For example, rolling the mouse over India on a map can display "New Delhi", while rolling the mouse over USA can display "Washington". Besides, other important aspects such as currency, no. Of states/counties etc related to India and USA can also be incorporated so that the trainee can get a "glimpse" of a country without exploring much about it.
- Incorporate matching pairs into an interactive game that facilitates repetition.
- Use uniform design for background, navigation and contents.
- Provide plenty of questions for practice.
- Reward correct responses to questions with a visual/verbal reward (eg a big green "tick" and the message "Well done!") and a brief sound.
- Flag incorrect responses to questions with a visual/verbal message (e.g a small red x and the modest message "Oops, that's not right") and perhaps a brief sound (eg a buzz).



- Avoid exposing the correct answer upon an incorrect response. Instead, allow the learner to re-try. Learners are supposed to build proficiency from frequent review or revision with check tests at strategic points or repeat practice with feedback

### Cognitivism

The cognitivism paradigm essentially argues that the “black box” of the mind should be opened and understood. It views learner as an “information processor”, who can make logical decisions based on the choices available to them through thought processes. According to them, learning is the acquisition or reorganisation of the cognitive structures through which humans’ process and store information (Good and Brophy, 1990). In this process, the individuals create knowledge structures called schema. They process the information through three different models such as (i) the sensory register - where information is received by the senses (ii) Short term memory - where information is stored for brief periods and (iii) Long term memory - where information is stored for longer period.

The cognitive school recognizes the importance of individual differences, and of including a diversity of learning strategies in online instruction to accommodate those differences. Learning styles play a crucial role in cognitivist paradigm, which refers to how a learner perceives, interacts with, and responds to the learning environment and used as a measure of individual differences (Cassidy, 2004). This perspective demands a structured approach to instructional design and following guidelines may be followed while designing e-learning modules (Alzaghouli, 2012; Tracy, 2013).

- Structure the content of the e-learning course logically.
- The course materials should include activities for the different learning and cognitive styles.
- Start with the learning outcome and work backwards to connect it to prior knowledge. Fill in the gap. If the gap is extensive, consider multiple smaller courses rather than one big one.
- Use advance graphic organizers to put the upcoming content into context and to pre-organise it. In other words, assist the learner to link the new knowledge to the relevant point in their existing cognitive structure, and to construct high-level cognitive branches within which to fill the detail.

- Organize your content in increasing order of complexity. Provide an epitome of the domain initially, and then elaborate.
- Apply a minimalist design (uncluttered, readable and memorable) to reduce extraneous cognitive load.
- Use plenty of white space.
- Enhance the learning process by facilitating all sensors, focusing the learner’s attention by highlighting important and critical information, reasoning each instruction, and matching the cognitive level of the learner. This can be achieved by using bold font for key terms, modularize some of the text (enclose it in a box) to make it easier to digest, etc.
- Wrap multiple paragraphs into a single interactive show/hide object.
- Convert extensive text into a downloadable document or onto a wiki.
- Use an info-graphic to arrange key concepts in a framework.
- Place the text in the info-graphic as close as possible to the corresponding point in the picture. Consider an audio overlay.
- Avoid bright decorations and looped animations that compete with the substantive content for the learner’s attention.
- Allow the learner to control multimedia and to press “Play” when they’re good and ready, to avoid inducing mild panic.
- Use consistent navigation, symbols and visual design.
- Include activities that require sequencing and categorization.
- Employ real-world examples and scenarios.
- Summarize the key concepts.
- Include a formative assessment to enable the learner to test their knowledge, and to modify it or fill in gaps if necessary.
- Ask higher order questions to confirm deep understanding.
- Provide rich feedback.
- Allow time for reflection.



## Constructivism

Constructivism learning theory is defined as active construction of new knowledge based on a learner's prior experience. So an individual's knowledge is a function of one's prior experiences, mental structures, and beliefs that are used to interpret objects and events (Jonasson, 1991). In constructivism, the trainer's role is not only to observe and assess but to also engage with the trainee's while they are completing activities, and posing questions to the students for promotion of reasoning. Learning is a process of keeping trainees active by assigning high-level activities such as asking learners to apply information in practical situations, facilitating personal interpretation of learning content, discussing topics within a group, assessment etc. The constructivism learning theory, which focuses on knowledge construction based on learner's previous experience, is a good fit for e-learning because it ensures learning among learners (Modritscher, 2006). This perspective demands a learner-centred approach to instructional design and following guidelines can help to design an effective e-learning

- At the beginning, explain why the learner should learn. What specific problem will the training solve?
- Allow the learner to co-create the learning objectives.
- Content should be relevant, meaningful and practical. It should match learners needs and capacities.
- Avoid forced navigation: instead, allows the learner to explore the content at their discretion. A default linear navigation, however, will assist novices.
- Ensure the navigation menu is always accessible from anywhere in the course.
- Avoid using an end-point in the bulk of the course to mark completion: instead, use a summative assessment.
- Ensure the assessment is authentic.
- Where possible, enable the learner to undertake the learning at their place of practice.
- Use real photos rather than cartoons or illustrations.
- Encourage discovery learning.
- Provide your learners with a forum to ask questions and to learn from one another. The forum may be synchronous or asynchronous, or both.

- Encourage continual communication among the learners and their colleagues in the wider workplace. Consider a regular "community of practice" meeting if the conversation does not naturally emerge.

## 5. CONCLUSIONS

E-learning is an innovative method of imparting education and training through hybrid communication technologies in a short time over distances. Realising the potentials of e-learning, the Indian extension managers have created several innovative applications for delivering training. Though, these e-learning applications are able to solve the implementation problems, the "nature" of learning acquired through e-learning are still not assessed properly. Since the learning effectiveness is an important aspect of e-learning, there is a need to look into the process of effective learning by applying learning theories. Behaviourism, cognitivism and constructivism approaches provide valuable guidelines to improve the effectiveness of the learning. So, the extension managers should look beyond the "implementation success" of the e-learning and the focus on the "learning outcome" will improve the quality of learning which in turn transform the extension work at the field level.

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## CHAPTER - 6

# Ensuring Participation of Trainees in Training Need Analysis and Training Evaluation: Evidences of Successful Methodologies

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Improving the skill set of individuals is an important agenda of any development organization. The individuals may be anyone in the system who is directly or indirectly connected to the system. Agriculture System is a complex and multi-stakeholder system with farmers as the axis of the wheel with other stakeholders' forms part of spokes of the wheel. The scope for capacity building or training of every stakeholder has been peaking tremendously given the ever changing nature of the profession. The public and private training Institutions are vying with each other for conducting trainings in order to sustain the existence of the Institutions. Though a few institutions are really trying hard to take the technologies in real terms to the farming community, the following observations are very difficult to be masked.

The attempt to analyse the training needs beforehand with scientific rigour and objective evaluation of the impact of the training is lacking in many training institutions. The training institutions are hard pressed to complete the budget in very shorter period because of

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which they resort to conduct trainings, scarifying quality.

Hence, it is high time, that the training institutions have to reorient their strategies to keep in line with the rising demands. The training mythologies have changed drastically and now we moved from conventional training methods to participatory training methods to keep trainees engaged and to fulfill the objective of the training programme. (Ramasubramanian & Manoharan, 2002). The following table gives a vivid picture of changing paradigm of training

Traditional Training Methodology	Participatory Training Methodology
Teacher is more knowledgeable and experienced than students	Trainer's role is to ask questions and facilitate discussions
Teacher shares his/her knowledge with the students by lecturing	Everyone must reflect on his/her own, then share their ideas, experiences and expertise
Students are passive, just listening and taking notes	Trainees are active and analytical asking questing and exploring alternatives
Students learn right answer from their teachers	Trainees develop their own answers. Indeed, there may be many different answers

Training institutions are investing huge money, manpower, time and energy towards conducting trainings. The million dollar question is that whether these trainings produce intended results in terms of change in the knowledge, attitude of clientele which ultimately resulted in change in practice. The three training phases which has been quoted in text books for training namely training need analysis, training implementation and training evaluation are to be given focus individually and collectively.

Among these three phases, training need analysis and evaluation of training objectively assumes greater significance, since proper need analysis would result in avoidance of training areas which are not preferred by the trainees thereby saving all training related resources. Similarly objective training evaluation would facilitate mid-term corrections to be made in a series of similar trainings programmed.

As for as methodology for need analysis and evaluation is concerned, a voluminous literature is available. In this article, an effort is made to highlight successful methodologies for training need analysis and training evaluation which will be very helpful for training specialists for making use of such methodologies.

## PARTICIPATORY TRAINING NEED ANALYSIS

Analysing the training needs of farmers assumes greater significance since the prioritized training need by the farmers will make them attach to the training. Making the farmers accountable in training need analysis through participatory tools is an important strategy that many development organisations used to implement in recent days. While contemplating a versatile tool to analyse the training needs precisely, a tool namely Pair wise matrix ranking is found to possess many advantages. (Ramasubramanian & Manoharan, 2002; Ramasubramanian *et al.*, 2010). The utility of scoring and ranking methods has been well documented in the work of Mukherjee (1993) and Chambers (1992). The utility of Pairwise matrix ranking through a case study is given below.

In Pair wise Matrix Ranking, two items or attributes are given at a time for ranking to explore people's criteria for choosing one pair at a time and give reasons for the choice made. At the end, the most favoured choice is identified as the choice by cumulating the entries for different attributes.

### Procedure

The whole exercise of pairwise matrix ranking consisted of following steps

1. A matrix was pre-drawn with the all possible training needs enunciated by the respondents prior to starting the activity
2. The matrix should have equal number of rows and columns with the identified training needs occupying the cells. Each cell was named with a letter A, B, C....X upto the final training need for identity.
3. The method of ranking and the pairs were explained among the respondents for completing the matrix. It was stressed that the activity was purely for study purpose of researcher and the outcome of which would help the training system to give training based on the need.
4. At the beginning the administrator of the tool said the first pair of training need options A and B and requested the respondents to propose best one out of the pair based on