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STRUCTURAL EQUATION MODEL OF TECHNOLOGY PROFESSIONALS TRAINING IN THE KNOWLEDGE MANAGEMENT

Dan Bai and Min Zuo*

College of Economics and Management
Dalian University
No. 10, Xuefu Ave., Dalian 116622, P. R. China
baidan@dlu.edu.cn; *Corresponding author: 731053091@qq.com

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Abstract. *Correct understanding of knowledge management scope is the key of technology professionals training in the knowledge management. On the basis of analyzing existing literature and empirical analysis, this paper builds a structural equation model of technology professionals training impact factors from four dimensions: knowledge management mechanism, human knowledge, marginal intellectual activity and organization structure. Use Amos22.0 to test the relationship and the intensity between these factors. The study shows that there is a significant positive relationship between the four dimensions and technology professionals training, in which knowledge management mechanism is the greatest impact factor, followed by the human knowledge organization structure and marginal intellectual activity.*
Keywords: Knowledge management, Technology professionals training, Structural equation model

1. **Introduction.** Nowadays, enterprise management has gotten into the stage of knowledge management. Meanwhile, as the most active purveyor of knowledge, talents have become the most important part in knowledge management. Drucker is the first people to propose the knowledge society and knowledge management, and pointed out that the knowledge-based business required being composed of technology professionals [1]. With the development of knowledge management, there are lots of researches about technology professionals training. These studies mostly stay in theoretical inference stage, lack of clear logic model analysis. Research of technology professionals training under the view of knowledge management is a relatively new subject and relevant research results are much less.

In this paper, a new method is introduced to study technology professionals training. Structural equation model (SEM) as a multivariate statistical method, which is based on the factor analysis, path analysis and regression analysis, can estimate a set of observed variables and latent variables as well as analyzing the relationship between the variables [2], which can identify the influence factors of technology professionals training accurately. Through introducing a new method and studying under the view of knowledge management, the proposed study can further enrich technology professionals training theory and put forward a new research method of technology professionals training.

2. **Problem Statement and Assumptions.** As the era of knowledge economy, the 21st century is a time, which technology professionals training in the view of knowledge management has significant impact on the sustained growth of the company. How to realize enterprises technology professionals training and which knowledge dimensions significantly influences technology professionals training are necessary to be solved.

Quinn et al. believe management of staff intelligent (This intelligence will be converted into useful products and services) is rapidly becoming the most important management

skill in today's society. Organizations with self-motivated creativity have much more significant competitive advantage [3]. They analyzed the importance of technology professionals training and pointed out self-motivated organizations and organizational decisions affect the training significantly in the view of organization. Later scholars continued to develop this organization structure into learning organization. Therefore, we have the following hypothesis.

H1: There is a positive correlation between organization structure and technology professionals training.

Dong and Lu said, "Organizations which involve knowledge management broaden the scope of intellectual activity and channel" [4]. Obviously, Dong make a description of the technology professionals training in a view of marginal intellectual activity. And actually we can use partnerships between technology enterprises with other enterprises and with other universities and institutions to analysis the marginal intellectual activity. Therefore, hypothesis is as follows.

H2: There is a positive correlation between marginal intellectual activity and technology professionals training.

Edwards [5], Kim et al. [6] and other scholars have an important role in knowledge management of the talents study. Their view states that the current mainstream view of knowledge management and considers knowledge management mechanism directly affects technology professionals training; the main aspects are integration of knowledge resources, knowledge management strategies and intellectual capital. Therefore, hypothesis is as follows.

H3: There is a positive correlation between knowledge management mechanism and technology professionals training.

Wang said, "Increase investment in human capital, mobilize human potential and learn from foreign companies experience to develop a competitive talents strategy" [7]. Jin and Wang said: "Intellectual Resources Management is a new research field which generates and develops between knowledge management and human resources management" [8]. These scholars from the perspective of technology professionals own talent demonstrates the factors of technology professionals training, including enterprises knowledge culture, knowledge investment and knowledge innovation. Therefore, hypothesis is as follows.

H4: There is a positive correlation between human knowledge and technology professionals training.

Therefore, this study will base on the above research and use four dimensions of knowledge management to empirically research the influencing factors of technology professionals training by SEM.

3. Data and Assumption Model.

3.1. Indicators and data.

According to the literature review in Section 2, we can get the indicators of technology professionals training in Table 1.

3.2. Assumption model.

By analysis above and using factors in Table 1, we constructed an assumption model of technology professionals training. As shown in Figure 1, the model consists of 4 exogenous latent variables, 1 endogenous latent variable (technology professionals training) and 16 observed variables (in which, Y_1 is the technology professionals' quantity and Y_2 is the technology professionals' quality). In addition, there are 17 residual variables (e_1, e_2, e_3, ..., e_{16}, z_4) which ensure that the model can be set up. H1, H2, H3 and H4 are the assumptions stated in Section 2.

TABLE 1. Indicators fixed by assumptions

Dimensions	No.	Indicators	Dimensions	No.	Indicators
Organization Structure	X_1	Self-motivated organizations	Knowledge Management Mechanism	X_8	Integration of knowledge resources
	X_2	Learning organization		X_9	Knowledge management strategies
	X_3	Organizational decision		X_{10}	Knowledge management process
Marginal Intellectual Activity	X_4	Partnership between technology enterprises	Human Knowledge	X_{11}	Intellectual capital
	X_5	Partnerships with other enterprises		X_{12}	Enterprises knowledge culture
	X_6	Partnerships with universities and institutions		X_{13}	Knowledge investment
	X_7	Competitiveness		X_{14}	Knowledge innovation

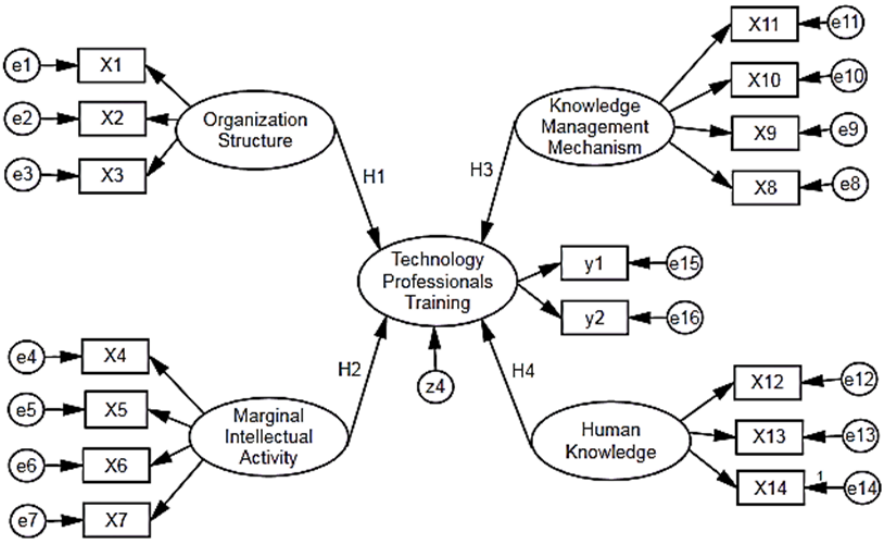

FIGURE 1. Assumption model of technology professionals training

4. **Structural Equation Model Application.**

4.1. **Effectiveness.** Establish structural equation model by using the example of Dalian Bonded Zone. After a review of relevant literature and an interview with zone managers, based literature reading Delphi method, the relevant members of the task force preliminary determine 14 factors of technology professionals training in knowledge management perspective, which is shown in Table 2.

A total of 300 questionnaires were returned of 286 copies and 271 valid questionnaires, and the efficiency is 90.6%. The reliability of the questionnaire data uses the Cronbach α to test. Generally Cronbach α values above 0.7 considered having good reliability, Cronbach coefficient of those factors is more than 0.7 which is higher reliability. During the Butler spherical test, P value is 0.756, showing that the model data is good for effectiveness.

4.2. **Structural equation model results.** Run Amoss22.0, using the revised structural model to test the impact of various factors on technology professionals training. The output of the corrected structural equation model is in Figure 2 and the optimal model path relationship estimates are in Table 3.

TABLE 2. Effectiveness of indicators and the factor loading matrix

Indicators	Mean	Std.	Cronbach α	Factor loading			
				1	2	3	4
X_1	4.20	0.71	0.825	0.886			
X_2	4.20	0.72	0.712	0.765			
X_3	4.23	0.68	0.756	0.764			
X_4	4.25	0.69	0.889		0.918		
X_5	4.14	0.73	0.794		0.862		
X_6	3.85	0.78	0.734		0.845		
X_7	3.61	1.00	0.792		0.762		
X_8	4.28	0.68	0.823			0.856	
X_9	4.12	0.82	0.761			0.847	
X_{10}	4.24	0.64	0.814			0.841	
X_{11}	4.05	0.67	0.902			0.795	
X_{12}	4.21	0.73	0.749				0.849
X_{13}	4.20	0.62	0.734				0.794
X_{14}	4.26	0.69	0.803				0.786

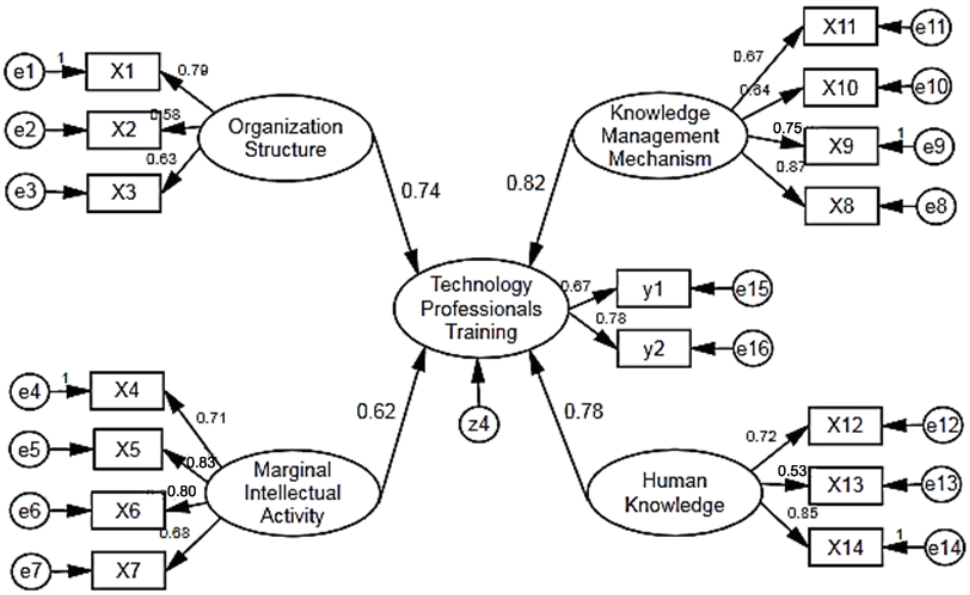

FIGURE 2. Assumption model of technology professionals training

TABLE 3. The model path system

Path Relationship	St	t	P
Technology professionals training <— Knowledge management mechanism	0.82	11.35	※
Technology professionals training <— Human knowledge	0.78	3.674	※
Technology professionals training <— Marginal intellectual activity	0.62	11.48	※
Technology professionals training <— Organization structure	0.74	6.534	※

Note: ※ means a significant level of 0.01.

4.3. **Results discussions.** As it shows in above table, there is a significant positive correlation between the four dimensions and the technology professionals training, the assumption of H1, H2, H3 and H4 is established. T value of path relationship is between $3.674 \sim 11.35$ (when the absolute value of t is greater than 2 or equal to 2, the path relationship can be identified of significant differences in the level of 0.05 or less), significant at the 0.01 level, these 4 dimensions are the impact factor of technology professionals

training. From each standardized value of path relationship, we can see that knowledge management mechanism is the maximum factor for technology professionals training.

5. **Conclusions.** By establishing structure equation model of technology professionals training under the perspective of knowledge management and analyzing the factors affecting, the results show that knowledge management mechanism has the greatest impact for technology professionals training, followed by the human knowledge, organization structure and marginal knowledge activities successively. Verifying the existing of mediating effect in the 4 dimensions and analyzing the hierarchical structure between influencing factors and technology professionals training should be the possible future research direction.

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