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# Training system design for middle-level manager in coal enterprises based on post competency model

Xu Hong-hua<sup>a</sup>, Wang Yan-hua<sup>b,\*</sup>

<sup>a</sup>*School of Management, China University of Mining and Technology, Xuzhou 221116, China*

<sup>b</sup>*School of Management, China University of Mining and Technology, Xuzhou 221116, China*

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## Abstract

The competency of middle-level managers is directly related to the future and the development of enterprises. How to improve the management level of enterprises' middle-level managers through training has become one of the urgent problems to be solved for many organizations. Based on the study of competency and competency model both at home and abroad and on Delphi and reverse Delphi methods, we formulate a preliminary generic competency model of middle-level managers in coal enterprises; on this basis, we design a training system aiming at improving the post competency of middle-level manager in coal enterprises according to the development process of training system.

*Keywords:* competency; competency model; training system

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## 1. Introduction

For a long time, little attention has been paid to the middle-level manager' role in the enterprise while most related researches has also concentrated on the high-level managers before. In fact, according to a survey conducted by the McKinsey Company, the key factor that some companies can maintain sustainable development and reform and achieve higher performance is not the senior managers, but rather a batch of middle-level managers who possess the talent of reform. As the backbone of enterprises and the executor of corporate strategic planning, the middle-level managers are increasingly concerned by the enterprises.

How to bring the middle-level managers into full play and improve their implementation capacity has become a key issue closely related to enterprises' success or failure. As people are increasingly becoming the core of enterprise management, the research on the link between intrinsic quality of people, including the knowledge, skills, behavior, personality trends, and inner drive etc. and the work performance is ever-deepening, and human resource management based on competency model is increasingly concerned by theory and practice circles. This paper just complies with this context, explores the training system design about middle-level managers based on the enhancement of post competency.

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\* Corresponding author. Tel.: +86-516-83883008.

E-mail address: [xhh691@163.com](mailto:xhh691@163.com).

## 2. Concept and connotation of competency and competency model and research review

### 2.1. *The concept and connotation*

Both the theory researchers and managers have encountered many difficulties on how to give a precise definition to competency. There are many divergences in the existing concept of competency, and different researchers put forward their own definition from different research point of view. Typical views are:

- Competency is a mixture of knowledge, skills, abilities, motivations, values and interests etc. (Fleishman, Wetrogen).
- Competency is any measurable individual characteristics that can distinguish excellent members from general members, such as motivation, characteristics, self-concept, attitudes or values, knowledge, cognitive or behavioral skills of some field. (Spencer, 1994).
- Competency is a wide range of characteristic groups including knowledge, skills, abilities, traits, attitudes, motives, behaviors and otherwise, which can make a person to finish work in a resultful way, and this characteristic can be measured according to acceptable performance standards. (Helley, 2001).

It can be seen that the definition of competency differs, and it is very difficult to form precise standards for the definition of this term. Why the definition of competency is so different? Studies have shown that the term "competent" or "competency" has been widely used in psychological literature in the early years. Part of these terms originated in the law and then was applied in clinical psychology. Later, the "competency" has been cited in the field of career counseling for defining some employment-related knowledge and skills. Although the theoretical study of the definition of competency concept are very different, domestic scholars and managers who use competency are more inclined to use the concept of competency given by Spencer in 1994.

### 2.2. *The concept and connotation of competency model*

Competency model is the sum of competency elements required in accomplishing a particular task-role. The construction of competency model is based on the competency of human resource management and logical starting point of development and application model, and, to a large extent, it is the important foundation and technical precondition for the effective implementation of all functions of human resource management and development[1].

Now the universally accepted theoretical basis is Iceberg Competency Model and the Onion Model. Iceberg Competency Model believes that competency can be divided into the following sections: knowledge, skills, social roles, self-recognition, traits, and motivations.

In summary, competency and competency model in this paper is explained as follows:

Competency is a set of various personality characteristics that can drive staffs to produce outstanding work performance, it reflects the knowledge, skills, personalities and inner drives etc. that can be expressed through different ways. There are three important features:

- It is closely related to work performance, or even can predict the future performance of staff;
- It is associated with working scene and is dynamic;
- It is able to distinguish excellent performance members from general performance members.

Competency model is the sum of competency elements required in accomplishing a particular task-role. Three elements are mainly included, namely the name of competency, the definition of competency (the key characteristics of defining competency), and the behavior indicators (reflecting competency's differences in behavior and performance).

### 2.3. *Research review on competency of managers at home and abroad*

In 1982, Richard Boyatzis carried out a comprehensive analysis of competencies of more than 2000 managers in 41 management positions of public utilities in 12 industrial sectors and private enterprises and concluded a generic competency model of managers. He analyzed the competency model's difference in different industries, different departments, and different management levels and proposed that managers' competency model included 6 character groups: 1) objectives and action management, 2) leadership, 3) human resource management, 4) guiding the

subordinates, 5) concerning about others, and 6) knowledge.

The former president Lyle.M.Spencer of Pre-Meber&company consulting firm once carried out a research on more than 200 types of work in 1989, trying to find factorial structure of job competence that managers generally possess[2]. He summarized 360° act issues, narrowed it down to 21 competency factors. Finally, he set up a general industry competency model including 5 major categories: 1) technical personnel, 2) sales personnel, 3) social service personnel, 4) managers, and 5) entrepreneurs, with each model of competency including about 10 competency characteristic factors.

Mount (1998) used "management skills profile" measurement tool developed by personnel decision-making International (PDI) to measure 250 managers. As a result, they got three dimensions of management competency: 1) interpersonal, 2) managerial, and 3) technical skills.

Nordhang (1994, 1998) proposed his own theory of competency classification. In his view, the division of competency should be carried out in three dimensions, which were 1) task concreteness, 2) industry concreteness, and 3) company concreteness. He divided the competency into six types: 1) Meta competency, 2) general industry competency, 3) internal organization competency, 4) standard technology competency, 5) technical industry competency, and 6) specific technology competency. American Management Association (2000) carried out a survey of 921 managers in management skills and management competency and divided management competency into four dimensions: 1) conceptual skills, 2) communication skills, 3) efficiency skills, and 4) interpersonal skills.

Based on research on competency for more than three decades, Hay Group Company led by McClelland established competency model library and kept perfecting it through branch companies around the world[3].

In China, although the research on competency started later than foreign countries, numerous researchers, government agencies, and institutions have engaged in these researches. Wang Chongming(1999) put forward the competency-based management and development the model under a cross-cultural context in four dimensions: 1) cultural competency, including cultural regulation and relationship management; 2) achievement competency, including organization ability, control capability and achievements management; 3) decision-making competency, including the risk and responsibility taking as well as complicated decision-making; and 4) team competency, including the group of compatibility and the use of team resources. In his view, management training programs could be designed through the development of cross-cultural team leadership competency model[4].

Shi Kan, Wang Jicheng(2002) used behavioral event method to conduct empirical research on management staffs' competency of China's communication industry. The result shows that the management staffs' competency of China's communication industry include 10 competencies: 1) influence, 2) social responsibility, 3) research ability, 4) achievement desire, 5) ruling ability, 6) interpersonal insight, 7) initiative, 8) market awareness, 9) self-confidence, and 10) human resource management capacity. This study obtained almost the same competency model as that of the West management[5].

Shi Kan, Zhong Lifeng (2003) carried out an empirical research on the competency of our family enterprise, built a competency model of managers in the communication industry and family enterprise, including 11 competency characteristics: 1) authority orientation, 2) initiative, 3) capturing opportunities, 4) information seeking, 5) organizational awareness, 6) wisdom, 7) mercy care, 8) self-control, 9) self-confidence, 10) self-study, and 11) impact on others, in which authority orientation and humane care were the unique competency of our senior managers in family enterprise[6].

Given that different positions in different sectors have different requirements for the competency model. Therefore, a campaign of competency modeling closely integrated with the industry is held at national level[7]. Xu Jianping (2005) constructed a model of teacher competency. Huang Xunjing, Li Guangyuan & ZhangMinqiang (2006) built a competency model of president of the commercial Bank at home for the first time. This model has not only some similarities with the general management competency, but also its uniqueness, which fully reflected the characteristics of the financial sector that president of the commercial bank subordinated too[8].

### **3. Competency Model building for middle-level managers in coal enterprises**

Determining the competency model for Middle-level managers is the key to build competency-based training system of enterprises. Competency modeling is to give comprehensive assessment and analysis to individuals through scientific methods and procedures, determine the initial indicators of competency, and finally test and determine competency model. It is not the development of pure theory project, but the actual business practices

related to operation. Scope, processes, tools, methods in modeling differ for different companies. Therefore, the key issue is whether the competency model can combine the concept of the model with practical enterprises.

When competency model development seminar is carried out, senior enterprise leaders and development project team members should reach a consensus recommendation to take appropriate measures (such as the inverse Delphi method) to construct model in accordance with corporate strategic planning, organizational structure, capacity, and other factors. Based on literature research and scholars' executed research model, this paper first analyzed middle-level managers in coal enterprises in four aspects: 1) strategy, 2) internal processes, 3) operations, and 4) culture, then determined preliminarily 20 competency indicators.

Table 1. Competency model for middle-level manager in coal enterprises

Name of Competency	Definition of Competency
Strategic Consideration	Based on enterprise's core ideas and strategic goal, through analysis of much information, grasping business field's status and trend, proposing strategic significant recommendations and measures.
Analysis and Judgment	Collecting and analyzing related information, proposing several candidate actions or measures, choosing the best solution in accordance with present status from which by use of knowledge and experience.
Plan Execution	Making feasible action plan based on goals and task requirements, Coordinating and using various resources effectively, ensuring the plan's successfully execution and realization of the targets.
Customer Orientation	Being good at grasping clients' needs, communicating with customers effectively, willing to offer customers with high-quality products and services and dedicating to maintain and promote clients' satisfaction.
Professional Ability	Mastering the knowledge and skills required by related industry and job, and using them in the work.
Communication Influence	Adopting various communication ways, transferring key information accurately and clearly, meanwhile, gaining all parties' promises and supports, overcoming any possible communication barriers.
Cooperative Spirit	Willing to share knowledge, information, resources, responsibilities and achievements with others, establishing cooperative relations based on mutual trust through various means.
Team Management	Establishing duties and goals for the team members in accordance with the overall objectives of the team, inspiring and guiding them in work, and continuously improving team cohesion and combat effectiveness.
Honesty and Reliable	Adhering to the principle in work and upholding professional ethical standards, expressing somebody's opinions objectively and fairly, keeping the promises; and willing to scarify in safeguarding the interests of the company.
Initiative	Setting up challenging goals initiatively or willing to take on additional tasks, persisting constantly in reaching goals and tasks even in the face of difficulties.
Leaning and Innovation	Actively seeking and grasping the opportunity to learn and improve their own abilities, and using knowledge and in work practice.
Standard Concept	Understanding the standardization's important role on coal manufacturing enterprise, promoting the development of each work in accordance with the standards in practical management.
Safety Consciousness	Observing strictly relevant safety production regulations in the producing and management and establishing global safety awareness.
Quality Control	Understanding production processes/process steps or results of the work plan to some extent to ensure achieving the desired results.
Cost Control	Making output income is greater than cost during work, and actively looking for ways to reduce cost.
Achievement Orientation	Exhibiting a willing to do a good and perfect job on behavior, Being inclined to take some standards on themselves that they assert.
Pressure Management	Maintaining original standards under pressure, no matter what kind of difficult tasks or social pressure would be.
Organization Coordination	Organizing human, finance, material and other related resources predictably according to plan, overcoming process barriers, reflecting issues to relevant parties timely and reaching an agreement.

In order to verify the conformity accuracy between these indicators and enterprises, meanwhile, to avoid individual subjective consciousness, expert method was used to verify them again, and supplemented by appropriate amendments. After three rounds of Delphi, we deleted overlapping indicators, added indicators with industry characteristic, obtained a list including 18 key behavior descriptions of competency, and finally built the

competency model about middle-level managers in coal enterprises. After completing the development of competency model, the author carried out verification on validity to ensure the accuracy and reliability of the model. Competency is relatively stable during a certain period in general, which is closely related to individual annual performance. It is a relatively suitable method to regard individual annual performance as validity verification indicators of the model. Therefore, the author extracted performance appraisal data of 10 middle-level managers in the past three years to carry out verification, Judged and evaluated the model's effective level by comparing tested person's performance appraisal status in the latest three years. The established competency model was proven more effective (Table 1).

#### **4. Training system development about middle-level manager in coal enterprises based on competency**

Training based on competency analysis and design is mainly about key competency requirements needed by staffs, which is focused on the outstanding characteristics of high-performance members than general performance members. The training is aimed at enhancing staffs' ability to gain high performance, adapt to the future environment, and develop their potential of competency. Pursuit of profit is one of the important enterprises' goals, while competency-based training is to improve the competitiveness of enterprises in order to obtain high profits through improving employee performance[9]. Another great advantage of competency-based training is to reduce the cost of training, that is, by making clear the staffs' gaps in competency, the training becomes more objectiveness.

Schematic diagram of competency-based training development system process is shown in Figure 1 (a).

##### *4.1. Training requirement analysis for competency-based middle-level managers*

Training requirement analysis is a kind of activity or process to determine the need for training and training content through systematic identification and analysis of various organizations and their members' performances, competency levels, career desires and otherwise by training departments, executive officers and other staff using various methods and techniques. Training requirement analysis is necessary when the knowledge, skills, innovation and quality of staff in enterprise and organization can not meet enterprise's development objectives and requirements. Therefore, training requirement analysis is the premise of determining the training objectives and designing training projects, it is also the basis of training assessment[10].

The first thing in training middle-level managers is to determine training requirements. Only when the urgent need in human resources development and training is made clear, can the training be an objective-oriented one.. Competency-based training requirements analysis is shown in Figure 1 (b)

What is needed to explain during the course of constructing competency model is that the organizational requirement analysis and task requirements analysis has been carried out simultaneously. Because the proposition of competency indicators are just based on the elements like organizational culture, internal and external environment of enterprises, we focus on the design of individual training requirements to make person and post matching during training requirement analysis.

After explicating the gap between middle-level managers and competency model based on competency model, human resources department can develop an appropriate training programs referring to gap so as to make up for gap in these capabilities. In general, whether middle-level managers need training or not depends largely on two aspects: First, whether there is a gap between the current competency level of middle-level managers and post competency requirements; Second, whether the current competency level of middle-level managers will get new requirements required by new jobs. It is possible to judge whether the competency level of middle-level managers is suitable for the competency requirements of the current posts by controlling behavior style and performance level of middle-level managers and organizational expectations. Therefore, competency-based training requirement analysis gives consideration to the common needs of organizations and individuals, which is a win-win model.

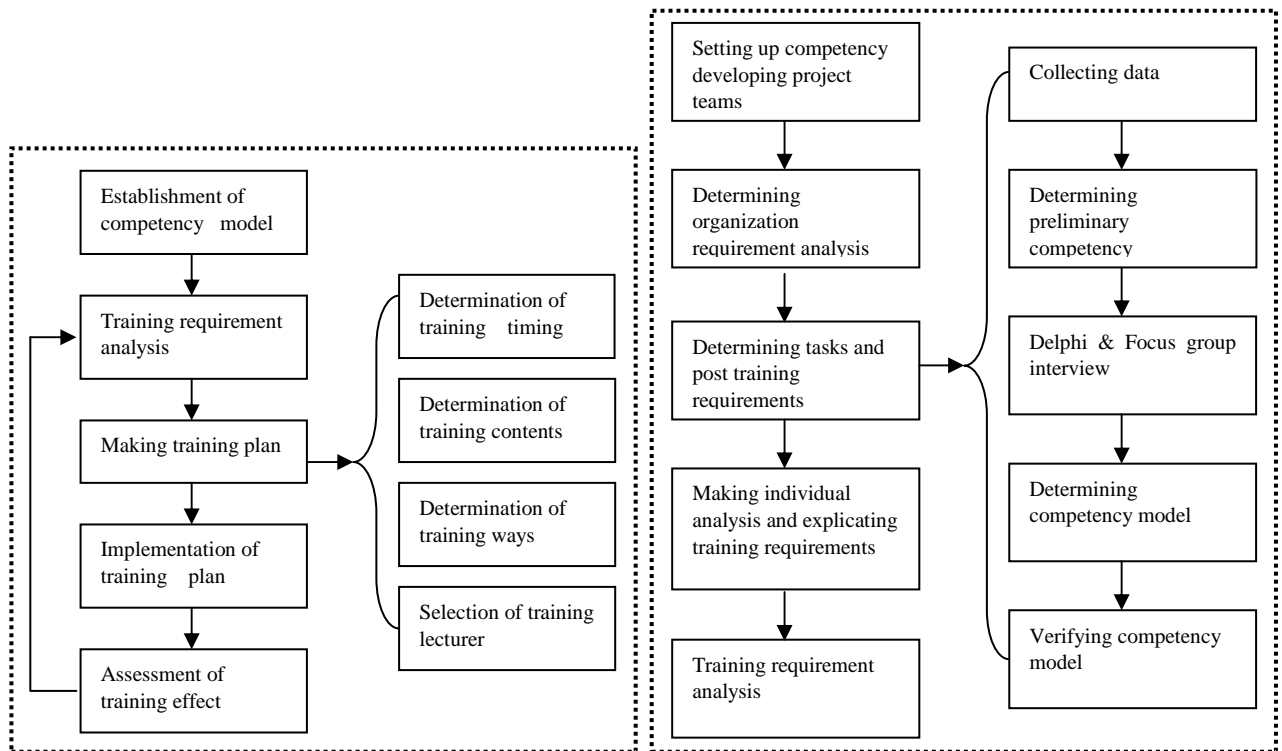


Fig. 1. (a) Schematic diagram of competency-based training development system process; (b) Diagram of Competency-based training requirements process

#### 4.2. Establishment of Competency-based training programs for middle managers

Training program, as a part of enterprise training, determines the success of the whole training process. Establishing a detailed and practical training program can ensure the smooth development of training and improve the quality of training. It is time for entrance to design and implement training and development program phase after a sufficient analysis on training requirements. Contents of training and development plan include follows:

- Determining goals of training and development
- Establishing the type of training
- Arranging for training time
- Determining the mode of training
- Setting up training course system

#### 4.3. Implementation of competency-based training programs for middle managers

It is the time for official operational phase of training programs after its establishment. The goal of training may not be realized and contradictions between each work in cooperation and cohesion may also appear unless there is a strict control on training implementation plan. Therefore, training implementation plan should be controlled after training programs have been established. The main criteria lie in whether the training implementation plan is in line with the conditions needed by the achievement of objective. Specific implementation steps are shown in Figure 2 (a).

#### 4.4. Effect assessment of competency-based training for middle-level managers

Assessment of training and development is the last step of a complete training and development process. It can

not only evaluate and summarize the implementing effect of whole training and development activities, but also provide important information for the next training requirements analysis.

Effect assessment of training process and assessment model are simply summarized in Figure 2 (b).

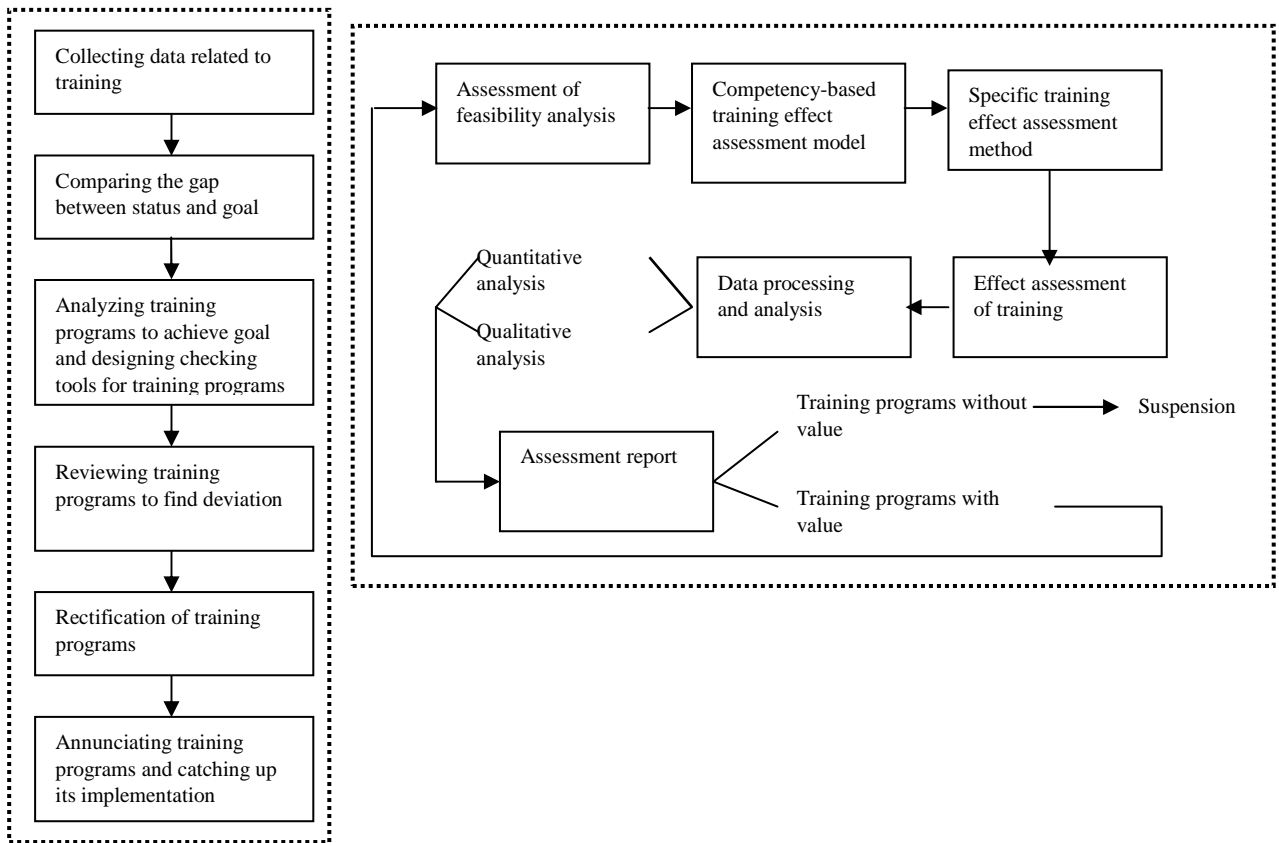


Fig. 2. (a) Implementation steps of training programs; (b) Effect assessment of training process based on competency

## 5. Conclusions

Different from the common training system based on post, Enterprise's training system based on competency can make the training programs for middle-level managers be made-to-measure, highlight major points of training, help middle-level managers make up their own "short plank", leave out the complicated steps of analyzing training requirements, put an end to unreasonable training expenses, improve the effectiveness of training, and create more wealth for the enterprise. Another feature of competency-based training is able to reduce the costs of training, which will make the training be more objectiveness.

It is clear to find differences between training of competency-based middle-level managers and traditional training through the introduction of competency theory and competency model into the staff training of enterprise's middle-level managers. Traditional training is based on job analysis. In this situation, the scope is rather narrow for it is limited in imagery content such as knowledge and skills. While competency theory starts from analyzing the characteristics of outstanding performance members and general performance members, with the covered content being relatively broad, including particularly some potential content that cannot be found by job-analysis-based demand assessment method. Moreover, competency theory starts with performance differential analysis, which makes the validity between analytical conclusion and performance be closely related. So this new theory may be used to improve the existing techniques and methods in training requirement analysis so as to develop corresponding training methods and training effect assessment techniques.

## References

- [1] L.Ye, W.J. Zhang and W.S. Jiang, Research on management competency. *Soft Science in China*. 2003 (11):96-99.
- [2] L.M. Spencer and S.M. Spencer, *Competency at work: models for superior performance*. New York: John Wiley & Sore.1993.
- [3] McClelland. Testing for competency rather than for intelligence. *American Psychologist*. 28 (1973) 1-14.
- [4] C.M. Wang and M. Chen, Characteristic analysis of management competency: Checking in Structural Equation model. *Psychological Science*. 5 (2002) 513-516.
- [5] K. Shi, J.C. Wang and C.P. Li, Research on competency assessment of high-level managers in enterprise. *Psychologist*. 3 (2002) 193-199.
- [6] K.Shi, Human resource development based on competency model. *Advancement in Psychological Science*. 4 (2006) 586-595.
- [7] X.J. Huang, *Win in competency: a new type of competency-based human resource management system*. Beijing: Beijing Posts and Telecommunications University Press, 2007.
- [8] X.J. Huang and X.J. Huang, New ideas to enhance human resources-study on competency-based training system design. *Science and management research*. 12 (2007) 93-96.
- [9] Y.J. Zhong, Construction of training system of enterprises based on competency of senior executives in enterprise. *Journal of Jiaxing University*. 6 (2006) 92-95.
- [10] P. Shang, Competency-based staff training and development. *Human resource development*. 1 (2006) 55-56.