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EVALUATION OF TRAINING EFFECTIVENESS BASED ON REACTION – A CASE STUDY

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ABSTRACT

Historically, since the middle of the previous century, Kirkpatrick's four level model consisting of reaction, learning, job behavior and the result has been the basis for evaluating the training effectiveness. The objective of the paper is to measure the effectiveness of the training programs at reaction level, and also to find out the difference of opinion and relationship among the variables of reaction (training management process, materials and course structure and satisfaction towards trainer) based on the demographic profile of the respondents. Data collected from 267 respondents from a population of 2645 participants attended training programs from six selected public sector undertakings. Descriptive statistics were applied by using SPSS statistics version 20 software for analysis. As a result of the analysis, it was found that the training institute needs to upgrade its machinery and equipment for imparting practical training, improve the quality of course materials and also to improve the competency of the faculty. Achieving training effectiveness is a combined responsibility of participants, the sponsoring organization and also the training institute. The sponsoring organization must ensure that suitable candidates are nominated for training programs.

KEYWORDS: Training, Reaction, Training Effectiveness, Training Management Process, Materials and Course Structure, Satisfaction towards Trainer

INTRODUCTION

Training

Training is a process of learning a sequence of a program's behavior. According to Flippo (1971) "training is an act of increasing the knowledge and skill of an employee for doing a particular job". Similarly, Beach (1980) viewed that "training is an organized procedure by which people learn knowledge and/or skills for a definite purpose". In fact, it is the training that bridges the gap between job requirement and employee present competence. A training program is not complete until you have evaluated the methods and results.

Evaluation of Training

Training evaluation is defined as the systematic collection, analysis, and synthesis of descriptive and judgmental information necessary to make effective training decisions related to the selection, adoption, value, and modification of various instructional activities (Warner and De Simone, 2009). This definition mentions both descriptive and judgmental information which provide a picture of what is happening or has happened, and show any opinion or belief about what has

happened in any given training intervention. Training evaluation includes the systematic collection, analysis, and synthesis of information according to a predetermined plan to ensure the information is appropriate and useful. Furthermore, an evaluation of training program can help managers, employees, and HRD professionals make informed decisions about particular programs and methods.

Training evaluation has provided several benefits which training practitioners and academics alike agree. Training evaluation can help to

- Determine whether a program is accomplishing its objectives;
- Identify the strengths and weaknesses of HRD programs, which can lead to changes as needed;
- Decide who should participate in future HRD programs;
- Identify which participants benefited the most or least from the program;
- Gather data to assist in marketing future programs; and
- Establish a database to assist management in making decisions (Phillips, 1983).

Effectiveness of Training

Training effectiveness is determined with respect to the achievement of training's goals or set of training's goals (Warner and DeSimone, 2009). In other words, training effectiveness must be determined in relation to the goals of the program or programs being examined.

In sum, training evaluation is a methodological approach for measuring learning outcomes. Training effectiveness is a theoretical approach to understanding those outcomes. Because training evaluation focuses solely on learning outcomes, it provides a micro view of training results. Conversely, training effectiveness focuses on the learning system as a whole, thus providing a macro view of training outcomes.

Evaluation seeks to find the benefits of training to individuals in the form of learning and enhanced on-the-job performance. Effectiveness seeks to benefit the organization by determining why individuals learned or did not learn. Finally, evaluation results describe what happened as a result of the training intervention. Effectiveness findings tell us, why those results happened and so assist experts with developing prescriptions for improving training (Alvarez, Salas, and Garofano, 2004).

Reaction - A Dimension of Training Effectiveness

The Kirkpatrick's four-level evaluation model was the main basis for measuring the effectiveness of the training programs. The four levels are reaction, learning, behavior and results. This study is limited to first level reaction.

Reaction evaluates personal reactions and participant's perception of aspects of the training management process, training materials, course structure and the instructor's effectiveness. Every training program should at least be evaluated at this level. Evaluation of reaction is inexpensive and relatively easy to administer.

The variables measuring the reaction are:

- Training management process,

- Materials and course structure,
- Satisfaction towards trainer.

REVIEW OF LITERATURE

Hitesh Chelawat (2015) has done their research in the topic "A comparative study of the effectiveness of training and development in service sector industries" revealed that employee training is becoming a necessity for every organization now-a-days. Employees are entrusted different roles and responsibilities in the organization. Training enables them to carry out these roles and responsibilities efficiently. The study concludes that there is a significant difference on the training aspects of need assessment, process, quality & effectiveness and scope for improvement in the different service sector industries.

Dr. Norsiah Binti Mat (2014) in the study entitled "Evaluation of Effectiveness of Training and Development: The Kirkpatrick Model", said that evaluation of training effectiveness is the measurement of improvement in the employee's knowledge, skill and behavioral pattern within the organization as a result of the training program. This measurement helps to match the cost incurred in the design and implementation of training with the associated benefits. Thus, it indicates whether the program has been able to deliver its intended goals and objectives. The purpose of this paper is to review the model of training effectiveness for the adoption by the human resources development executives in their planning, designing and implementing training programs.

Punia et al. (2013) in the study entitled "A Review of Factors Affecting Training Effectiveness Vis-À-Vis Managerial Implications and Future Research Directions", enlighten that the aim of this study is to examine the factors affecting training effectiveness and its implications. To examine the study a literature review has been done on different aspects of training. The findings of this study suggest many factors which affect training effectiveness like motivation, attitude, emotional intelligence, support from management and peers, training style and environment, open-mindedness of trainer, job related factors, self efficacy and basic ability etc. The paper also reveals models of training effectiveness measurement as well as the implication of a training program. The importance of training effectiveness is also discussed in the paper which is revealed through literature review.

Research gap

It is observed from the review of literature that there is no much research conducted on the evaluation of effectiveness of training programs in the areas of engineering conducted by government training institutes. Researcher got motivated to fill this gap. The researcher himself is a trainer directly involved in imparting training. This study not only brings out the drawbacks of the training programs, but also shows the ways to improve future training programs.

RESEARCH METHODOLOGY

Research Questions

The main research questions are

- What is the socioeconomic profile of the participants attended training programs?
- Whether the training programs at reaction level are effective or not?

- What is the difference of opinion of the participants on the variables of reaction based on their demographic profile?
- What is the relationship between the variables of the reaction level of training effectiveness?

Research Objectives

The main objective of the study is to evaluate the effectiveness of training programs among employees of the select public sector undertakings at reaction level. The specific objectives of this study are:

- To analyze the socioeconomic profile of the participants attended training programs from public sector industries.
- To measure the effectiveness of training at the reaction level as opined by the respondents of public sector industries.
- To evaluate the difference of opinion on the reaction based on the demographic profile of the respondents.
- To investigate the relationship between the variables of the reaction level of effectiveness of training.
- To provide the suitable suggestions if necessary.

Hypotheses

- **Hypothesis 1:** Training programs are effective at the reaction level as opined by the respondents.
- **Hypothesis 2:** There is no significant difference of opinion on the reaction based on the demographic variables (age, qualification, designation, experience) of the respondents.
- **Hypothesis 3:** There is no significant relationship between the variables of reaction level of training effectiveness.

Scope of the Study

This study focuses on the effectiveness of training programs conducted by Advanced Training Institute, Hyderabad for the employees of six selected public sector industries. The analysis is carried out by investigating variability of reaction, i.e., training management process, materials & course structure and satisfaction towards trainer. Questionnaires were distributed and data collected from the participants who attended the training programs.

Statistical Population

The researcher has identified the list of six public sector undertakings. The training programs are conducted by the Advanced Training Institute, Hyderabad for the participants sponsored by public sector undertakings. The total number of employees who have attended the training programs are 2645 from the public sector industries.

Sample of the Study and Sampling Method

The use of a sample about 10% size of parent population is recommended for any research. According to Roscoe (1975), it seems to use 10% as a "rule of thumb" acceptable level. Then, another author Alreck & Settle (1995) state that if the parent population is 1400 and then the sample size should be about 140. Hence, the researcher has identified 10% of the sample size is selected from each company from public sector undertaking. In this research, the researcher has adopted a simple random sampling method to collect the primary data.

Data Collection Method

Totally 300 questionnaires were distributed among the trainees from six public sector industries, the researcher found 267 filled questionnaires are in order and 23 questionnaires were found to be biased and incomplete. So 267 samples from public sector industries has been taken for the study.

Measurement Scale

The questionnaire consisted of a series of statements, where the trainees needed to provide answers in the form of agreement or disagreement. A Likert scale was used so that respondent could select a numerical score ranging from 1 to 4 to indicate their degree of agreement or otherwise. Numerical scores ranging from 1 to 4 indicate "strongly disagree", "disagree", "agree" and "strongly agree" respectively.

ANALYSIS AND DATA INTERPRETATION

Descriptive statistics were applied by using SPSS statistics version 20 software for analysis.

Demographic Profile

This part of analysis analyses the age, the educational qualification, designation and experience of the respondents from public sector undertakings.

Table 1: Age of the Respondents

Categories	Public Sector Undertaking	
	Frequency	Percent
30 Years – 40 Years	197	73.8
40 Years – 50 Years	70	26.2
Total	**267**	**100.0**

From the table 1, it's much clear that the majority of the respondents are between the age group of 30 years – 40 years with 73.8 percent, and then 26.2 percent of the respondents are between 40 years – 50 years of age group

Table 2: Educational Qualification of the Respondents

Categories	Public Sector Undertaking	
	Frequency	Percent
ITI	143	53.6
Diploma	124	46.4
Total	**267**	**100.0**

Table 2 clearly shows that the majority of the respondents have ITI as their educational qualification with 53.6 percent, and then 46.4 percent of the respondents have a diploma as their educational qualification

Table 3: Designation of the Respondents

Categories	Public Sector Undertaking	
	Frequency	Percent
Technician	143	53.6
Supervisor	124	46.4
Total	**267**	**100.0**

Table 3 clearly shows that the majority of the respondents are working as technician with 53.6 percent and 46.4 percent of the respondents are working as supervisors.

Table 4: Experience of the Respondents

Categories	Public Sector Undertaking	
	Frequency	Percent
5 Years – 10 Years	103	38.6
10 Years – 20 Years	72	27.0
20 Years – 30 Years	92	34.5
Total	**267**	**100.0**

Table 4 clearly shows that the majority of the respondents is having a work experience between 5 years – 10 years with 38.6 percent, then 34.5 percent of the respondents are having a work experience between 20 years – 30 years, then 27 percent of the respondents are having a work experience between 10 years – 20 years.

Testing of Hypotheses

Effectiveness of Training Programs at Reaction Level

The variables measuring the reaction are training management process, materials and course structure and satisfaction towards trainer.

H0: Training programs are effective at the reaction level as opined by the respondents

Table 5: Mean and Standard Deviation of Overall Reactions

Measuring Questions	Public Sector Undertaking	
	Mean	Sd
Training Management Process	3.07	0.264
Materials and Course Structure	1.15	0.361
Satisfaction towards Trainer	1.36	0.48
Mean Score	**1.85**	**0.358**

The respondents clearly state that they are highly satisfied with the training management process with a mean value of 3.07 and with a standard deviation of 0.264.

But to controversy the respondents clearly state that they are dissatisfied with the satisfaction towards trainer with a mean value of 1.36 and with a standard deviation of 0.48. Similarly the respondents clearly state that are dissatisfied with the materials and course structure with a mean value of 1.15 and with a standard deviation of 0.361.

As it can be seen in the table 5, this hypothesis have not been approved as the respondents clearly state that they are dissatisfied with the overall reaction with a mean value of 1.85 and with a standard deviation of 0.358.

Thus, the null hypothesis is rejected. Hence, training programs are not effective at the reaction level as opined by the respondents.

Testing of Hypothesis 2

Difference of Opinion on the Reaction Level Based on the Demographic Variables

$\mathbf{H_0}$: There is no significant difference between the variables measuring reactions based on the **age category** of the respondents

Table 6: Difference of Opinion between the Variables Measuring Reactions based on the Age Category of the respondents

Variables	Labels	N	Mean	Sd	F	Sig.
Training Management Process	30 Years – 40 Years	197	3.00	.000	78.210	**.000***
	40 Years – 50 Years	70	3.29	.455		
	Total	267	3.07	.264		
Materials and Course Structure	30 Years – 40 Years	197	1.16	.365	.083	.774
	40 Years – 50 Years	70	1.14	.352		
	Total	267	1.15	.361		
Satisfaction towards Trainer	30 Years – 40 Years	197	1.43	.497	20.038	**.000***
	40 Years – 50 Years	70	1.14	.352		
	Total	267	1.36	.480		
Reactions	30 Years – 40 Years	197	1.90	.303	14.396	**.000***
	40 Years – 50 Years	70	1.71	.455		
	Total	267	1.85	.358		
*** Significant at the 0.05 level (2-tailed).**						

The variables like training management process, satisfaction towards trainers and reactions shows that there is a significant difference between the opinion of the respondents based on the age category of the respondents, since its calculated significance is less than the assumed significance ($P < 0.05$). Hence the null hypothesis is rejected.

Whereas, the varied materials and course structure alone shows that there is no significant difference between the opinion of the respondents, since its calculated significance is greater than the assumed significance ($P > 0.05$). Hence the null hypothesis is accepted.

Thus, the null hypothesis HO in the case of materials and course structure alone is accepted. In all other cases HO is rejected.

H_0: There is no significant difference between the variables measuring reactions based on the **educational qualification category** of the respondents

Table 7: Difference of Opinion between the Variables Measuring Reactions Based on the Educational Qualification Category of the Respondents

Variables	Labels	N	Mean	Sd	F	Sig.
Training Management Process	ITI	143	3.14	.348	20.012	**.000***
	Diploma	124	3.00	0.000		
	Total	267	3.07	.264		
Materials and Course Structure	ITI	143	1.22	.414	9.744	**.002***
	Diploma	124	1.08	.273		
	Total	267	1.15	.361		
Satisfaction towards Trainer	ITI	143	1.37	.485	.293	.589
	Diploma	124	1.34	.475		
	Total	267	1.36	.480		
Reactions	ITI	143	1.79	.409	8.922	**.003***
	Diploma	124	1.92	.273		
	Total	267	1.85	.358		
*** Significant at the 0.05 level (2-tailed).**						

The variables training management process, materials and course structure and reactions show that there is a significant difference between the opinions of the respondents based on the educational qualification category of the respondents. The calculated significance is less than the assumed significance ($P < 0.05$). Hence the null hypothesis is rejected.

Whereas, the variable satisfaction towards trainer alone shows that there is no significant difference between the opinions of the respondents. The calculated significance is greater than the assumed significance (P > 0.05). Hence the null hypothesis is accepted.

Thus, the null hypothesis HO in case of satisfaction towards trainer alone is accepted. In all other cases HO is rejected.

H_0: There is no significant difference between the variables measuring reactions based on the **designation category** of the respondents

Table 8: Difference of Opinion between the Variables Measuring Reactions Based on the Designation Category of the Respondents

Variables	Labels	N	Mean	Sd	F	Sig.
Training Management Process	Technician	143	3.14	.348	20.012	**.000***
	Supervisor	124	3.00	0.000		
	Total	267	3.07	.264		
Materials and Course Structure	Technician	143	1.22	.414	9.744	**.002***
	Supervisor	124	1.08	.273		
	Total	267	1.15	.361		
Satisfaction towards Trainer	Technician	143	1.37	.485	.293	.589
	Supervisor	124	1.34	.475		
	Total	267	1.36	.480		
Reactions	Technician	143	1.79	.409	8.922	**.003***
	Supervisor	124	1.92	.273		
	Total	267	1.85	.358		
*** Significant at the 0.05 level (2-tailed).**						

The variables training management process, materials and course structure and reactions show that there is a significant difference between the opinion of the respondents based on the designation category of the respondents. The calculated significance is less than the assumed significance (P < 0.05). Hence, the null hypothesis is rejected.

Whereas, the variable satisfaction towards trainer alone shows that there is no significant difference between the opinion of the respondents. The calculated significance is greater than the assumed significance (P > 0.05). Hence, the null hypothesis is accepted.

Thus, the null hypothesis HO in case of satisfaction towards trainer alone is accepted. In all other cases, HO is rejected.

H_0: There is no significant difference between the variables measuring reactions based on the **experience category** of the respondents

Table 9: Difference of Opinion between the Variables Measuring Reactions Based on the Experience Category of the Respondents

Variables	Labels	N	Mean	Sd	F	Sig.
Training Management Process	5 Years – 10 Years	103	3.00	0.000	7.365	**.001***
	10 Years – 20 Years	72	3.14	.348		
	20 Years – 30 Years	92	3.11	.313		
	Total	267	3.07	.264		
Materials and Course Structure	5 Years – 10 Years	103	1.10	.298	7.590	**.001***
	10 Years – 20 Years	72	1.29	.458		
	20 Years – 30 Years	92	1.11	.313		
	Total	267	1.15	.361		
Satisfaction towards Trainer	5 Years – 10 Years	103	1.30	.461	1.929	.147
	10 Years – 20 Years	72	1.44	.500		
	20 Years – 30 Years	92	1.35	.479		
	Total	267	1.36	.480		
Reactions	5 Years – 10 Years	103	1.90	.298	2.835	.060
	10 Years – 20 Years	72	1.86	.348		
	20 Years – 30 Years	92	1.78	.415		
	Total	267	1.85	.358		
*** Significant at the 0.05 level (2-tailed).**						

The variables training management process and materials and course structure show that there is a significant difference between the opinion of the respondents based on the experience category of the respondents. The calculated significance is less than the assumed significance ($P < 0.05$). Hence, the null hypothesis is rejected.

Whereas, the variables satisfaction towards trainers and reactions shows that there is no significant difference between the opinion of the respondents. The calculated significance is greater than the assumed significance ($P > 0.05$). Hence the null hypothesis is accepted.

Thus, the null hypothesis HO in case of satisfaction towards trainers and reaction is accepted. In all other cases HO is rejected.

Pearson's Bivariate Correlation

This parts measure the relationship between the variables of measuring effectiveness of training **reactions** (training management process, materials and course structure and satisfaction towards trainer).

H_0: There is no significant correlation between the variables of reactions

Table 10 Correlation between the Variables of Reactions

Variables		TMP	MCS	STT	REA
TMP	PC	1			
	Sig.				
	N	267			
MCS	PC	-.121*	1		
	Sig.	.048			
	N	267	267		
STT	PC	-.211**	.139*	1	
	Sig.	.001	.023		
	N	267	267	267	
REA	PC	-.279**	-.112	.312**	1
	Sig.	.000	.067	.000	
	N	267	267	267	267

Table 10: Contd.,
**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
TMP- Training Management Process
MCS- Materials and course Structure
STT-Satisfaction Towards Trainer
REA-Reaction
PC – Pearson Correlation
N – Number of Respondents

Positive Correlation

The variable materials and course structure has positive correlation with the variable satisfaction towards trainer (0.139^{*}). Similarly, the variable satisfaction towards trainer has positive correlation with the varying reaction (0.312^{**}).

Negative Correlation

The variable training management process has negative correlation with the variables like materials and course structure (-0.121^{*}), satisfaction towards trainer (-0.211^{**}) and reaction (-0.279^{**}).

No Correlation

The variable materials and course structure has no correlation with the varied reaction.

Thus, the null hypothesis HO in case of correlation between materials and course structure with reaction is accepted. In all other cases, null hypothesis HO is rejected**.**

SUGGESTIONS

To improve the effectiveness of training programs the following suggestions are recommended.

- Machinery and Equipment in the training institute is to be upgraded.
- Practical training is to be imparted on the latest machinery and equipment.
- There is a need for a separate HR department at the institute mainly to take care of faculty development, faculty motivation, etc.
- The training institute should proactively ensure regular updating of faculty who are abreast with the latest developments and up to date content.
- Faculty competency is to be improved.
- Motivation mechanism should be in place like recognizing best faculty, etc.
- Quality, of course materials is to be improved.
- Training programs are to be designed by keeping in mind age, qualification, designation, length of service of the participants.
- Organizations should sponsor suitable employees for training programs.

CONCLUSIONS

Achieving training effectiveness is a combined responsibility of participants, sponsoring organizations and the training institute. The sponsoring organization must ensure that suitable candidates are nominated for training programs. While nominating candidates, the sponsoring organization may record major expectations from the participants after training. There should be mandatory training evaluation. This can be done through appropriate pre and post-training knowledge or skill or both tests. This will give an indication about the performance, effectiveness of both participants and the training program itself.

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