

Full Length Research Paper

Effectiveness of selected ‘advanced training programmes’ for agricultural faculty in India and implicative strategies

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The Centre for Advanced Faculty Training (CAFT) programmes aim at building the academic competency of faculty of State Agricultural Universities (SAUs) in India. There was a felt need to assess the effectiveness of these training programmes. Hence, a study was conducted during August 2012 to assess the effectiveness of selected training programmes and to draw implications for improving the programme mode in terms of pedagogy and training environment in order to enhance the academic competency of the agricultural faculty. The study was conducted with the participants (34) of two CAFT programmes through concurrent evaluation conducted at the end of the programmes. ‘Reaction’ and ‘learning’ measures of assessing training effectiveness were employed. The opinion of participants of two programmes in terms of pedagogy and training environment implied that the programmes were effective in building the academic competency of the participants. The paired-t test analysis conducted based on the results of case 1 indicated that the knowledge and skill gain of the participants were significant. The study, based on the focus-group discussion with the CAFT participants, CAFT Directors and the authority of two CAFT centres, recommends strategies for enhancing the effectiveness of CAFT programmes.

Key words: Effectiveness, advanced training programmes, agricultural faculty, implicative strategies.

INTRODUCTION

Training is one of the most widely used tools to improve the job performance of employees of organizations (Arthur et al., 2003). Considering the importance as well as the investment attributed to training of employees to achieve organizational goals, it is crucial to assess the effectiveness of such training programmes. As per the version of Kirkpatrick (1959), the objective of the training programme decides effectiveness measures to be applied, whether, reaction, learning, behavioral or results. The ‘reaction, measures are generally opinion of the trainees as response to the training module administered

by the training agency in terms of pedagogy and training environment. The ‘learning’ measures represent the learning outcomes as a result of the training interventions such as gain in knowledge, skill and change in attitude. Improvement in on-the-job performance of the employees after the training is the ‘behavioral’ measure, while the utility of training investment on employees for training them towards the organizational performance in terms of output and outcome is referred as the ‘result’ measure of training effectiveness (Arthur et al., 2003). According to Van Baren and Erskine (2002), 78% of the studies on

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Table 1. Profile of CAFT scheme in India.

Profile indicators	Particulars
Year of establishment as CAS	1971
Year of restructured as CAFT centres	2002
No. of CAFT centres	31
No. of programmes organized during XI plan period*	203
Average no. of programmes organized per centre during XI plan period	6
Average no. of programmes organized per year during XI plan period	40
No. of faculty trained during XI plan period	3402
Average no. of faculty trained per centre during XI plan period	110
Average no. of faculty trained per year during XI plan period	680
Total budget allocated in lakh rupees during XI plan period	1099.39
Budget allocated per centre in lakh rupees lakhs during XI plan period	35.46
Budget allocated per year in lakh rupees during XI plan period	219.88

*-2007-2008 to 2012-2013.

assessment of training effectiveness utilized reaction measures, while only 32, 9 and 7% of such studies adopted learning, behavioural and results measures.

Advanced training programmes for agricultural faculty

This includes Indian Council of Agricultural Research (ICAR), New Delhi set up Centres for Advanced Studies (CAS) with the support of United Nations Development Programme (UNDP) in 1971 in selected disciplines at various State Agricultural Universities (SAUs) and ICAR Institutes. The major objective was to enhance the competency level of agricultural faculty. These centres were established to encourage the pursuit of research excellence through collaboration between scientists of outstanding ability with their counterparts across agricultural institutions.

During the XI plan period (2007-2008 to 2012-2013) of the country, these CAS centres were restructured as Centres for Advanced Faculty Training (CAFT) (31) with adequate emphasis on academic competency building of faculty of Agricultural Universities in order to provide quality education to agricultural students. A total of 203 CAFT programmes (each of 21-day duration) were organized during XI plan period and more than 3400 scientists of NARS organizations were benefitted (Venkattakumar and Sontakki, 2012).

The information given in Table 1 capture the significance warranted to CAFT scheme by ICAR for building the capacity of faculty of agriculture with adequate investment of resources. Hence, it was imperative to justify the implementation of the scheme in terms of effectiveness of these programmes. It, therefore, necessitated to assess the effectiveness of CAFT programmes with a view to provide appropriate pointers for refinement of CAFT scheme, its operational

methodology etc. so that such programmes may be implemented with enhanced effectiveness during XII plan period (2012-2013 to 2017-2018). Such assessments must suggest strategies for improving the design of training programmes (Samanta et al., 2003). Keeping this in view, National Academy of Agricultural Research Management (NAARM), one of the constituent organizations of ICAR, conducted a study with the specific objective to assess the effectiveness of CAFT programmes. This study was the first of its kind to assess the effectiveness of CAFT programmes.

This paper discusses about the results of the effectiveness of two CAFT programmes and the resultant recommendations as two different cases. The results of this paper explain about the significance of enhancing the training effectiveness of CAFT programmes through appropriate pedagogy and adequate training environment.

MATERIALS AND METHODS

Setting

To assess the effectiveness of the CAFT programmes, concurrent evaluation of two selected CAFT programmes was done during August, 2012. One of the two programmes was organized by CAFT centre on "Veterinary Clinical Medicine, Ethics and Jurisprudence" at Madras Veterinary College (MVC), Tamil Nadu Veterinary and Animal Sciences University, Chennai, Tamil Nadu on "Current Clinical Techniques and Protocols in Farm and Pet Animals Practices" during 1-21, August, 2012. The other programme was organized by CAFT on "Horticulture (Fruits)" at Mahatma Phule Krishi Vidyapeeth (MPKV), Rahuri, Ahmednagar, Maharashtra, India on "Advances in Production Technology of Fruit Crops" during 8th to 28th, August, 2012.

Design of the study

The effectiveness of the faculty training programme was assessed

Table 2. Expectations of the CAFT participants of Case -1.

Expectations	RBQ	Rank
To improve academic competencies	56	1
To improve research competencies	49	2
To know current research trends	48	3
To establish and strengthen professional network	43	4
To create new research facilities	40	5
To fulfill career advancement demands	38	6
To improve extension competencies	28	7
To organize professional events	15	8
Mean RBQ	39.6	

through 'concurrent evaluation'. The concurrent evaluation had both the 'reaction' and 'learning' measures. The reaction measure was approached through formal focus-group discussions held with the participants, CAFT directors and authority of the host organizations of both the programmes and a questionnaire survey among the participants to capture the perceived effectiveness in terms of pedagogy and training environment.

In the programme organized by MVC, the effectiveness was also assessed by employing 'learning' measure, that is, arriving-at knowledge and skill gain of the participants administering a teacher-made test developed by the CAFT Director on the theme of the programme. The test was conducted twice at both pre-exposure (beginning of the programme) and post-exposure (end of the programme) stages.

Sampling and sample size

The sample of the study constituted the participants of the two faculty training programmes mentioned in the setting. The two programmes were selected purposively because these were the only two on-going programmes in August, 2012, the period suggested for the study team to carry-out concurrent evaluation by the sponsors. The programme organized by MVC had 20 participants, while that was organized by MPKV had 14 participants. Thus, overall 34 participants constituted the sample size of the study.

The instrument

For the questionnaire survey, a structured schedule was prepared that had components to capture the personal profile, expectations of the participants from the CAFT training, their opinion towards pedagogy and training environment and suggestions for refinement of the CAFT programmes. The expectations of the participants were obtained through ranking against pre-listed possible expectations. The opinion of participants towards pedagogy and training environment was obtained through rating against a five-point continuum (5-Excellent; 4-Very good; 3-Good; 2-Average; 1-Poor).

Statistical analyses

The ranking pertaining to expectations of the participants of MVC programme was analyzed through rank-based quotient analysis (RBQ) (Shenoy et al., 2006), while that of PDKV was done through percentage analysis. The rating of the participants pertaining to pedagogy and training environment of the CAFT programmes was analyzed through 'average'. The knowledge and skill gain of the

participants of MVC programme was done through average and percentage analysis. The significance of difference ($p < 0.01$) between pre and post-exposure scores of the participants of case-1 was tested through paired-*t* test.

RESULTS

Effectiveness of CAFT programmes-Case 1

The major expectations of the CAFT participants of "Current Clinical Techniques and Protocols in Farm and Pet Animals Practices" organized during 1st and 21st, August, 2012 organized by CAFT centre on "Veterinary Clinical Medicine, Ethics and Jurisprudence" at Madras Veterinary College (MVC), Tamil Nadu Veterinary and Animal Sciences University, Chennai were to improve academic competencies, research competencies, to know current research trends, to establish and strengthen professional network and to create new research facilities (Table 2). There was significant difference between pre and post training knowledge ($P < 0.001$) and skill ($P < 0.001$) scores of the participants (Table 3). The opinion of the participants towards pedagogy and training environment was ranging from 'very good to excellent' for all the aspects except for hands-on experience, boarding, lodging and transport facilities (Table 4). The opinion of participants towards hands on experience, boarding, lodging and transport facilities was ranging from 'average to good'.

Effectiveness of CAFT programmes-Case 2

The major expectations of the participants of CAFT programme on "Advances in Production Technology of Fruit Crops" organized during 8th to 28th, August, 2012 organized by CAFT on "Horticulture (Fruits)" at Mahatma Phule Krishi Vidyapeeth, Rahuri, Ahmednagar, Maharashtra were to know current research trends, improve research competencies, establish and strengthen professional network, create new research facilities, improve extension competencies, fulfill career advancement demands and to improve academic

Table 3. Knowledge and skill gain of the participants of Case 1.

Participant no.*	Pre-exposure knowledge scores	Post-exposure knowledge scores	Knowledge gain (%)	Pre-exposure skill scores	Post-exposure skill Scores	Skill gain (%)
1	27	42	36	64	88	27
2	49	78	37	66	105	37
3	45	77	42	89	102	13
4	42	46	9	110	105	-5
5	54	81	33	76	71	-7
6	37	55	33	51	98	48
7	37	66	44	62	111	44
8	46	58	21	92	101	9
9	29	51	43	62	113	45
10	35	49	29	55	64	14
11	26	60	57	78	91	14
12	40	56	29	60	82	27
13	43	63	33	78	105	26
14	37	57	35	49	81	40
15	47	57	18	110	111	1
16	57	73	22	104	110	5
17	24	48	50	110	123	11
18	32	80	60	116	123	6
Average	39	61	36	80	99	20
Paired-t value	8.58055E-08 (p<0.001) **			6.44145E-18 (p<0.001) **		

*-2 participants did not present during the post-exposure test and hence their values are not included in the analysis

Table 4. Evaluation of training effectiveness by participants of Case -1.

Evaluation criteria	Average score
Theoretical backup	4.2
Hands-on experience	3.9
Resource material	4.3
Extent of involvement of guest faculty	4.0
Level of training seriousness maintained	4.8
Boarding	3.1
Lodging	2.9
Transport	3.0
Learning environment	4.5
Faculty capacity	4.9

5, Excellent; 4, Very good; 3, Good; 2, Average; 1, Poor.

competencies (Table 5). The opinion of the participants towards pedagogy and training environment aspects was ranging from 'very good to excellent', except for hands-on experience and resource material (good to very good) (Table 6).

DISCUSSION

Case 1

The major purpose of establishment of CAFT centres

was to build and enhance the capacity of faculty of agricultural and allied sciences serving in State Agricultural Universities (SAUs), so that these faculty may educate the agricultural students in an effective manner. The expectations with which the participants of Case 1 programme as given in Table 2 inform that the first-ranked expectation is to improve their academic competency. Hence, it could be interpreted that the purpose of the CAFT as well as the participants matches well.

The participants also utilized these CAFT programmes

Table 5. Expectations of the CAFT participants of Case-2.

Expectations	Percent	Rank
To know current research trends	100	1
To improve research competencies	100	1
To establish and strengthen professional network	100	1
To create new research facilities	100	1
To improve extension competencies	92	2
To fulfill career advancement demands	92	2
To improve academic competencies	83	3
To organize professional events	67	4
Mean percentage		75

Table 6. Evaluation of training effectiveness by participants of case-2.

Evaluation criteria	Average score
Theoretical backup	4.1
Hands-on experience	3.8
Resource material	3.9
Extent of involvement of guest faculty	4.3
Level of training seriousness maintained	4.3
Boarding	4.3
Lodging	4.3
Transport	4.0
Learning environment	4.3
Faculty capacity	4.3

5, Excellent; 4, Very good; 3, Good; 2, Average; 1, Poor.

As an opportunity to improve their research competencies, to know the current research trends and thereby to create new research facilities at their respective organizations. Though, teaching has been the primary objective of the SAUs, the faculty are also interested in building and updating their research competencies, because their bio-data can be strengthened by publishing research and other publications based on the results of the research project. Such strengthening will help them in achieving success in career assessment as well as promotional opportunities.

ICAR insists participation of faculty of SAUs as well as scientists of its-own organizations in 21-day training programmes as one of the pre-requisite criteria for career advancement programmes. Hence, the participants utilized these CAFT programmes as one such opportunity to fulfill their career advancement needs, as all these programmes are organized for 21-day duration. Utilizing training as an opportunity to fulfill the career development needs by the participants of training programmes, has been reported and discussed by Renaud et al. (2004) and Gibbs and Coffey (2004). Some of the participants utilized the CAFT programme as an opportunity to establish and strengthen their professional network and thereby organizing professional events in their

disciplines. Some other wanted to acquire knowledge and skills pertaining to their extension-related activities to fulfill the mandate of their respective organizations.

The significant difference between the average pre and post-exposure knowledge and skill scores of the participants clearly indicates that the CAFT programmes was effective. The findings of knowledge gain are in line with that of Venkattakumar et al. (2009) about training programmes on Cashew Production Technology for the officials of development departments in India and Vijayalakshmi and Vasanthakumar (2011) pertaining to training-cum-demonstration for farmers. The average pre-exposure skill scores of the participants imply that they already had adequate exposure to skill practices imparted. Hence, CAFT centres need to be innovative and strive to introduce new skill training aspects which the participants may appreciate to acquire. The comparatively lesser favourable rating by the participants towards 'hands-on experience' (Table 4) also reiterates this point.

The opinion of participants about pedagogy and training environment was 'very good to excellent' except for boarding, lodging and transport facilities. Training logistics including comfortable accommodation, boarding, transport etc. also account for creating a conducive mind

set among the participants during training programme. The comparatively lesser rating of participants towards these aspects indicates the need for adequate attention and improvement in training environment. The significance of logistics in influencing training effectiveness was also reported by Lynton and Pareek (1990), Plesca and Smith (2007), Hamid (2011) and Adeyemo (2012).

Case 2

The expectations of the Case-2 participants were, interestingly, quite different from that of the Case-1. The participants were more interested towards building their research competencies such as knowing about current research trends, establishing and strengthening professional network and creating research facilities. This may be due to the reasons that they gave more weightage for their career assessment and strengthening their bio-data by taking up advanced research programmes and publishing the results in the form of research papers and other publications. This was an obvious behavior because the career assessment or promotion not only depends on the academic programs of the participants but also the number of research programmes handled by them and the number of resultant publications. Hence, to attract faculty with adequate expectations to build their academic competencies, it is imperative for ICAR to throw more weightage for the academic programmes organized by the faculty than research programmes handled by them and the resultant publications during career assessment and promotional opportunities.

The rating of participants towards hands-on experience and resource material was comparatively lesser than the other aspects. The hands-on experience enhances the skill competency of the faculty, while resource material might help the participants to transfer the knowledge, skills acquired during the programme back at their organizations by constantly referring to the resource material. Hence, these results imply the need for the CAFT centre to take initiatives in addressing these aspects. The importance of inclusion of adequate hands-on practical in the training schedule and distribution of quality resource material as a reference material for the participants as influencing factors of training effectiveness was adequately reported by Ansari and Chandragi (2000) and Kline (2009), respectively.

Recommendations for improvement of effectiveness of CAFT programmes

Based on the results of the questionnaire survey, focus-group discussions held with the two CAFT Directors, participants of the two programmes, authority of host

organizations and personal observations of the study team, the following recommendations are suggested for enhancing the effectiveness of CAFT programmes:

1. To attract faculty to CAFT programmes with adequate expectations to build their academic competencies, it is imperative for ICAR to throw adequate weightage in career assessment for the academic programmes organized by the faculty on par with research programmes and publications.
2. In order to attract wider participation of most eligible faculty for the CAFT programmes, the CAFT Directors should announce the programmes at least three months ahead. Multiple communication modes (mail, e-mail and uploading in website) may be employed to ensure that the training information reaches the intended participants in time.
3. CAFT centres must ensure that a bound volume of the resource material is distributed to the participants on the first day of the programme. This is intended to facilitate the application of enhanced self-efficacy and conscientiousness during the programme and intent and motivation to transfer the learning after the programme.
4. CAFT centres should organize appropriate fora for identifying and documenting training needs in their respective domain areas by involving a cross-section of the stakeholders. A structured training needs assessment should precede this event. A base paper prepared on the basis of such survey findings may be used for discussion during the event.
5. CAFT centres should make efforts to invite the best of guest resource persons. To enable this, the existing provisions for inviting guest faculty may be suitably enhanced in terms of number and amount of honorarium/remuneration.
6. The restriction in inviting the number of external experts for CAFT programmes may be lifted, so that experts from all over the country specialized in the disciplines related to the CAFT programmes may be involved in training the CAFT participants; the experts of CAFT programmes must give their best papers to the CFAT participants for further references.
7. Interactive lectures, method demonstrations and hands-on practical or experience are the most preferred training methodologies by the respondents. Hence, these methods must be utilized adequately by the CAFT directors while imparting training in addition to relevant field exposure visits.
8. More visits to the experimental and farmers' fields may be included; adequate provision for such visits may be included in the budget for CAFT programmes. Sessions for practical exposures and demonstrations must be adequately included; afternoon sessions may be planned with practical and hands-on experiences and demonstration sessions and theory-based interaction sessions may be scheduled during morning hours.
9. Training logistics including comfortable accommodation, boarding etc. also account for creating

a conducive mind set among the participants during training programme. In view of the increased cost on account of inflation, per day provisions for expenses towards boarding and lodge may be doubled from the existing provisions, so that CAFT centres may provide better boarding and lodge facilities.

10. Provision of contractual services comes very handy for managing the exigencies in CAFT centres. Hence, CAFT centres may build-in provisions for context-specific contractual services under contingencies head of the CAFT budget while sending the proposal for approval to ICAR.

11. There should be mandatory training evaluation. This can be done through appropriate pre and post-exposure knowledge or skill or both tests. This will give indication about the performance effectiveness of both participants and the CAFT training programme itself.

12. Performance assessment of CAFT centres may be done every year in terms of pedagogy, training environment, training effectiveness and impact. Based on such criteria best CAFT must be selected every year and awarded. This will motivate the CAFT centres to put-in best efforts to have enhanced training effectiveness and impact.

13. There is a need for regular updating of subject and training competency of CAFT faculty. Therefore, there should be adequate provisions for training of CAFT faculty at national as well as international platforms.

Conclusion

CAFT centres were established for competency building of faculty of SAUs in order to provide quality education to agricultural students. Based on the importance of such programmes in terms of investment of resources as well as the demand for quality faculty of agricultural universities, a study was undertaken to assess the effectiveness of CAFT programmes at reaction level in terms of pedagogy and training environment and at learning level in terms of knowledge and skill gains; and to suggest strategies to improve the effectiveness. It was found that the CAFT programmes were serving the purpose in building the academic competency of agricultural faculty and effective in imparting knowledge and skill. However, there is a need to improve certain aspects of pedagogy and training environment. Based on the focus-group discussion with stakeholders of the study, strategies were recommended to refine the CAFT programmes in enhancing training effectiveness. The initiatives taken by the faculty after the capacity building based on knowledge and skills acquired during CAFT programme in academic lines must be appreciated, valued and considered for the career assessment of the faculty. If not, the purpose of the capacity building programme and the participants may not match, thus, may defeat the very objective of the capacity building programme. Capacity building programmes targeting

faculty must be planned with innovative curriculum that may provide and impart new and skills to the faculty.

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ABBREVIATION

ICAR, Indian Council of Agricultural Research; **NAARM**, National Academy of Agricultural Research Management; **CAS**, Centre for Advance Studies; **CAFT**, Centre for Advanced Faculty Training; **SAUs**, State Agricultural Universities; **MVC**, Madras Veterinary College; **MPKV**, Mahatma Phule Krishi Viswavidhyala; **RBQ**, Rank-based Quotient.

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