Theory and Exploration of the Cooperative Education of Application-oriented Universities and Enterprises from the Perspective of Production-education Integration

Ming SUN
Zhuhai College of Jilin University

Keywords: Competence, quality, Integration of production and education, Cooperative education of schools and enterprises.

Abstract. On May 23rd, 2014, during his investigation trip in Shanghai, Chairman Xi pointed out: talent is the first resource of innovation. Application-oriented universities should base themselves on serving local economic construction and social development and propel structural reform from the supply side, so as to satisfy the demands of industry development. The theory of competence and competence model has introduced the elements as well as the characteristics of different element combinations, which encourages researchers to pay more attention to the value of implicit traits that can impose greater influence on work performance. In this way, the idea used by the management and education fields for talent cultivation and evaluation criterion gets improved. Based on the theory of “competence model” and linked with the reality of integrating production and education to cultivate application-oriented talents, the present paper comprehensively uses domestic and foreign methods as well as experiences of constructing competence model for reference. In this way, the idea of constructing the competence model of application-oriented talents in production-education integration is proposed. In addition, the paper also explores the cooperative education between application-oriented universities and enterprises from the perspective of production-education integration.

Project: The Innovation Ability Cultivation Engineering Project of Zhuhai College of Jilin University in 2016—“Collaborative Development of Application-oriented Universities and Local Economy under the Strategy of Innovation-driven Development (2016XJCQZD15)”.

On May 23rd, 2014, during his investigation trip in Shanghai, Chairman Xi pointed out that “talent is the first resource of innovation”[1]. The major objective of talent cultivation of application-oriented universities is to base themselves on serving local economic construction and social development and propel structural reform from the supply side, so as to satisfy the demands of industry development. However, according to a survey: the separation rate of 2016 graduates within half a year after graduation was 34%[2], which reflected that talent cultivation and industry demand failed to fit each other in terms of structure, quality and level. [3]

Since 1950s when Doctor McClelland, a professor at Harvard University, helped the State Department of the U.S.A. design a personnel selection method which could effectively predict the practical work achievements of diplomatic officers and since 1973 when he formally put forward the concept of Competency (competence, quality, capacity) in his masterpiece Testing Competence Rather than Intelligence[4], talent selection and cultivation on the basis of competence has become a significant approach of modern human resource management. Besides, the research on competence model has also become one of the leading issues of the theoretical study of organizational behavior as well as human resource management. In the field of pedagogy, competency is usually translated as “quality” and scholars generally adopt McClelland’s definition of quality. In addition, “competence models” such as “Iceberg Model”, “Onion Model” and so on are used in the theoretical research of application-oriented talent cultivation. To avoid confusion, Competency in the present paper is collectively referred to as “competence”. Dependent on the theory of “competence model”, the paper discusses the theory as well as practice of the cooperative education between application-oriented universities and enterprises from the perspective of production-education integration.
Competency

McClelland, who was the first to apply the concept of competency in the research on human resource management, defines competency as: any individual characteristic which can measure reliably and also distinguish high-performance employees from common-performance ones, including trait, motive, self-concept, social role, attitude, value, knowledge, skills and so on. His study has proved that it is unreliable to predict work performance depending on intelligence level. He pointed out: “school achievements cannot predict career success. And intelligence as well as aptitude tests cannot predict career success or the other important achievements in one’s life.”

From the perspective of job requirements, McClelland (1973) thought that competence was a measurable behavioral characteristic. He pointed out: only when the content of competence test were extracted from the criterion behaviors which have cause and effect relation with excellent performance would the test be effective. And Spencer (1993), from the perspective of psychology, tended to consider competence as the potential characteristic of an individual which has cause and effect relation with valid or excellent performance acting as criterion in certain working conditions or situations. Through studying the competence of corporate leading team, Spencer has summarized the features of competence. Firstly, by identifying and studying competence, one can predict whether the actions of corporate leading team can direct the entire company to meet the development objectives as expected. Secondly, via the measurability of competence, one can evaluate the gap between corporate leaders and excellent leaders in terms of competence as well as the direction and extent for future improvements. Thirdly, after determining competence, leaders can meet the requirements of competence by learning and training, etc. Fourthly, a corporation can acquire competitive edge through the competence set by its strategy as well as corporate culture. Fifthly, competence will vary with the changes in environment, corporate life cycle, and corporate leaders.

Both McClelland and Spencer as well as the domestic and foreign researcher concerned reach three consensuses regarding the characteristics of competence. Firstly, it is closely related to work performance. Secondly, it is closely related to work situations. Thirdly, it can differentiate excellent performers and common ones. The connotation of competence should be a combination comprising multiple elements, including knowledge, skills, value, motive, mode of thinking, etc. Moreover, it will vary with economic and social development and change in degree according to different work situations.

Competence Model

Researches show that there is an extremely significant intrinsic driving relationship between competence and work performance. Therefore, it is of vital importance to study the components as well as operating mechanism of competence for enhancing both corporate performance and the quality of talent cultivation in universities. Competence model is a practical tool produced on the basis of competence theory for human resource development and management. Different social organizations or careers can construct different competence models in accordance with their common features. Mansfield & Mitchell (1996) thought “Competence model can describe all the aspects concerned in completing a job, such as technological requirements, treatment of unexpected situations, treatment of different working behavior relations, the ability of handling various relations in work environment and so on, in a more concise manner.”

Onion Model and Iceberg Model

Through his deep and wide research on McClelland’s quality theory, the American scholar, Richard E. Boyatzis (1982) puts forward “Onion Model of Competence.” He assimilates competence to an onion and arranges its core elements from inside to outside, following the order of motive, trait, self-image, value, social role, attitude, knowledge and skills. Richard thinks that knowledge and skills, which are placed in the outside, are easy to be observed and measured. As for the other core elements, the closer they are to the inside, the harder it is to observe and measure them.
Iceberg Model, proposed by Spencer Jr L M & Spencer S M (1993), is a model used to explain competence. They consider competence as the combination of an individual’s explicit traits and implicit traits, just like an iceberg, part of which floats on the surface while the majority of which is under the surface. Explicit traits refer to the traits which can be observed during work, including knowledge, skills and so on. They can be strengthened via school or career training. And implicit traits, including attitude, motive, value and so on, stand for the deepest part which seldom changes in an individual’s personality. They cannot be predicted without concrete behavior performance and are difficult to get altered through education or training. Nevertheless, implicit traits are often the key element in differentiating excellent performs from common ones.

The Onion Model and Iceberg Model of Competence vividly describe the components of competence as well as the traits of different element combinations, which propels researchers to pay more attention to the value of the implicit traits that impose greater influence on work performance. In this way, the idea of management and education fields for talent cultivation and evaluation criterion is improved. It will be of vital importance to scientifically construct competence model for enhancing the quality of talent cultivation in application-oriented universities and for raising the performance of corporate human resource management.

Method of Constructing Competence Model

McClelland & Boyatzis (1980) constructs competence model on the foundation of incident interview, which has been widely acknowledged and employed both at home and abroad. The main procedure includes: (1). Determine the effective standards of performance evaluation, like sales volume, interests, superior and subordinate evaluation, peer evaluation and so on. In addition, the high-performance employees and common-performance employees at the studied post are chosen as the first sample group; (2). Define and measure the competence which can differentiate the performance of the two types of employees through methods such as field observation, behavioral incident interview, subject analysis, etc.; (3). Establish competence model via assumption, subject analysis and concept formation; (4). Choose another two sample groups to verify the competence model and improve it; (5). Apply the competence model.

Boyatzis (1980) thought that the excellent work performance generated by competence, work requirements and organizational environment would influence one another. And the competence characteristics of the employees at the same or similar posts in different organizations would seldom be the same. Based on this thought, Thompson (1996) placed the emphasis of competence model construction on the future tendencies which would affect organization, work content, posts or profession. To begin with, the key changes or tendencies which affect organization, work content, posts or profession are separated; afterwards, determine the organizational competence which can fit the future in accordance with the change or tendency, combining the organization’s practical situation; at last, determine the elements and scope of competence according the organizational competence.

Zhou Xia, Jing Baofeng and Ou Lingfeng (2012) have designed Competence Scale of Innovative Talents by means of open-ended questionnaire survey, critical incident interview and so on from the perspective of talents’ supplies and demands. They have conducted an empirical research on the competence model of innovative talents and finally constructed the competence structure model of innovative talents, which consists of 27 competence items and comprise 5 competence dimensions, namely, innovative knowledge, innovative morals, innovative ability, innovative spirit and innovative personality.

Problems of Competence Model

It is of great theoretical significance and practical value to scientifically building competence model for cultivating, evaluating and selecting innovative talents by organizations like universities, enterprises and so on. However, competence theory and competence model fail to play a role as
expected in the aspect of application-oriented talent cultivation in production-education integration due to some certain reasons.

(1) In terms of discipline, researches on competence and construction of competence model by domestic and foreign scholars belong to management and pedagogy respectively, with few researches based on interdisciplinary integration. Besides, domestic scholars even translate Competency in different ways. Hence, the organic link among “education chain”, “talent chain” and “industry chain”, “innovation chain” is never achieved theoretically or practically.

(2) In terms of theory, conflicts concerned with adaptation and development as well as those concerned with depth and width exist in the construction of competence model from beginning to the end. Although the cultivation of application-oriented talents is directed by demands, market demands, which take enterprises as the main body, always require career competence to satisfy the elements of the competence needed in the current practical work. And enterprises hope that the talents introduced can rapidly give full play to their career skills and create benefits, which fail to be completely identical with the competence elements which attract more attention from the modern universities with more focus on talents’ development potentials. Talents cultivated by higher education should not only be competent for the current career demands, but also be suitable for the demands of future career advance. It is hard to unify the cultivating standards from talent supplies side and the standards from the market demands side. Nevertheless, from the overall tendency of competence development, the current career skill demands and the career development demands should both be satisfied. In particular, for the enterprises with strategic insight, talents’ “potentials” seem to be more significant.

(3) In terms of the practice of integrating production and education, there are also some operational problems. Building a competence model, it is necessary for universities and enterprises jointly determine the elements and weight of competence from the perspective of cooperative education. However, application-oriented universities are confronted with many specific choices: shall they choose industry alliance and expert organizations or industry leading corporation? Shall they establish talents’ competence standards and model based on disciplines and majors or on career demands? Even if after building competence model, they may face many troubles while applying it throughout the entire process of application-oriented talents cultivation. Because the cultivation of “implicit traits” like attitude, motive, value and so on has always been the difficult point of education, awaiting careful considering as well as urgent solution.

I. Thinking and Outlook of Building the Competence Model of Application-oriented Talents from the Perspective of Production-education integration

In 2017, General Office of the State Council published Several Opinions about Deepening the Integration of Production and Education (National 〔2017〕No. 95), which specifically proposed to “deepen the reform of ‘introducing enterprises into education’... promote the integration of corporate demands into talents cultivation[14]”. It has offered a clear development direction for solving problems including the structural imbalance between talent supply side and demand side and also provided policy support. Application-oriented universities should comprehensively use domestic and foreign advanced theories as well as approaches for reference and combine the practical demands of industry as well as corporation, based on which the competence model and cultivating system of application-oriented talents can be built in a scientific manner.

The Significance of Constructing Competence Model with the Joint Effort by Universities and Enterprises

(1) “Competence model of professional talents” will help build a shared discourse system between universities and enterprises, which can avoid asymmetric information. In this way, both parties will fit each other more greatly in terms of the standards as well as quality of talent cultivation, which will contribute to not only improving the adaptation of talent cultivation of universities, but also enhancing the scientific character of corporate talent structure.
“Competence model of professional talents” can place the “explicit traits” like knowledge, skills and so on and the “implicit traits” like attitude, motive, value, etc. on an identifiable and measurable operational level which can be evaluated. On the one side, according to the features and weight of knowledge and skills presented in the competence model, application-oriented universities can eliminate the obsolete knowledge in their teaching contents and add the new one which can satisfy market demands and future development. On the other hand, they can cultivate students’ “implicit traits” including their attitude, motive, values and so on in a more targeted manner.

(3) “Competence model of professional talents” is significant to optimizing the system of teaching evaluation and quality monitoring. By monitoring the changes in students’ competence elements, the teaching administration department and teachers can immediately figure out the effect as well as deficiency in teaching or education, so that they can adopt targeted intervening measures, which can ensure that teaching or education is always on the correct developmental track.

(4) Since teachers are the dominant power as well as executor of teaching and education, “double-profession and double-capacity” teachers are the key to implementing the cooperative education of universities and enterprises. Through constructing “Competence model of professional talents”, both parties can get clearer talents cultivation objectives. On the one hand, they can urge university teachers to keep improving their knowledge system and reinforcing their weaknesses in professional skills. On the other hand, regarding the part-time teachers who are from enterprises and participate in teaching as well as guiding internship or practice, they can increase their targeted character as well as effect in terms of urging students to increase their vocational quality, especially the “implicit traits” including attitude, motive, value and so on.

Methods of Building Competence Model

While building and implementing competence model, it is necessary to listen to corporate opinions and also consult industry associations as well as experts from professional teaching committee; it is necessary to satisfy corporate demands for current career and also follow the trend of disciplinary professional development. In a work, it should be adaptable and forward-looking; it is necessary to meet corporate demands for expertise and also cultivate talents’ transferable knowledge and skills.

(1) Connecting majors to industry demands and selecting the leading enterprises in the industry concerned or the potential representative enterprises as their cooperation partners, application-oriented universities collect information via means of questionnaire survey and critical incident interview in cooperative enterprises and also consult human resource or industry experts, working out Competence Scale of Professional Talents.

(2) According to Competence Scale of Professional Talents, proper survey samples (the 1st group) are selected from cooperative enterprises. Besides, through joint study and analysis of sample data with enterprises’ human resource department, competence elements and index weight are determined. “Competence model of professional talents” is developed based on the integration of corporate talent demand standards and university talent cultivation standards.

(3) Choose the second group pf samples from the cooperative enterprises which are similar the the first group in terms of their situations to verify the competence model and consult human resource experts as well as industry experts. Revise and complete “Competence model of professional talents”. What deserves attention is that the construction of “Competence model of professional talents” should follow the international standard system with economic globalization as well as the increasing demands of transnational enterprises for professional talents. For example, the “competence model” for engineering major should observe the relevant index system as well as demands of “professional certification of engineering education”, so as to cultivate more application-oriented talents with global vision.

(4) Talent cultivation scheme is an implementation blueprint for training professional talents and is significant to integrating production and education. Application-oriented universities should base themselves on National Standards for Teaching Quality of Undergraduate Majors in General
Institutes of Higher Education and combine “Competence model of professional talents”, and then revise talent training schemes with their cooperative enterprises, further defining talent cultivation objective and graduation demands. Afterwards, via cooperation, they can implement activities like teaching materials development, teaching design, curriculum provision, internship and practical training, etc., so as to further complete the talent cultivating system.

Building competence model of talents under the leadership of production-education integration is only the entry point and start for application-oriented universities to implement the cooperative education between universities and enterprises. It is extremely hard and systematical to figure out the operating mechanism of the interior of talent competence model as well as the relationship among all the competence elements and to apply the idea of production-education integration as well as cooperative education between enterprises and universities throughout the entire process of cultivating application-oriented talents. With the solid progress of innovative teaching reform, application-oriented universities should cultivate innovative and application-oriented talents who can be competent for the current as well as future career demands from the aspects of top-level design, construction of double-professional teacher team, teaching and education administration, teaching monitoring and evaluation, employment guiding, employment quality tracking and feedback of graduates, etc.

Acknowledgement
A Brief Introduction of the Author: Ming Sun: male, born in February of 1985. A research assistant and doctor, Works in Zhuhai College of Jilin University and is the office director of “Strengthening School with Innovation” project. Zhuhai City, Guangdong Province (519041).

Reference
[1] Literature Research Off ice of the Central Committee of the Communist Party of China. Excerpts from Chairman Xi Jinping’s Discussion on Scientific and Technological Innovation. Beijing: Central Literature Publishing House, 2016: 9.

[2] Data [J]. Graduate Employment in China, 2017 (22): 33.

[3] General Office of the State Council. Several Opinions of the General Office of the State Council about Deepening the Integration of Production and Education [EB/OL]. (2017-12-19) [2018-08-28]. http://www.gov.cn/zhengce/content/2017-12/19/content_5248564.htm

[4] David C. McClelland. Testing for Competence rather than for Intelligence. American Psychologist, 1973, (28):1-14.

[5] Chen Wansi et al: Recruitment Management of Human Resource Manager in Family Business—Based on the Perspective of the Competence of Human Resource Manager, Human Resource Development of China. 2009, 05.

[6] Zhong Lifeng, Shi Kan. The New Development of the Research on Competence [J]. Nankai Business Review, 2003 (02): 4-8.

[7] Mansfiled, B. Mitchell, L. Towards a Comptentent Workforce [M].Hampshire Aldershot: Gower Pub Co, 1996.

[8] Richard E. Boyatzis. The competent manager: a model for effective performance [M]. New York John Wiley & sons, 1982.

[9] Spencer Jr L M, Spencer S M. Competence at work: Models for superior performance [M]. New York: John Wiley & Sons, Inc, 1993: 297~301.
[10] McClelland D C, Boyatzis R E. Opportunities for counselors from the competency assessment movement [J]. The Personnel and Guidance Journal, 1980, (1):368-372.

[11] Feng Ming, Yin Mingxin. A Summary of Construction Methods of Competence Model [J], Science and Technology Management Research, 2007 (09): 229-230+233.

[12] Thompson J E, Stuart R, Lindsay P R. The competence of top team members [J]. Journal of Managerial Psychology, 1996, 11(3):48-66.

[13] Zhou Xia, Jing Baofeng, Ou Lingfeng. Empirical Study on Competence Model of Innovative Talents [J]. Chinese Journal of Management, 2012, 9 (07): 1065-1070.

[14] General Office of the State Council. Several Opinions of the General Office of the State Council about Deepening the Integration of Production and Education [EB/OL]. (2017-12-19) [2018-08-28]. http://www.gov.cn/zhengce/content/2017-12/19/content_5248564.htm

[15] Li Mingfei, Lu Xiaojun. Research on Competence and Competence Modeling [J]. Journal of Dalian University of Technology (Social Sciences), 2004 (01): 28-32.

[16] Feng Ming, Yin Mingxin. A Summary of Construction Methods of Competence Model [J], Science and Technology Management Research, 2007 (09): 229-230+233.