A Model For the Development of Employees' Learning (Career Path) in Industrial Enterprises

G. Chakamian Keshvari
Industrial Management Institute
Tehran, Iran

J. Mohammadi Faraz
Allameh Tabataba'i University
Tehran, Iran

N. Safaie
K. N. Toosi University of Technology
Tehran, Iran

S. J. Hosseini Nedjad
K. N. Toosi University of Technology
Tehran, Iran

Abstract—**The goal of this study is to propose a model for the development of employees' learning (career path) in industrial enterprises. In the research a descriptive-survey method along with field research were used. The statistical population consists of all 110 employees of Dana Baspar's enterprises. A questionnaire with content verified by 30 experts along with the supervisor and the advisor was employed. Related validity of the questionnaires and their stability were 70%, counted by Cronbach's alpha, showing a good level of stability. Descriptive statistics for demographic data (frequency, standard deviation and mean) and inferential statistics were used. Research findings show that the influence of workshop and experimental skills gained by apprenticeship, the effect of training by holding meetings and seminars with experts or experience acquired during work is significant and positive on organizational productivity while the mediation variable of professional skills exists but the influence of classic and academic trainings is not positive and significant on organizational productivity considering the existence of mediation variables.**

Keywords-learning development; career development; job skill; employees; career path; industrial enterprises

I. INTRODUCTION

The development of knowledge management and the increasing number of businesses that use modern management opens a new path of knowledge-based performance success, especially important in developing countries such as Iran. Adapting all business activities to all knowledge management elements at once may prove difficult as well as costly and time consuming. Thus, a gradual approach may prove better in helping employees to adapt themselves with modern work culture [1]. When an effective learning strategy is absent, problems such as learning prolongation, financial losses, accidents or even casualties caused by the lack of proficiency and reduced possibility of transmitting job skills are bound to occur. These problems obviously decrease the productivity and profitability [2]. On the other hand, to implement an effective strategy for organizational learning elements like the existence of a cooperative culture in every level and the presence of a capable leader to motivate and guide employees are essential. The results of such a process are however significant as a better working environment is combined with increased productivity. Therefore, the final result of this process is to create a vibrant, knowledge-based, fast-paced organization [3].

Establishment of compatibility between needs, abilities and potential capabilities of people on one hand, professional needs of organizations on the other are determining each employee's career path. The management of the progress of such paths is also known as organizational support and includes programs, processes and aids provided by an organization to support and increase the success of its employees in career progression. Such activities include a wide range of programs and interventions that compare the employees' and the organization's needs [4]. Among other things, developing job progress path programs provided by the organization result to a feeling of success for the employees [5]. This way, job satisfaction and loyalty will increase which is bound to result higher efficiency. It should be noted that other factors such as consultation, performance estimation and employee development programs may also be provided for that purpose [6]. It is natural for organizations to try to update and develop the skills of their employees and improve the individual, group and organizational learning level. Through such programs, the employees are expected to improve their theoretical background as well as their practical expertise, which should also provide increase work motivation [4].

People whose job progress is adapted to their needs and capacities try more to improve their knowledge and skills [7]. Thus, if the organization is able to provide two or three job preferences for each employee, they would be more stable in the organization. Authors in [8], proposed an example of the relations in job path with the focus on creativity/entrepreneurship, absolute, technical/functional and challenges in one group and with complimentary relationships by using Bristow's questionnaire. They claimed that the relation between security /stability and absolute changes is contradictory. Authors in [3], presented 5 types of process paths. The success in job progress is divided to two dimensions: objective and subjective [9]. The objective factors of job progress success have observable results such as paying, development and growth in job [10]. But subjective success of job progress is usually presented as the amount of job satisfaction in the job progress [11]. Authors in [12, 13] verified the relationship between training and the satisfaction of job progress and had referred to their relation [3]. Authors in

[14], found a positive significant relation between organizational support for job progress and the employees' satisfaction of their job progress. According to [15], support, encouragement, training, development and challenging jobs are effectively in relation with the satisfaction of women managers from the job progress. Authors in [16], found a strong relationship between the management support and the satisfaction of job path. Authors in [17] concluded that the management of job progress functions including estimation, development and training for job progress in the military department, have strong, positive impact on satisfaction in job progress. Authors in [18], described several variables as suitable explanations of job progress.

II. RESEARCH METHODOLOGY

The goal of this research is to propose a model for the development of employees' learning (career path) in industrial enterprises and to verify the relation between the considered variables. Therefore, the research type is quantitative and the method is descriptive, correlated and fundamental. Data are gathered through a questionnaire and are statistically analyzed. The statistical population consists of all 110 employees of Dana Baspar's enterprises. The statistical sample is the same with the statistical population, because the population is small. The questionnaire contains two parts: the first part consists of demographic questions such as gender, educational level and age. The second part includes 3 questionnaires (1. effective factors in job progress management 2. job loyalty in the way of progress 3. learning) by profiting Likert five point scale (from 1. "Absolutely disagree" to 5."Absolutely agree") and consists of 55 questions. The first questionnaire has 3 dimensions (job path satisfaction, management attitudes and management support) with 15 questions. The second questionnaire consists of 2 dimensions (scale of mental success in the job path and job loyalty scale). The third questionnaire includes 6 dimensions (academic and classic trainings, professional courses in technical and vocational organizations, experimental skills gained by apprenticeship, training by holding meetings and seminars with experts, online technologies and tutorials) and has 24 questions. The stability was 70%, counted by Cronbach's alpha, which is acceptable. Also the research validity is confirmed by 30 supervisors of knowledge management and some experts of industrial management institute.

III. FINDINGS

Data analysis of the research consists of two parts: descriptive findings and main findings. For data analyzing, the descriptive statistics are presented at first, verifying the variables. Then the inferential findings and the results of the hypotheses are proposed. At the beginning, a sample of 100 persons where chosen as the statistical population and their individual and demographic features were. Frequency and its percentage for gender, marital status, age, educational level, work experience, job title, department and income level are shown in Table I. Table II shows the descriptive indexes of the variables. The median of classic trainings variable is 2.250 that shows half of the data are less than this amount and the other half is more than it. The standard deviation for this variable is 0.601. It shows that the average amount of variability for classic trainings is about 0.054 around the mean. Skewness coefficient of this variable is positive, that means it's skewed to the right and the variables are tending to small values. If the kurtosis coefficient is more than 3, the distribution of the variables is more than normal and the data are around the mean. So it can be conducted that they are not distributed around the mean for the variable of classic trainings.

We used a two-step method of structural equations modeling for analyzing the hypotheses. Confirmatory factor analysis is done in the first step and if the measurement model is confirmed, we can perform the second step. Each latent variable forms a measurement model with the questions that test the same variable. Structural equations are sophisticated methods in data analysis: it's a developed linear equation that helps the researcher to measure a set of regression equations at the same time, collect data and enter them to the software package of structural equations. Structural equations develop the relation between the variables and have two main parts: measurement model and structural model, which are used for measuring latent and visible variables. They are introduced as one in the software and the final model. The software used in this research for analyzing is Smart PLS. Confirmatory factor analysis (Kaiser criterion) confirms that the data is suitable for factor analysis. The value of the statistic changes between 0 and 1. If the sample is suitable, the amount of this statistic should be more than 0.5 [19]. Here, the statistic is 0.724, so factor analysis is appropriate. The elemental correlation matrix is an identity matrix. In factor analysis, the correlation between the variables should not be zero, but if the correlation matrix is the same as identity matrix, it means that all the correlation coefficients are zero. If the Bartlett's test is significant, it means that the correlation matrix is not identity matrix and there is correlation between the variables and the factor analysis can be done [19]. Here, the value of significance is less than 0.05 thus the factor analysis can be used. The results are shown in Table III.

Considering the value of Cronbach's alpha, which is 70%, and according to [20, 21] the suitable fit for measuring models is confirmed. Therefore, according to Table IV, it can be contacted that the research modes are fitted very well. After the confirmation of the model, we can use and interpret the results of the path analysis in testing the hypotheses. This model shows the amount of correlation of the latent variables that are the conceptual image of the hypotheses in practice and in reality due to the observations and the data gained from the questionnaires. It also confirms how the hypotheses of the research would be rejected or accepted. The verification of the hypotheses with regression and determination coefficients will be discussed and it's results are shown in Figure 1 and Table V. Considering the determination coefficient amounts for the variables of professional skills and organizational productivity shown in Table V, that are respectively 0.95 and 0.968, regression models are suitable.

TABLE I. DEMOGRAPHIC FEATURES OF THE SAMPLES

Variable	Sub-variable	Number	Frequency	Accumulated percentage
Gender	Male	91	91%	91%
	Female	9	9%	100%
Marital status	Married	81	81%	81%
	Single	19	19%	100%
Age	21-24	9	9%	9%
	25-29	16	16%	25%
	30-34	25	25%	50%
	35-39	33	33%	83%
	40-44	8	8%	90%
	45-49	7	7%	98%
	More than 50	2	2%	100%
Educational level	Under diploma	25	25%	25%
	Diploma	42	42%	67%
	Associate	6	6%	73%
	Bachelor	23	23%	96%
	Master & higher	4	4%	100%
Work experience	5 years & less	45	45%	45%
	6-9 years	19	19%	64%
	10-14 years	31	31%	95%
	15 years & more	5	5%	100%
Job title	Operator	50	50%	50%
	Technician	19	19%	69%
	Supervisor/employee	9	9%	78%
	Expert	9	9%	87%
	Manager	8	8%	95%
	Departement manager	5	5%	100%
Department	Production	71	71%	71%
	Quality control	6	6%	77%
	Engenering	3	3%	80%
	Financial & Administrative	7	7%	87%
	Trading	11	11%	98%
	Management	2	2%	100%
Income level	Less than 1m	3	3%	3%
	1-1.5 m	52	52%	55%
	1.5-2 m	32	32%	87%
	2-2.5 m	7	7%	94%
	2.5-3 m	3	3%	97%
	More than 3 m	3	3%	100%

TABLE II. DESCRIPTIVE STATISTICS OF DATAS

Variable	Mean	Median	Standard deviation	Kurtosis	Skewness
Classic Trainings	2.297	2.250	0.601	0.054	0.811
Technical And Vocational Trainings	2.065	2.000	0.654	0.367	0.446
Apprenticeship Method	2.356	2.333	0.648	0.068	0.446
Learning By Holding Meetings With Experts	2.264	2.200	0.622	0.014	-0.260
Online And Tutorial Trainings	1.987	2.200	0.824	0.692	-0.084
Experimental learning	2.204	2.000	0.633	0.152	-0.006
Professional skill	2.386	2.233	0.622	0.080	-0.065
Organizational productivity	2.275	2.366	0.727	0.329	-0.0378

TABLE III. BARTLETT TEST

Kaiser criterion	0.24	
Bartlett test	Rotation test	26.205
	Signification level	0.000

TABLE IV. FIT INDICES

Index type	Index amount
Absolute index	0.664
Relative index	0.783
Exterior model index	0.825
Interior model index	0.906

TABLE V. DETERMINATION COEFFICIENT AND MODERATED DETERMINATION COEFFICIENT

	Determination coefficient	Moderated determination coefficient
Organizational productivity	0.950	0.950
Professional skills	0.968	0.966

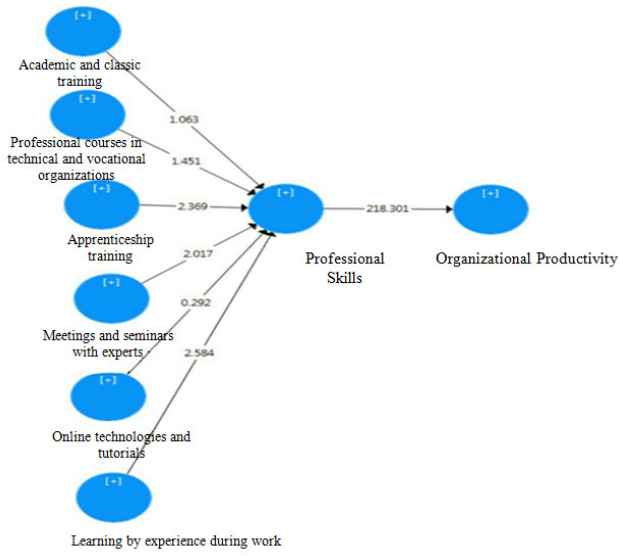

Fig. 1. Path coefficients

IV. VERIFICATION

In each hypothesis we tried to find the existence of correlation between some variables and professional skill and its correlation with organizational productivity. Regarding the second part, as shown in Table VI, the p value of professional skills' influence on organizational productivity is less than 0.05 (0.000), and the t value is more than 1.96 (t=218.301>1.96), so it's concluded that the influence of professional skills is significant on organizational productivity.

First hypothesis: The influence of classic and academic trainings presented by higher education institutions on organizational productivity is significant with the mediating role of professional skills' variable. According to Table VI, the p value of academic and classic trainings on professional skills is more than 0.05 (0.288). The t value for is less than 1.96 (t=1.063<1.96), so we can say that the influence of classic and academic trainings on professional skills is not meaningful to professional skills. As the relation between the influence of classic and academic trainings variable on professional skills, the first hypothesis is rejected.

TABLE VI. GENERAL MODEL RESULTS

	Relation	Path coefficient	t statistics	Signification level	Result
First hypothesis	Classic trainings → professional skills	0.055	1.063	0.288	Rejected
	Professional skills → organizational productivity	0.975	218.301	0.000	
Second hypothesis	Technical and vocational trainings → Professional skills	0.219	1.451	0.147	Rejected
	Professional skills → organizational productivity	0.975	218.301	0.000	
Third hypothesis	Apprenticeship method → Professional skills	0.293	2.369	0.018	Accepted
	Professional skills → organizational productivity	0.975	218.301	0.000	
Fourth hypothesis	Learning by holding seminars → Professional skills	0.171	2.017	0.044	Accepted
	Professional skills → organizational productivity	0.975	218.301	0.000	
Fifth hypothese	Online and tutorials trainings → Perfessional skills	0.293	0.292	0.77	Rejected
	Perfessional skills → organizational productivity	0.975	218.301	0.000	
Sixth hypothese	Experimental trainings → Perfessional skills	0.293	2.584	0.000	Accepted
	Perfessional skills → organizational productivity	0.975	218.301	0.000	

Second hypothesis: The impact of professional courses in technical and vocational organizations on organizational productivity is significant with the mediating role of professional skills' variable. According to Table VI, the influence of p value of professional courses in technical and vocational organizations on professional skills is more than 0.05 (0.147). Also by considering absolute value of t for each path that is less than 1.96 (t=1.451<1.96), we can say that the influence of professional courses in technical and vocational organizations on professional skills is not significant. As the relation between the influence of professional courses in technical and vocational organizations variable on professional skill, the second hypothesis is rejected.

Third hypothesis: The influence of workshop and experimental skills that are gained by apprenticeship on organizational productivity is significant with the mediating role of professional skills' variable. The influence of p value of apprenticeship training method is less than 0.05 (0.018). The

absolute value of t is more than 1.96 (t=2.369>1.96), so we can say that the influence of apprenticeship training method on professional skills is significant. As the relation between the influences of apprenticeship training method on professional skill, the second hypothesis is accepted.

Fourth hypothesis: The impact of the effect of training by holding meetings and seminars with experts on organizational productivity is significant with the mediating role of professional skills' variable. The influence of p value of the effect of training by holding meetings and seminars with experts on professional skills is less than 0.05 (0.044). Also by considering absolute value of t for each path that is more than 1.96 (t=2.017>1.96), we can say that the influence of the effect of training by holding meetings and seminars with experts on professional skills is significant. So the fourth hypothesis is accepted.

Fifth hypotheses: The influence of online technologies and tutorials on organizational productivity is significant with the mediating role of professional skills' variable. The influence of p value of online technologies and tutorial trainings on professional skills is more than 0.05 (0.77). Its t value is t=0.292<1.96, so we can say that the influence of online technologies and tutorial trainings on professional skills is not significant. As the relations are not significant, the fifth hypothesis is rejected.

Sixth hypothesis: The impact of learning by experiencing during work on organizational productivity is significant with the mediating role of professional skills' variable. The influence of p value of the learning by experiencing during work on professional skills is less than 0.05 (0.000) and t=2.377>1.96, so we can say that the influence of learning by experiencing during work is significant. So, the sixth hypothesis is acceptable.

V. DISCUSSION

The main purpose of this study is to propose a model for the development of employees' learning (career path) in industrial enterprises. According to the research findings, the overall results are:

- The influence of classic and academic trainings presented by higher education institutions on organizational productivity is not significant with the mediating role of professional skills' variable. Regarding the relation between the influence of classic and academic trainings on professional skill, the hypothesis is rejected.
- The impact of professional courses in technical and vocational organizations on organizational productivity is not significant with the mediating role of professional skills' variable. Regarding the relation between the influence of professional courses in technical and vocational organizations on professional skill, the hypothesis is rejected.
- The influence of workshop and experimental skills that are gained by apprenticeship on organizational productivity is significant with the mediating role of professional skills' variable. Regarding the relation between the influence of apprenticeship training method on professional skill, the hypothesis is acceptable.
- The impact of the effect of training by holding meetings and seminars with experts on organizational productivity is significant with the mediating role of professional skills' variable. So it's concluded that the influence of professional skills is significant on organizational productivity.
- The influence of online technologies and tutorials on organizational productivity is not significant with the mediating role of professional skills' variable.
- The impact of learning by experiencing during the work on organizational productivity is significant with the mediating role of professional skills variable.

Considering the results of the research, some suggestions can be proposed. According to the result of the first hypothesis, we have to try to make the academic trainings more compatible with the work environment. Also it's necessary to motivate the employees to benefit from their academic teachings to optimize the job processes. Considering the results of the second hypothesis, the applied job skills should be increased by providing specialized trainings in technical and vocational organizations. It's also recommended for the employees to be motivated to learn technical and vocational skills in the work environment. According to the third hypothesis result that confirms the influence of workshop and experimental skills that are gained by apprenticeship is significant on organizational productivity with the mediating role of professional skills' variable, we can improve this by increasing personal discipline, and also reduce equipment and device failure through apprenticeship. Besides, it's recommended to lead up the concepts of seniority in order to encourage senior employees to institutionalize learning culture by apprenticeship method. Based on the fifth hypothesis result that confirm the significance of the effect of training by holding meetings and seminars with experts on organizational productivity with the mediating role of professional skills' variable, the recommendation for development of this hypothesis is achieving the organization's goals, improving employee's performance, enhancing their creativity, responsibility and personal discipline through holding meetings and seminars with experts. Considering the result of the fifth hypothesis, motivating and encouraging employees to increase their knowledge of the job continuously, augmenting the self confidence in performing the tasks is suggested through online technologies and tutorials. Finally, considering the sixth hypothesis that says the impact of learning by experiencing meanwhile the work is significant on organizational productivity with the mediating role of professional skills' variable, we recommend asking employees to perform researches about the ways for optimization the organization's progress to achieve job promotion and to be contributed in economic benefits of the organization gained by their innovation and their promotional work for integrating this process.

VI. RESTRICTIONS

The most essential limitations of the current research are the following. Time and cost: As the skill-building process is a long-term process, it's results appear after a long time in the form of increasing organizational productivity so it is impossible to evaluate the final results during the project implementation. The high cost of this type of researches which sometimes last long can be an effective obstacle that prevent the researchers to follow-up and continue such projects. Human resources and general limits in Iran: Lack of capable and trained employees depending on the required level of job skills is another preventing factor in skill-building. Trust and belief in researches, working relationship between management and staff and also the absence of a secure environment like external threats causing the feeling of job insecurity is another major problem. Lack of incentive mechanisms and/or organization's chief's support and belief. Definitely without the support of the leadership of the senior management of the organization, this kind of projects would not be useful and will be just reports or non-functional articles.

VII. CONCLUSION

The current work focused on a model for the development of employees' learning (career path) in industrial enterprises. A descriptive-survey method along with field research, through a questionnaire, were used. The statistical population consisted of 110 employees of Dana Baspar's enterprises. Descriptive statistics for demographic data (frequency, standard deviation and mean) and inferential statistics are considered. Six different hypotheses are investigated and results are discussed.

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