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Исследование эффективности процесса обучения работников микро- и малого бизнеса в научно-инновационной отрасли Дацина (с использованием метода моделирования структурными уравнениями)

Развитие микро- и малого бизнеса неразрывно сосуществует с процессом профессионального роста его работников. При этом факторы влияния на эффективность процесса обучения персонала достаточно разнообразны. На примере научно-инновационной отрасли микро- и малого бизнеса в Дацине исследуется процесс обучения, включая наставников, факторы влияния на эффективность этого процесса, показатели уровня обученности посредством метода опроса. Используя методику моделирования структурными уравнениями, авторы выявляют и анализируют основные факторы воздействия на показатели уровня обученности работников микро- и малого бизнеса. В статье предлагаются практические рекомендации всем, кто интересуется вопросами изучения эффективности обучения персонала.

Ключевые слова и словосочетания: метод моделирования структурными уравнениями, микро- и малый бизнес, эффективность процесса обучения.

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Investigation and Research on Training Effect of Small and Micro Enterprise Staff
in Daqing High-tech Zone Based on AMOS Analysis

The development of micro and small businesses can be separated from the training, but small and micro businesses impact training (effect) factors are complex enough. According to the Daqing high tech Zone micro-and small businesses as the research scope regarded are trainees, training, training effect factors, the establishment of the training index of four aspects of the current situation by making a questionnaire analysis. With AMOS analysis method applied, the questionnaire survey determines the main factors affecting small and micro businesses training. The authors give some practical recommendations.

Keywords: Amos, small and micro businesses, training effect

1. Introduction

In June 2011, the Ministry of Industry, the National Bureau of statistics of the small and medium-sized enterprises to be planned, first proposed the definition of small and micro enterprises. Since 70% jobs at present are provided by small and micro businesses, of great importance is the issue of improving the efficiency of small and micro businesses peopleware. Highlighted here is the suggestion how one should regulate the status of human resource management in small and micro enterprises in particular. Providing incubation platform is not sufficient any more. The city of Daqing as a resource-based city, with a non-oil economic development speed, does away with as soon as possible significant adverse consequences brought by the depletion of the oil industry. According to Daqing national high tech Industrial Park small and micro businesses advance due to the three level system with incubator nursery + accelerator. Plus information, technology, training, and business intermediary service platform perfect for small and micro businesses, their own human resources management system. The latter is aimed at supporting small and micro enterprises in science. An effective human resources management cycle is still an issue that cannot be ignored.

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As a necessary means of self-improvement and enterprise development training is what small and micro businesses are not ignoring today. It is not just enhancing staff skills means, but a way of enterprise culture establishment. Nonetheless, what does small and micro businesses training result in? What is the impact of the small and micro enterprise training effect? The project intends to obtain training content predetermined by the willingness of training, training effect questionnaire results in several aspects of small and micro businesses. Analyzed by Amos software, the questionnaire finds out the influence factors of training effect, the latter being investigated.

2. Analysis of the training situation of small and micro enterprises in Daqing high tech Zone

2.1. The concept of small and micro enterprises

Small and micro enterprises are added to the types of small, medium-sized and micro enterprises, collectively, in this country, individual industrial and commercial households as small and micro enterprises (SME). According to the draw type standards for SMEs, small and micro businesses include operating income of 5 million yuan of agricultural enterprises employing 300 people, operating income of 20 million yuan following the industrial enterprises with 100 people employed, operating income of 20 million yuan catering enterprises.

A large number of SME has become an important pillar of the national economy, and serves to be a solid foundation for [1]. State Administration for Industry and Commerce in March 31, 2014 for sustained and stable economic growth of small and micro businesses issued "national development report > display Chinese Small and micro businesses a total of 11 million 698 thousand and 700 households, the total number of enterprises accounted for an absolute majority of 76.57%. Small and micro businesses accounted for the main body of the market serve to be the basis for sustained and stable economic growth. Small and micro businesses also play an essential role in promoting social employment, with 70% of urban residents and more than 80% of migrant workers in employment. Thus, neglecting the development problem of small and micro businesses is not a wise choice. Pertaining to small and micro businesses there are lots of problems. In particular, small and micro businesses of industry cluster are in uneven distribution; local industrial cluster development level of market economy in underdeveloped areas is high; low degree of small and micro businesses scale; a weak anti risk ability by the external economic policy, environmental impact. Most small and micro businesses face the problems with the lack of market demand, orders; product sales difficulties. SME' industrial structure is low, mostly concentrated on the resources development, products processing. Regarding the service level based on traditional industries, small and micro businesses are less involved in the technology industry.

2.2. Development status in Daqing high-tech Zone

Daqing high-tech Industrial Park is the second batch of national high-tech Zone approved by the State Council in September 1992. It is the only domestic Chinese Park relying on petroleum and petrochemical industry and the establishment of the new district. As of May 2015, the city of Daqing reached 459 incubated enterprise, high-tech Innovation

Service Center – 241. These enterprises are covering petrochemical, biology, new energy, new materials and other fields. In 2009 there was approved starting the construction of the Northeast's leading, the Eleventh National Innovation Park. 2012 year reached GDP 55 billion yuan, industrial added value of 47 billion yuan, fiscal revenue of 4 billion yuan, with an increase of 30%, 35% and 33% respectively. Of the existing types of nearly 3000 enterprises there is one of more than 400 high-tech enterprises built-in Daqing branch, in blue petrochemical, and a number of output values of 1 billion yuan enterprises, 13 enterprises in the domestic and foreign market. The construction of Northeast Petroleum University and other colleges takes a lead in 3, Daqing branch of Heilongjiang Academy of Sciences and other research institutes (13). Above the provincial level of R&D center and Key Laboratory (31), there was built a new industry incubator, a post doctoral research station, the returned overseas Students Pioneer Park incubator innovation carrier with the construction area of about 500000 square meters. Moreover, there took place the cumulative development of 53.61 square kilometers of land, with the construction area of about 17000000 square meters. A set of industrial economies, commerce, scientific research and education, entertainment and other functions being integrated into a new modern city as one of the scale.

2.3. Training status in Daqing high-tech Zone

So far, the Daqing high-tech Zone every year conducts a large-scale training including ten games usually dominated by large special report. The training content is primarily concentrated in the small and medium-sized enterprise patent training, training itself, training of technical market listing, and preferential policies. Ensure every 200 companies to participate.

In the training object, including not only the high-tech Zone under the jurisdiction of the enterprise, is more focused on economic and investment departments of leading cadres, including the administrative committee, the Union Party members of the team, leading cadres above the middle, economic investment department of the business backbone, outstanding young cadres and high tech entrepreneurs and senior management personnel, to improve their scientific the ability to judge the situation, the ability to control the market economy, the ability to deal with complex situation, the ruling capacity and overall ability.

In the training of teachers, high-tech Zone has become the choice of experts and scholars from universities, domestic professional training top-notch talents, with its rich highend training experience. The latter enables the trainees to broaden their horizons, enrich knowledge, renew ideas, and open new thoughts.

3. Small and micro enterprises impact factors of training

3.1. Questionnaires making

According to the results obtained through the analysis of small and micro businesses training, projects team integrated a survey questionnaire. The questionnaire is based on the AMOS model fitted up with the four first level indicators, including trainees, training form, influence (impact) factors of training, training of four aspects of the status quo. The questionnaire consists of 12 questions.

Survey of training in Daqing high-tech Development Zone

Level Indicators	Secondary indicators
Trainee type	1. gender
	2. age
	3. academic degree
	4. position
Training Form	5. frequency/year
	6. time quantum
Impact factors of training	7. desire
	8. organizational importance
	9. previous training evaluation
Training status	10. pioneering and interdisciplinary research
	11. effectiveness
	12. Is it a system&

3.2. Questionnaire analyses

A questionnaire for high-tech Zone 500 small and micro businesses, with regard to the willingness of the training effect, resulted in 473 valid questionnaires. Among them there are 95 boys, 378 girls, with the proportions 20.08% and 79.92%, on the basis of using SPSS22.0 statistical analysis software to establish effective analysis database, confirmatory analysis using the AMOS21.0 platform for structural equation in the model, influencing factors of high tech Zone small and micro businesses training effect, and current situation of the conclusion.

In view of these factors, the use of SPSS clone Bach coefficient reliability analysis of the survey results in Table 2. The evidence proves that the reliability coefficient of each potential variable is greater than 0.7, indicating that the scale is of good reliability.

Reliability analysis based on SPSS

	Cronbach`s Cronbach	Standardized of Cronbach`s Cronbach	Number of terms
Influence factors of training status	0.799	0.796	3
	0.916	0.916	3

AMOS structural equation model serves to be the basis to explore the causal relationship between things to variables, and the causal model, path map form being described. In the graph, the rectangles represent variables, ellipse − hidden variables, single arrows indicate individual effects or causal relationship. Using AMOS software rendering training will influence factors of a structural equation model and according to the analysis results obtained, the training will influence factors of structural equation diagram, and ultimately the formation of structural equation, as showed in Figure 1.
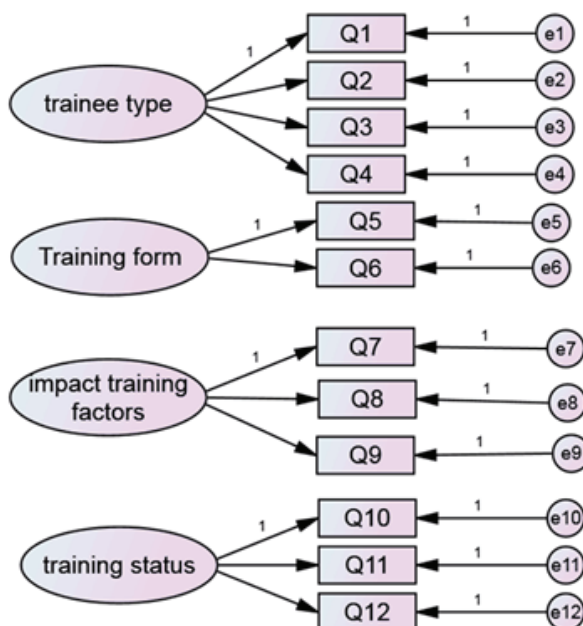
Fig. 1. *Structural equation model of influencing factors of training intention*

After combing the structural model, it appears to fit up with the questionnaire results. According to Table 3, each latent variable (trainee type, training form, influence (impact) training factor, training situation) is shown in the table.

Table 3

Parameter estimation between latent variables of training willingness impact factors

The relationship between latent variables	Standard evaluation	Standard error	Critical value	P	Label
Trainee type<--- academic degree	.469	.089	7.522	***	par_3
Training Form <--- time quantum	.339	.129	2.62	.009	par_6
Impact factors of training<--- desire	.568	.266	2.13	.033	par_7
Impact factors of training<--- Organizational importance	.849	.487	- 1.33	.183	par_8
Impact factors of training<--- Previous training evaluation	2.623	1.07	2.45	.014	par_9
Training status <---pioneering and interdisciplinary research	.457	.098	4.68	***	par_10
Training status <-- effectiveness	.504	.087	5.76	***	par_11
Training status <--- Is it a system?	.207	.125	1.66	.097	par_12

The study revealed that:

The influence of perceived value on customer satisfaction is relatively large;

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The standard error fluctuates between 0.087–1.07, the index being under a strong explanatory power for the measurement model. From the model of feedback, as you can see, training will organize the degree of attention, and on previous training the impact assessment of training effect is the most significant one.

4. Conclusions

4.1. Training Impact Factors Analysis

According to the results of a questionnaire survey and in face-to-face interview of a certain proportion of staff in high-tech Zone, the main factors that affect the SME staff training for training will organize the degree of attention, and the evaluation of previous training.

1) Desire to train

The training will reflect the trainees to the training initiative. From the questionnaire and findings of the face to face interview, new recruits (entry 1 year), 3 years after the entry of the training will be relatively strong. This is mainly because just recruits new-comers and not engaged in this industry for some the work, even if engaged in the skilled work, some awareness of school knowledge structure and entry after fault, stimulate the willingness of training. In the past year, after 3 years of the employees having become familiar with their work, their based training will weaken. In the past 3 years, later, most people have a desire for promotion or change the work demand. There arises the demand for training again in the form of training. Since the majority is concentrated on the form of teaching, the trainees, and the training will affect the degree of investment. So the impact on the training effect will grow.

2) Organizational importance

Organization degree of attention refers to the trainee's organization, the degree of attention to training. The majority of the participants' demands for training are based on the need of their work, so that organizations attach importance to the organizations need skills. For some enterprises, one could even participate in industry training of employees in the promotion, etc. There are some incentive measures, thus, affecting the training results. Some employees participate in the occupational skills training for occupational qualification enterprises may be more recognized by. So there is a certain incentive for employees, thus, affecting the training effect.

3) Evaluation of past training

Evaluation of previous training directly affects the trainees' new training expectations, and their enthusiasm of training. According to the interview report, once the majority of workers participated in the training, all of them (as far as is possible with the training process) actively improve themselves. The main reason for the low training effect is that workers have not been able to participate in the training, some of which − because the company cannot match the time, some enterprises do not pay attention to their employees taking part in training, so they do not participate in the process. Therefore, evaluation of previous training is low, many workers will choose to participate in the training of intermittent or simply give up.

4.2. Suggestions

The integrated analysis of enterprise personnel training factors in high-tech Zone is based on low (for this stage of training) effectiveness of overall satisfaction. The main reason is some training content is less needed or requires some more time to respond to. But the employees for the training itself are not exclusive. Even many workers expressly require training, though in the form of a specific training content, with a certain preference.

The proposed training for SME respond to the following points:

1) Investigation and concentrate on Industry Training

The demand within the same industry is similar. Though being not able to make full training, trainees themselves cannot control the training content, thus affecting the training effect. Essential here is the investigation before training, so that the latter feeds up with the employees' topic of interest. Such kind of effect proves to be better.

2) Diversified forms of training

The traditional teaching mode intends to provide the occupational skills training. The training should be a little behind the form to case training, industry salon and other forms. Let more trainees participate empathy. Encourage the trainees to express their ideas, so as to further identify the training needs, one can herewith stimulate additional trainees' ideas, training the effect of the upgrade.

3) Feedback on training effectiveness

If there is not any training assessment, it is not complete. Any training feedback needs to correct the effect of the training program under the guidance of an enterprise. There should take place the evaluation of training effect with the obvious effect of training. Continue to maintain or even increase the employees' participation incentive intensity, so that the training effect should be consolidated.

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