

Investigation of the Effects of In-service Training Courses on Awareness Level of Personnel of Petrochemical company (Tondgooyagn) on the Base of Halton's model

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ABSTRACT

The aim of present study is to investigate the effects of in-service training courses on awareness level of personnel Tondgooyan petrochemical site based on Halton pattern. The present study is applied in its objective and semi-experimental in method of data collection. In the present study, the researcher's test is used in pre-test, post-test and questionnaire stages. Covariance analysis test was used to test the researcher's questions. Validity of questions was verified through Pierson Correlation and their reliability was analyzed through Cronbach's alpha. In present study, sampling method was used to collect the necessary data from employees and based on Morgan's table, among 240 employees participating in training courses, 201 individuals were chosen but in order to avoid unfavorable decline, 220 employees were randomly chosen which led to collection of 202 completed questionnaires. Findings of present study, as presented in statistical analyses, showed the effectiveness of in-service training courses for stuff working in Tondgooyan petrochemical site in enhancing their learning based on Halton pattern.

Keywords: Valuation; Effectiveness; In-service Training Courses for Stuff; Halton Evaluation Pattern

1. INTRODUCTION

In an era of information and knowledge explosion in which rate of development of technology and science is progressively increasing, the ignorance of human resources education towards such evolutions seems implausible. A deeper look into the objective of education shows that humankind is an entity of diverse and valuable dimensions and talents and his talents will be developed when all mental and bodily aspects are attended to. It is evident that education demands significant value embedded in it during human life. Beyond mere knowledge transfer, education aims to recreate the personality and capabilities of human resources so as to lead to human development. Some experts state that mankind knowledge is doubled each five years which generates evolution in everything.

So how can familiarize human resources of an organization with such changes and evolutions? Apparently, ignorance towards employees' teaching will endanger the survival and future of an organization. In this regard, human resources of contemporary developed countries have annual teaching courses. Survival of an organization is highly dependent on skills and information of employees. If such domains are satisfied on time, adaptability of the

organization with a volatile environment will be improved, too. That is why the efficiency of organizational human resources depends on the quality and qualifications of human resources. Some organizations believe that human resources are their primary asset and this fact is better realized in academic environments such as universities. So, in order to make sure that increase of knowledge, skills and qualification is continuous and applicable, employees should have sufficient training. After the end of teaching, it is natural to observe a condition in which organizations attempt to verify the effectiveness of attaining such educational objectives. Based on previous studies, in-service training courses are not effective in some cases. For example, Isfahani in a case study called "Investigation of In-service Training Courses for Managers of High Schools in Bushehr Province", found out that in-service training courses weren't effective.

Farahmand (2004), did a study called "Effectiveness of In-service Training Courses for Personnel of Sapgo Company". The results showed that special training courses have favorable output in regard to improvement of technical and expert knowledge of vital employees but a moderate effect was shown in regard to development of skills, readiness for fulfillment of duties and improvement of occupational performance of experts. Job satisfaction of experts had a less-than-average level and low effectiveness. In-service training courses are among the best available managerial options for adaptation with environmental changes and a guarantee of proper services provision, especially in public and service organizations. If such trainings are designed in an orderly and targeted manner and for satisfaction of real demands of employees, they will improve the performance of employees and organizations, develop managerial skills and enhance the satisfaction of employees and clients. Due to the fact that evaluation of effectiveness of training courses reflect a vantage point of quality of training activities for educational managers and planners of an organization, it enables educational managers and programmers to be better informed of positive and negative aspects of a program so as to generate a higher level of effectiveness of organizational in-service training programs. In this regard, different patterns were provided to evaluate the effectiveness of in-service trainings of which one can mention "Halton's Pattern".

In Halton's pattern, other associated patterns are utilized to provide a conceptual framework consisting of three results for preliminary training: Learning, Individual Performance and Organizational achievements. These results were regarded as acceptable indicators of development of human resources in a training process (Holton et al, 1997). Due to significance of development of organizational human resources and improving knowledge and skills of employees working in educational department of Tondgooyan petrochemistry company, this department is legally responsible to provide in-service training courses for employees so as to execute educational policies and update the skills and knowledge of employees and managers. In previous years, this organization had continuously provided in-service training courses.

Because of huge costs of holding comprehensive in-service programs by Tondgooyan Petrochemistry Company, the authors attempt to use Halton's pattern to evaluate effectiveness of in-service training courses. So the following question:

Main Question: Does in-service training courses have necessary effectiveness in enhancing the learning and awareness of employees of Tondgooyan Petrochemistry Company?

Staff training has broad meanings. It is not limited to concepts of internship or practical experience in a distinctive field and its dimensions has developed from learning a simple technique to comprehensive awareness of complicated techniques and sciences, skill in executing authority over and management of organizational, industrial and business

entities as well as proper behaviors and reactions towards human, economic, social and cultural issues. As human civilizations evolve from traditionalism to industrialization and from industrialization to post-industrial period, technologies are progressing, too. These changes are accompanied with necessity of paying attention to training characteristics so that without personnel training, management will lose its effectiveness. In regard to the significance of personnel training, the experts of this domain have provided many ideas such as Glenn Stulen, one of the most famous scholars of administrative science, who believes that training is a managerial tool and teaching and management are inseparable. Management is responsible for education to a degree to which it can emphasize training and cooperation in educational domains through organizational budgeting (Dessler, 2000).

Frederick Taylor, founder of scientific management, says so on the principles of management: "...employees should be chosen by scientific methods and trained in that way so as to make them prepared for fulfillment of appointed duties without taking the responsibility for choosing a job and developing talents" (Saadat, 2001). Schuler believed that staff training is any attempt which improves the current or future trend of staff performance through developing their ability of doing a job. Training consists of a series of activities which provides learning opportunities for different individuals so that they can obtain occupational skills and improve them. Proper policy making, realistic planning, smart implementation and flexibility demands a dynamic and efficient process the execution of which, in any system, necessitates consistent interaction with internal and external environment by which consistent modification is plausible. Otherwise, the system will have downward and disruptive trend. Teaching experts face challenges such as financial resources limitations, increase of social demands for using existing teaching opportunities and international evolutions and consequences such as reduction of efficiency, rise of unemployment rate, economic inflation and content-teaching skills inconsistencies. Other general systems of social order should be interacted and utilized. The above items add to the necessity of using proper mechanisms for policy making, design and implementation of educational procedures. Evaluation, as a significant and influential sub-system in all educational systems, can collect correct information and make proper decisions for each system component to help activists, benefactors and contributors. Evaluation, as the fourth stage of educational process, has a significant role for clarifying the achievement to objectives, effectiveness of educational courses and defining suitable reaction for optimizing educational program. Understanding the principles of learning, designing programs and management of educational meetings is only possible when learners can transfer their learnings into practical occupational output. In fact, it is essential that finishing training to be accompanied with clarification of effectiveness and realization of educational objectives (Singer, 2000; translated by Al aqha, 2000).

Nowadays, the issues of effectiveness and affecting are highly significant in organizational and educational entities because in the present evolving environment, those organizations can survive which have sufficient effectiveness and capability in attaining their pre-defined objectives. Most of scholars define "effectiveness" as the level of attaining an objective which implies that an action has more effectiveness in attaining presumed objectives when it is targets and done for better attainment of codified objectives (Farahmand, 2001). UNESCO (1986) defined "Effectiveness" in the following manner: "Effectiveness is the level or the rate to which activities obtain their results. Teachings are amply effective when educational products and results of teaching courses, satisfy learning objectives.

So, managers and implementers of teaching programs are not only responsible for codification and allocation of necessary learning facilities and resources but also accountable for communicating the efficiency and effectiveness of training programs. In the past, there

was more emphasis on the efficiency of teaching programs rather than their effectiveness. But previous studies and experiences clearly showed that mere attention to efficiency is not sufficient and lack of necessary evidence favoring the effectiveness of educational programs would lead to misinterpretation of their usefulness (Ghahramani, 2002).

Assessment patterns are formulated based on distinctive approaches of assessment definition. In other words, different definitions lead to different patterns. In addition to diversity of concepts and definitions, multiplicity of methodologies, different assessment applications, experience of assessment experts and assessment in different levels and conditions generate distinctive patterns (Bazargani, 2005).

In 1966, Halton in a paper called "The Flawed Four-level Evaluation Model" criticized the four-level pattern of Kirkpatrick and introduced an alternative model. This model was introduced as a result of developments in the domain of learning communication. Halton et.al, developed their activity through transmission system which was defined as all individual, educational and organizational elements which are influential in transmitting learning into individual performance. In the next stage, Halton provided a synthetic framework based on associated models which consisted of three primary educational outputs. These outputs consisted of: Learning, Individual Performance and organizational output. These results are introduced as acceptable ones in an educational process for developing human resources. So, modification of individual performance was regarded as an output of learning while organizational results are the effects of change in personal performance. Halton's transmission model was a theoretical basis for diagnosing strengths and weaknesses of learning transmission in organizations.

This pattern describes variables affecting evaluation process and their associations. In this pattern, reaction, as a component of Kirkpatrick model, was ignored because reactions are not considered as primary result of teaching but as intermediate variable between learning motivation of interns and their performance. In this pattern, individual performance was substituted for behavior in Kirkpatrick four-level model. Improving the quality of each service or activity is limited by awareness of current status based on which planning for a better situation is plausible. In order to be aware of current status, it should be initially evaluated. Due to the main objective of present study, the main (dependent) variable of present study is improvement of effectiveness of in-service training courses of personnel of Tondgooyan Petrochemistry Company the variation of which should be explained by independent variables. These variables are: Effectiveness of Management of Educational Programs, Occupational Knowledge.

Better association between in-service educational programs and personal-occupational demands of staff is accompanied with more effective management of educational programs and provided teachings lead to improvement of personal conception, improvement of learning and fortification of organizational culture and human communications in an organization as well as effectiveness of provided teachings.

2. LITERATURE REVIEW

In regard to evaluation of effectiveness of in-service teaching courses of employees in organizations within the country or in international scale, lots of studies have been done. Shahrani in a study called "Attitudes of Employees of Red Crescent Organization of Chahar-Mahal-va-Bakhtiari Province Regarding In-service Training Courses" found out that in such in-service courses, employees' expectations are relatively satisfied but due to the fact that half of the employees assess these courses as "moderate" and "weak", better and more favorable techniques are needed for better holding of such courses. Hosseinian and Tabatabai in a study on effects of in-service training courses for lecturer and trainers of technical schools for disabled students of Tehran on job satisfaction and capability found out that such in-service trainings are effective in improving the information of such employees. Hatami (2010) evaluated the effectiveness of in-service training courses of Human Resources Office in improving the performance of board of managers and employees of Islamic Azad University (branch of region. 1) to find out the level of improvement in knowledge, skills and attitude of such individuals.

The findings of his analyses showed that in-service teachings has positive and improving effect on the knowledge, skills, attitude and occupational behavior. In another study by Rajaii pur and Akbari (2011), the effect of different methods of teaching on improving the quality of in-service teaching courses of high school lecturers was investigated and it was found out that problem solution and appointing projects positively affect the quality of such courses in a manner which is higher than medium. In a study by Hendavi and Hendavi (2011) on analysis of the effect of in-service training courses of crisis management on the efficiency of managers working in Damavand town of Tehran province during incidents and the results showed that educational content of such courses march the demands of crisis occupational demands so that finishing a course of crisis management will improve the efficiency of managers. Orangi and Shahamat (2012) examined the effect of in-service training courses on professional performance of teachers living in Shiraz and the findings of their study showed that such courses have no significant effect on the performance of teachers in classroom management and evaluation.

The same case applies for educational status of student. In another study by Khanifar and Amiri (2012) in Ahvaz Oil Company called "The Association between In-service Training Courses and Effectiveness of Employees" found out that from the viewpoint of employees, the status of all tested factors was favorable and there was a significant association between in-service educational hours and effectiveness of employees. Khadadi (2014) in a study called "Evaluation of Effectiveness of Short-term Training Courses of Livestock Workers" concluded that level of learning among participants of such courses was in a favorable level. Studies in US airline agencies (United Airline, Transworld Airline, North-West Airline, Euhas, and A. Airline) showed that if in-service training courses don't satisfy working demands of airline employees, consequences such as increase of working errors and decline of efficiency and effectiveness (Quoted by Walter, 2000).

Davis (2006) showed that in-service training courses for teachers lead to higher commitment to organizational rules and better cooperation for enhancing the training capability of teachers and improvement of training performance of students. Hashimoto (2008), in another study done with help of Suleman et al examined the effectiveness of teachings by those who had passed in-service training courses. The results implied that such teachers didn't have the necessary method for using modern teaching techniques and technical skills and didn't criticize the lack of IT technologies in domain of education.

Basturk (2012) examined the effectiveness of in-service training courses among teachers of primary grades. The results showed the effectiveness of such courses. The results

of a study by Seo and Moon (2012) showed the efficiency of teaching and technical skills of teachers participating in such courses in comparison with non-participants (quoted by Basturk, 2012). Based on the above cases, the main objective of present study is to evaluate the effectiveness of in-service training courses on level of awareness among employees of Tondgooyan Petrochemistry Company so that effectiveness of such courses are revealed.

3. RESEARCH MAIN OBJECTIVE

Effects of In-service Training Courses on Awareness Level of Employees Working in Tondgooyan Petrochemistry Company.

Secondary Objectives:

- 1- Examination of Effects of Clients Reverence Courses on Increasing Awareness of Employees Working in Tondgooyan Petrochemistry Company
- 2- Examining the Effectiveness of Computer and IT Courses on Improving the Awareness of Employees Working in Tondgooyan Petrochemistry Company
- 3- Examining Effectiveness of Foreign-language Training Courses on Enhancing Awareness of Employees Working in Tondgooyan Petrochemistry Company

Research Questions

- 1- Are clients' reverence courses effective on improving level of awareness of employees working in Tondgooyan Petrochemistry Company?
- 2- Are computer and IT training courses effective on enhancing the awareness level among employees of Tondgooyan Petrochemistry Company?
- 3- Are foreign-language courses effective on improving awareness level of employees working in Tondgooyan Petrochemistry Company?

4. METHODOLOGY

The present paper is applied in its objective and semi-experimental in its method of data collection. In present study, three types of tests, designed by the authors, were used in pretest, post-test and questionnaire format. In order to test the research questions, covariance analysis test was used.

The validity of this questionnaire was verified by consultation with assistant professors which lead to correction and deletion of some questions so that for the final copy of questionnaire for evaluating the effect of in-service training courses 33 primary questions and 6 demographic questions were used. In order to support validity, the association between sub-scales and total score of questionnaire was analyzed through Pierson correlation coefficient which was $r = 0.864$ with level of error $p = 0.05$.

The reliability of questionnaire of analyzing the effectiveness of in-service training courses of clients reverence was confirmed by the value of r (i.e. $r = -0.808$) which were 0.859 and 0.728 for computer and foreign-language classes.

In order to verify the questionnaire of awareness level which consisted of 20 four-choice questions, retest method (pre-test and post-test) was used for which coefficient of Pierson correlation is $r = 0.539$ in 0.05 level of error.

In the present study, Cronbach's alpha was used to verify the questionnaire reliability which was reported as 0.988 for questionnaire designed for evaluation of effectiveness of in-service training courses. In the present study, sampling was done based on Morgan's table for data collection by which 201 individuals were chosen out of 420 participating employees but in order to obtain a better result, 220 employees were randomly chosen which led to collection of 202 filled in questionnaire.

Table1. Reliability Coefficients of Questionnaire.

Statistical Index	Verifiability	Coefficients
Scale	Cronbach's alpha	Error
Evaluation of Effectiveness of In-service Training Courses	0.988	0.894
Knowledge	0.981	0.985

- 1- **Methods of Descriptive Statistics:** Such as frequency table, percentage and bar diagram
- 2- **Inferential Statistics:** Such as ANCOVA single-variable covariance analysis

In order to analyze collected data, SPSS software was used. For all existing hypotheses, a level of significance of $\alpha = 0.05$ was obtained.

4. 1. Data Analysis

Findings Associated with Research Hypotheses:

Inferential findings which are associated with hypotheses of present study consisted of findings of single group T-test, Chi-square goodness of fit, univariate ANCOVA covariance analysis and $\alpha = 0.05$ was defined as the level of error for all variables of present study.

First Question:

Do training courses of clients' reverence affect the awareness level of employees of Tondgooyan Petrochemistry Company?

Table 2. Central Indexes and Distribution Scores of Awareness Level in Pre-test and Post-test of Clients Reverence Course.

Group		Number	Mean	SD
Level of Awareness	Pre-test	53	13.69	2.8
	Post-test	53	15.09	2.9

Table 3. Results of Univariate Covariance Analysis (ANCOVA) of Scores of Awareness Level of Staff Employed in Tondgooyan Petrochemistry Company.

	Sum of Squares	Degree of Freedom	Mean of Squares	F-test	Level of Significance	Eta ²	Test Power
No adjustment	104.281	1	104.281	24.522**	0.001	0.325	0.998
Awareness Level	144.933	1	144.933	34.082**	0.001	0.401	1000
Error	216.878	51	4.253				
Sum	12680.000	53					

** 0.01 Level of Significance * 0.05 Level of Significance

As shown in the above tables, f-test of pre-test stage is 24.522 which is statistically significant. This implies that there is a significant difference if no adjustment of means occurs. The value of calculated F-test (34.082) for the mean values of awareness level among personnel of Tondgooyan Petrochemistry Company in clients reverence courses had a 0.05 level of error in pre-and post-teaching periods. So zero hypothesis is rejected and the test is significant. The value of Eta² is 40 percent which means that there is a 40 percent difference between post-test and pre-test results of clients reverence courses in regard to awareness level of employees of Tondgooyan Petrochemistry Company. Statistical power is 1.00 which implies that the probability of mistake in supporting zero hypothesis is almost non-existing (type. 2 error). So, with a 95 % level of confidence, one can conclude that there is a significant difference between scores of awareness level of employees working in Tondgooyan Petrochemistry Company as verified in post-test and pre-test. This difference favors the effectiveness of clients reverence course in post-test period as shown in the mean scores of awareness level of employees working in Tondgooyan Petrochemistry Company. The above table shows that programs of continuous teaching are highly effective in enhancing the awareness level of employees working in Tondgooyan Petrochemistry Company as in clients reverence course scores of post-test compared with those of pre-test.

Second Question

Do training programs of IT and computer enhance the awareness level of employees of Tondgooyan Petrochemistry Company?

Table 4. Centran Indexes and Distribution of Scores of Awareness Level based on Pre and Post-test of IT and Computer Course.

Group		Number	Mean	SD
Level of Awareness	Pre-test	86	14.27	3.2
	Post-test	86	16.09	2.9

Table 5. Results of Univariate Covariance Analysis (ANCOVA) for Scores of Awareness Level of Employees of Tondgooyan Petrochemistry Company for IT and Computer Course.

	Sum of Squares	Degree of Freedom	Mean of Squares	F-test	Level of Significance	Eta ²	Test Power
No adjustment	290.349	1	290.349	52.809**	0.001	0.386	1.000
Awareness Level	259.412	1	259.412	47.182**	0.001	0,369	1000
Error	461.144	84	5.498				
Sum	22994.000	86					

** 0.01 Level of Significance * 0.05 Level of Significance

As it can be observed, F-test value of pre-test stage is 52.809 which is statistically significant. If there is no adjustment of means, there would be a significant difference. The calculated value of F-test (47.182) for mean values of awareness level of employees working in Tondgooyan Petrochemistry Company for IT and computer course before and after the test is significant when the error level is 0.05. So, zero hypothesis is not supported and the test is significant. Eta² value is 36 percent which means 36 percent difference, as a result of teachings, in the level of awareness of employees of Tondgooyan Petrochemistry Company due to IT and computer courses as shown difference of pre-test and post-test. Statistical power was 1.00 which means that the probability of mistaken support of zero hypothesis is about zero (type. 2 error). So with 95 % confidence, one can conclude that there is a significant difference between the mean scores of awareness level of employees working in Tondgooyan Petrochemistry Company for IT and computer course as shown in pre-test and post-test. This difference favors the average scores of awareness level of Tondgooyan Petrochemistry Company staff after IT and computer course after the end of teaching.

The above table shoes that continuous teaching programs are highly effective in enhancing awareness level of employees working in Tondgooyan Petrochemistry Company in IT and computer course after the teaching course is over.

Third Question:

Do foreign language training programs affect the awareness level of employees of Tondgooyan Petrochemistry Company?

Table 6. Central Indexes and Distribution of Scores of Awareness Level for Language Course Pre-test and Post-test.

Group		Number	Mean	SD
Level of Awareness	Pre-test	63	14.25	2.7
	Post-test	63	16.50	2.3

Table 7. Results of Univariate Covariance Analysis (ANCOVA) for Scores of Awareness Level of Employees Working in Tondgooyan Petrochemistry Company (Language Course).

	Sum of Squares	Degree of Freedom	Mean of Squares	F-test	Level of Significance	Eta ²	Test Power
No adjustment	351.415	1	351.415	69.152**	0.001	0.531	1.000
Awareness Level	33.756	1	33.756	6.643**	0.001	0.098	0.718
Error	309.990	61	5.082				
Sum	17512.00	63					

** 0.01 Level of Significance * 0.05 Level of Significance

As shown in the above table, value of F-test for pre-test is 69.152 which is statistically significant. This shows that without adjustment of values, the difference will be significant. The calculated value of F-test (6.643) for average scores of awareness level of employees working in Tondgooyan Petrochemistry Company during language course is significant within error level of 0.05. So, zero hypothesis is rejected and the test is significant. The square value of Eta is 9 percent which shows the difference generated by the effect of teaching of foreign language in improving awareness level of employees of Tondgooyan Petrochemistry Company compared with pre-test results. Statistical power is 0.718 which implies that probability of mistaken support of zero hypothesis is almost zero (type.2 error). So, with 95 % confidence, one can conclude that the average scores of awareness level of employees working for Tondgooyan Petrochemistry Company implies a significant difference between pre-test and post-test results. The above table shoes that continuous teaching programs are highly effective in enhancing awareness level of employees working in Tondgooyan Petrochemistry Company in language course after the teaching sessions are over.

5. CONCLUSIONS

Based on the first research question regarding the effect of teaching programs of clients reverence course on improvement of awareness level of personnel of Tondgooyan Petrochemistry Company, the results showed a significant difference between mean scores of awareness level of employees working in Tondgooyan Petrochemistry Company after clients reverence courses compared with pre-test results. This difference favors the average values of awareness level of personnel of Tondgooyan Petrochemistry Company when the clients reverence course sessions are over which means that plans of continuous teaching for improvement of awareness level of personnel of Tondgooyan Petrochemistry Company were highly effective when clients reverence sessions were over. The above results match those of Shahrani (2010), Tabatabai (2010) and Colabian (2010).

While for the third research question regarding the effect of teaching programs of language course on improvement of awareness level of employees working for Tondgooyan Petrochemistry Company, the results showed a significant difference between mean scores of awareness level of employees working in Tondgooyan Petrochemistry Company after language courses compared with pre-test results. This difference favors the average values of

awareness level of personnel of Tondgooyan Petrochemistry Company when the language course sessions are over which means that plans of continuous teaching for improvement of awareness level of personnel of Tondgooyan Petrochemistry Company were highly effective when language sessions were over. The above results match those of Handavi and Handavi (2011), Kordzangane (2011) and Orangi and Shahamat (2012) as well as findings of studies by Khanifar and Amir (2012) and Colabian (2010).

So based on the inferences of these findings, one could say better and stable learning is plausible by continuous education and enhancement of practical skills. The researcher used many factors to improve the quality level of courses and learning of employees. The following items should be mentioned:

- 1- The researcher asked expert scholars and professors to provide new and functional techniques for proper training of employees.
- 2- Enhancement of courses quality through proper usage of classroom facilities
- 3- Suitable session hours for training educational content and methods.

The above items led to an increase in individual capabilities, efficiency and learning of employees. In sum, these courses led to high awareness level in employees of Tongooyan Petrochemistry Company.

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