Evaluating the Effectiveness of Training Programs: A Case Study of Govah Company Employees in Iran

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Abstract: The purpose of this study was to measure the effectiveness of training program offered to 2 1 4 employees of the manufacturing department of G ova h Compa n y. Kirkpatrick's four levels of evaluation model were used as the measuring tool to evaluate the effectiveness of the training program in four levels (reaction, learning, behavior and results). This paper focuses on trainees' reactions to the training program (i.e., its materials and instructors) the level of skills and knowledge gained from the program (learning), impact of training program on behavior of employees (behavior) and impact of training program on business results (results) as the primary measures for effectiveness. Results of this analysis indicated that reactions to the training program were significantly positive & the skills and knowledge of the trainees increased as a result of the training. The findings also revealed that the perceived training usefulness and trainees' effort to gain skills and knowledge could serve as significant variable s in explaining training effectiveness.
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1. Introduction

Companies expend a large amount of money on imparting training practices. But prior to such a huge investment, they should analyze the need for conducting training to the workforce. There are chances in which firms can make mistakes if they are not assessing the training needs. An employee, for sure, requires training when he is found wanting in terms of the potentials that are essential to deliver the expected performance. The performance of an employee could fall short of the expectation due to the lack of sufficient knowledge and expertise, monotonous management or any other personal and official issues. All these problems spotted can be tackled by providing an effective training programme to the right employee and at the right point of time. (Smitha Das, 2010).

Prior studies (e.g., Kirkpatric 1994, Bramley and Kitson 1994, Clements and Josiam 1995, and Bedingham 1997) indicated that companies use different levels of analysis to evaluate training. Others extend the training evaluation in order to incorporate some measured outcomes of the training programs (e.g., skills learned or knowledge gained, measured changes in trainees' behavior on the job after the training, etc). Still other companies seek to measure the net financial effects of the training programs (or their returns) to the company, as a whole, or to its individual departments.

Bramley and Kitson (1994) indicated that measuring the effectiveness of a training program at the reaction level and (or) the levels of skills learned or knowledge gained are the most common approaches that companies use.However, Tan, Hall and Boyce (2003) indicated that trainee reactions to training programs tended to be poor predictors of training success. Many training programs fail to deliver the expected organizational benefits.

The most influential framework for the evaluation of training programmes has come from Kirkpatrick (Carnevale & Schulz, 1990; Dixon, 1996; Gordon, 1991; Phillips, 1991, 1997). The Kirkpatrick model (Kirkpatrick, 1959) follows a goal-based approach and is based on four simple questions that translate into four levels of evaluation.

Level 1 and Level 2 evaluations may be undertaken at the end of a training programme. To complete Level 3 and Level 4 evaluations a time lag is inevitable. As the level of evaluation goes up, the complexities involved increase. For this reason, and also because the cost can increase on a similar basis, many organizations do not use the entire model. As a consequence, training ends up being evaluated only at the reaction level, or at best, at the learning level. While these problems hold true for all training interventions additional problems arise in evaluating enterprise training and development programmes, particularly those targeted at adult groups.

Tyler (2005) further supported the above views by stating that globalization had helped to fuel the need for training and development around the world. This was affirmed by Stavrou-Costea (2005) that intense global competition coupled with extensive technological advancement had increased the recognition and awareness of organizations to invest in training and employee development for

competitive advantage. However, as training and development is viewed as an investment, it is thus important for organizations to ensure that such training efforts are not wasted.

Tennant, Boonkrong, and Roberts (2002) found that "wasted training"' is a common problem in organizations due to a lack of appropriate assessment of training effectiveness. Domenick and Gillis (2005) further reminded that training is a business initiative and the value of training cannot be known until it is measured. Therefore, to ensure that training and development efforts bear fruit, assessment of training effectiveness is required.

This paper attempts to measure the effectiveness of a Training Program offered to 74 Engineers and Assistant Engineers of the Manufacturing Department who attended the training program in Govah Company in Iran using the Donald Kirkpatrick's four levels of analysis.

2. Conceptual Background and Hypothesis

Evans (2005) concurred that training and development, specifically for managers is increasingly important as these managers need to be equipped with the relevant skills and knowledge to meet the impending challenges of today's dynamic and complex business environment. In a study on the Slovak Republic's healthcare leaders and managers, Rushnakova, Bacharova, Boulton, Hlavacka and West (2004) found that training for healthcare managers are essential as many of the managers in the healthcare industry do not have adequate knowledge and skills on management in general. Popp (2006) found too that food service operators in the United States is increasingly focusing training and development efforts on their management level employees in order to enhance their managerial skills and competences.

Empirical researches (Burke & Day, 1986; Carkhuff, 1983) have found that communication skill is the most costbeneficial training investment in the workplace. However, the findings of Burke and Day (1986) on the effectiveness of such managerial trainings via a meta-analysis have found mixed results. Furthermore, although it cannot be denied that interpersonal skills are of importance in building management competences and productivity (Carkhuff, 1983; Mole, 1996), there has been numerous researches in this area (Burke & Day, 1986; Carkhuff, 1983; Evans, 2005; Popp, 2006).

Training is also viewed as a powerful agent for facilitating an organization's expansion, development of capabilities and improvement of profitability (Cosh, Duncan, and Hughes, 1998). Huang (2001) agreed too that a well educated and well trained workforce is essential in maintaining an organization's competitive advantage. This was affirmed by Noe (2002) that training is increasingly being called upon to serve as the catalyst to drive change and to assists an organization achieve its stated strategic objectives. The above indicated that training is critical to organization's performance and success. Mulder (2001) however, found that training is an expensive intervention for organizations, but is required to ensure that human resources perform optimally, hence the need for assessing the effectiveness of training. Cheng and Ho (2001) agreed too that training is an expensive investment, thereby indicating that training is a luxury for organizations, yet, is of importance for effective human resource performance.

George M. Alliger (1959a, 1959b, 1960a, 1960b) has made an augmented framework for training criteria based on Kirkpatrick's model. Warr and Allen (1999) evaluated a two-day technical training course involving 123 motorvehicle technicians over a seven- month period in a longitudinal study using a variation of the Kirkpatrick.

Model and suggested that the levels in the Kirkpatrick Model may be interrelated. They investigated six trainee features and one organizational characteristic that might predict outcomes at each measurement level.

A review of all the studies mentioned and discussed above reveals that evaluation of training is very important for organizational effectiveness and the Kirkpatrick Model is the most widely accepted tool for evaluating training effectiveness.

It focuses on trainee's reactions to the training program (i.e., Reactions to the training material and the trainers) the level of skills and knowledge that trainees gained from the program, (Learning), impact of training program on behavior of employees (Behavior) and impact of training program on business results (Results).

The study is subjected to certain limitations. The size of the sample and its composition may affect our ability to generalize the results. The analyses were limited to only one program. It is possible that using other training programs or more than one training program may give different results.

This research has four hypotheses. The first one deals with trainees reactions to the training course. If the training course is perceived as ineffective, one would expect trainees to express unsatisfactory attitudes about the training program on the 12 statements of the feedback form (training material and effectiveness of the course trainer or instructor).

The first research hypothesis in the null form is expressed as follows. The null hypothesis assumes

that there is no significant association between the responses of employees and the training program while the alternate hypothesis assumes vice versa. The frequency distribution was also performed to analyze the reaction of the trainees towards the training program.

The second research hypothesis deals with the learning outcome of the training course. If the training course is ineffective, one would expect trainees not to gain any significant new skills or knowledge from the training course. If the training course is ineffective, one would expect trainees not to gain any significant new skills or knowledge from the training course. Accordingly, the following hypothesis was stated. This hypothesis verifies that there is no significant difference between the average trainees' score on the pre test before the training course and their average score on the post test at the end of the training course.

The third research hypothesis deals with trainees perceptions of the usefulness of the training course. If the training course is useful to the trainees in gaining skills and knowledge, one would expect their score on the perceived usefulness of training (that was recorded on the evaluation form) to be positively associated with their actual learning outcomes from the training course. This research hypothesis in the null form states that there is no significant relationship between trainees scores on the usefulness of the training course and their actual learning outcomes achieved from the training course.

The fourth research hypothesis deals with the effect of the trainee's personal effort to gain skills and knowledge from the training course. The literature on expectancy theory (e.g., Ibrahim 1989) establishes a relationship between effort and performance. One expects that high effort leads to improved performance. Based on this the null form of the fourth research hypothesis was formulated as, "there is no significant effect of the trainee's effort on their actual learning outcomes achieved from the training course".

3. Methodology

3.1. Sampling

With a view to evaluate the t r a i n i n g program, a survey was conducted among the employees by using well structured questionnaires and their immediate supervisors in the organization. The sample for the study comprised 214 respondents who attended the training programs. The mean age of the sample respondents was 25 years and the length of service ranged from 4 to 15 years. The present study is of a descriptive type. Therefore, data have been collected from both primary and secondar y sources. The primary data were retrieved through structured questionnaires.

The data was also obtained from secondary sources. The organization permitted the researcher to confidentially review the trainee's information sheets on site, training evaluation forms and training material. Training information sheets provided background information about each trainee (i.e., gender, age, and educational level).Training evaluation forms provided measures for trainee's reactions and attitudes toward the training and the level of effort each trainee exerted to gain skills and knowledge. The organization also provided information about the training costs, expected goals from the training courses, feedback from the field after the training regarding skills and knowledge gained, and possibilities for future add-on training courses.

3.2. Measures

This paper used, in addition to the demographics, four variables namely employees' feedback on the training program (reaction), skills and knowledge gained from the training program (learning), impact of training program on behavior of employees (behavior) and the impact of training program on business results (results).

4. Results

From the data presented in Table 1 it is evident that 47.1% of the employees have rated the training programme above average while 13.5% considered it good and 36.7% opined that it is of average quality. The frequencies of the chi-square test of these data are presented in Table 2 and the derived statistical parameters are presented in Table 3. These data bring forth that fact that the null hypothesis that there is a strong association between the opinions of the employees is rejected. Tables (1, 2 and 3).

The intercorrleation between the factors, i) subject and tools used, ii) clarity of the subject, iii) contents and aterials of the course and iv) the atmosphere with the other principal factors were analyzed by using rotated factor matrix the results of which are presented in Table 4. (Table 4)

Alpha analysis was applied to the research variable trainees' reactions to the training course to judge its reliability. The alpha coefficient obtained for the trainees overall reaction was 0.82. Alpha coefficients for training material and the course trainer were 0.86 and 0.88, respectively. These alpha coefficients indicate data reliability as they meet the minimum acceptable level of 0.70 as advocated by Price (1972).

The one-sample t-test was applied to trainees' reaction scores and paired sample t-test to the pre-test scores and the post-test scores to judge the training

effectiveness. These data presented in Table 5 show that there is a moderate correlation of 0.487 at 95% confidence level. The data presented in Table 6 shows that the mean test score has been increased from 21.27 to 31.65after the training. The paired sample test results presented in Table 7 reveal that the alternate hypothesis that there is significant difference between the means of the pre-test score and the post-test score is acceptable. These results indicate that the training course was effective Tables (5, 6, and 7). The data presented in Table 8 shows that the impact of the training could be rated good on49.7% of the employees while its impact on 43.2 % of the employees appears to be fair. Tables (8, 9)

A chi-square test was performed in order to assess the association between the training program and the behaviour of the trainess. The results confirmed the validity of the alternate hypothesis for the null hypothesis was rejected at 90 % confidence level. Thus the training program did significantly influence the behaviour of the employees. Certain measurable factors were assessed before and after the test in order to understand the effect of the training o the business in question. The results of this evaluation shown in Table 10 indicate that there has been a considerable improvement in business results. **(**Table 10)

5. Discussion and Conclusions

This paper examined empirically four levels of measuring training effectiveness by using a sample of Trainees who attended in a development program in 2012. The first level focused on trainees' reactions to the training material and the course instructor as documented in the trainees' evaluation forms. The second level focused on knowledge and skills gained from training as measured by scores on pre and post tests. The third level focused on the impact of training on employee's behavior and the fourth level concentrated on impact of the training on business results. The results indicate significant positive reactions to the training course.

They also indicate significant increase in trainees' knowledge and skills after undergoing the training as evidenced by the increase in the test scores. This increase is statistically significant. These results lead to the conclusion that the training program was effective. It has been identified through factor analysis that there are four major factor influencing the reaction of the employees on the training program. There has been an improvement in the business results when the pre-training and post-training measures are compared. Additional analyses also indicate that trainees' perceptions of the training usefulness and their efforts to gain knowledge and skills are significant variables in explaining training effectiveness. These results indicate the need to prepare the trainees mentally before holding training sessions. They need to be oriented about the importance of training and its usefulness & motivated to work hard to gain the desired skills and knowledge. In conclusion the researcher recommends some avenues for future research. Based on the feedback given by the employees the training program can be enhanced by improving the delivery of subject through expert's training practical exercises can be increased as it is expected as a better way of learning by most of the employees. Practical demonstration and constant practice during the training session makes the on job application easy for the employees. This study reveals that the training program can be further equipped with technology which is practiced during job functions. The interest among the employees can be sustained and increased by adopting new methods in teaching the course content .The positive attitude of the employees towards the training program could be increased by concentrating on the four major factors identified through factor analysis.

Table 1: Level 1 - Feedback of Employees towards Training Program

		Frequency	**%**	**Valid %**	**Cumulative %**
Valid	Good	60	13.5	13.5	13.5
	Above Average	209	47.1	47.1	60.6
	Average	163	36.7	36.7	97.3
	Below Average	12	2.7	2.7	100.0

Table 2: Chi-square Test – Frequencies

	Observed N	**Expected N**	**Residual**
Good	**60**	**111.0**	**-51.0**
Above Average	**209**	**111.0**	**98.0**
Average	**163**	**111.0**	**52.0**
Below Average	**12**	**111.0**	**-99.0**
Total	**444**		

Table 3: Chi-square – Test Statistics

	Rating
Chi-square	**222.613a**
Df	**3**
Asymp. Sig.	**0.002**

Table 4: Rotated factor matrixes – converged in 12 iterations

Meeting objective	**0.696**			**0.575**
Program pace Medium Aids Practical exercises Interest sustained	**0.684**			**0.457**
Knowledge	**0.674**			
Job Relevance	**0.622**			
Delivery subject Faculty	**0.610**		**-0.338**	
Clarity Subject Content modules	**0.580**			
Course materials	**0.480**			
Atmosphere		**0.379**		

1. Subject and tools used; 2. Clarity of the subject;
3. Content and materials of the course and 4. Atmosphere

Table 5: Paired Sample Correlations

		N	Correlation	Sig.
Pair 1	Pre-Test-Score & Post-Test- Score	37	0.487	0.002

Table 6: Paired Sample Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-Test-Score	21.27	37	1.995	0.328
	Post-Test-Score	31.65	37	5.648	0.929

Table 7: Paired Samples Test

		Paired Differences							
					95% confidence interval of the difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	T	df	Sig. (2-tailed)
Pair 1	Pre_Test_Score-Post_Test_Scor	-10.378	4.991	0.820	-12.042	-8.714	-12.649	36	0.000

Table 8: Impact of Training Program on Employees Behavior

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Good	92	49.7	49.7	49.7
	Fair Poor Total	80	43.2	43.2	93.0
		13	7.0	7.0	100.0

Table 9: Chi-square Test Statistics

	Rating
Chi-square	58.778a
Df	2
Asymp. Sig.	0.025

Table 10: Impact of Training Program on Business Results

Category	Pre-Training Measure	Post Training Target	Post Training Measure
Average No. Of defects in a Batch per week	9	0	4
Average Time taken to resolve the defects in the Batch per week	4	0	2
Average Cost incurred due to defects per week Average No. Of	1500	0	800
Machine breakdowns per week Average Time taken to repair the	4	2	1
machines per week	3	2	2
Average Cost incurred in repairing the machines per week	2500	1000	1065
Average No. Machines Replaced per month	1	0	0
Average No. Quality complaints due to operators fault per week	3	0	1
Average No. Safety complaints per week	2	0	1

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