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Research on the Comprehensive Cognitive Practice Teaching Mode of Engineering Management Majors -Take Jiangxi Normal University as an Example

LIU Zhangsheng[a],*; FAN Yuqi[a]; ZHOU Lan[a]; FAN Zhenggen[a]; ZENG Wenhai[a]

[a]College of City Construction, Jiangxi Normal University, Nanchang, Jiangxi, China.
*Corresponding author.

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Abstract

To improve the quality of talent training, this paper discusses the feasible teaching mode of comprehensive cognitive practice for Engineering Management through summarizing more than ten years of exploration and practice of Jiangxi Normal University. Focusing on the problem of "three focuses and three limits" in the practical teaching of Engineering Management majors, this paper analyzes the four key problems existing in China's Engineering Management majors, based on the conclusion of the existing comprehensive cognitive practice teaching mode. The paper also puts forward a special comprehensive cognitive practice mode and its implementation path on the account of practical explorations. This mode achieves the "three sharing", realizes the "linkage of multiple effects", and obtains the satisfactory teaching effect and social benefit, which can provide a reference for the construction of related discipline in other colleges and universities.

Key words: Teaching mode; Engineering management majors; Cognitive practice

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1. RAISE OF PROBLEM

Engineering Management is an interdisciplinary of Engineering Technology and Economic Management, as well as an application-oriented subject, which has a high requirement for cultivating students' practical ability. However, previous studies have shown that graduates of Engineering Management majors are lack of perceptual understanding of the actual process of engineering projects, basic and overall understanding of the management problems to be solved during the engineering projects, and recognition of their practical and innovation ability from employers (Dai, 2011, pp.162-164, p.168; Fu & Zhang, 2017, pp.192-195). Although there is huge shortage of qualified personnel of Engineering Management in China, the employment matching degree and employment quality need to be improved urgently. The reason behind this is that education mode and education method of higher education do not match the rapid development of society, especially the deficiency of practical teaching mode.

The deficiency of traditional cognitive practice is mainly reflected in teaching objectives, methods, evaluation, etc. The problem can be concluded as "three focuses and three limits". More Specifically, "three focuses and three limits" refers to: too much focus on solving teaching tasks, limited construction of sharing platform through internship; too much focus on improving professional skills, limited promotion from ideological and political thinking into practice through internship; too much focus on improving internship effect, limited achievement of a variety of linkage effects through internship.

1.1 Too Much Focus on Solving Teaching Tasks, Limited Construction of Sharing Platform Through Internship

Traditional practical teaching is often based on the obsolete and solidified practical teaching syllabus, which mainly focuses on the completion of practical teaching tasks by teachers. Consequently, it is often difficult to consider things other than students' professional practical teaching, and the teaching effect often depends on individual teachers. This type of teaching mode based on the teaching framework formed by textbook content, and teachers could adjust and supplement course content based on their own ability. Most students complete their studies under teachers' guidance and assistance. The breadth and depth of the teachers' knowledge determines the learning effect. Practical teaching is constrained by fixed classroom time and space, which is lack of a resource sharing platform connecting the campus and outside.

1.2 Too Much Focus Improving Professional Skills, Limited Promotion From Ideological and Political Thinking Into Practice Through Internship

In the past, practical teaching centered on imparting professional knowledge and improving students' professional skills, and focused on training professional ability, such as the situational learning of real estate market analysis, marketing, evaluation and other professional knowledge. However, limited concentration is put on the ideological and political elements that imply in the practical process, for example, consciousness of mutual respect between teachers and students, consciousness of teamwork among students, spirit of mentoring between alumni and students, and spirit of regurgitation feeding from alumni, etc. As a result, the practical teaching is not able to cultivate students in multi-dimension, and the educational element is monotonous, which is not conducive to the all-round training of students.

1.3 Too Much Focus Improving Internship Effect, Limited Achievement of a Variety of Linkage Effects Through Internship

Traditional practical teaching can achieve the established effect of strengthening professional learning and deepening professional foundation, but the effect dimension of practical teaching is small, the result is single, and other effects other than cognitive practical teaching are not explored, such as strengthening the connection with enterprises, developing off-campus practice bases, establishing alumni organizations and other linkage effects.

2. LITERATURE REVIEW AND KEY PROBLEMS OF COMPREHENSIVE COGNITIVE PRACTICE

From international perspective, there are three typical practical teaching modes: The German "enterprise type" of practical teaching mode; The American "entrepreneurial type" of practical teaching mode; The British "scientific research type" of practical teaching mode. Universities of Applied Sciences in Germany generally implement the education mode of "dual system". The "dual system" is a school-running system supported by national legislation and jointly constructed by schools and enterprises, aiming at strengthening practical teaching and cultivating students' professional skills (Li, Chen, & Zhu, 2011, pp.172-174). The American "entrepreneurial type" of practical teaching mode has more than sixty years of history, and college students' entrepreneurship has become one of the direct driving forces of the U.S. economy. By 1999, MIT graduates had founded more than 4,000 companies. At least half of Silicon Valley's revenues from 1986 to 1996 were generated by companies founded by faculties and students from Stanford University (Fang & Liu, 2006, pp.41-44). Entrepreneurship courses in American universities are divided into "four categories and three modules". "Four categories" refer to entrepreneurial consciousness, entrepreneurial basic knowledge, entrepreneurial skills and qualities, and entrepreneurial practical operation. "Three modules" are entrepreneurial theory elaboration, typical case analysis and simulation exercise (Zhang, 2014, pp.118-120). The first and most advanced universities to launch entrepreneurship education are Babson College, Harvard University and Stanford university. Babson College mainly cultivates entrepreneurial consciousness; Harvard University concentrates on practical management experience; and Stanford University focuses on systematic entrepreneurial knowledge (Zhang, 2000, pp.11-16). The British Royal Society for the Advancement of Literature, Manufacturing and Business (RSA) issued "Education for Capability Manifesto" in 1979, which encourages students to develop and exercise their practical working ability through self-discovering problems, self-solving problems and participating in practical activities which serve the society independently. By the mid-1990s, most universities had undergone competency-based education reform. The reform introduced "competency-based education" into practical teaching system, taking educatees' individual development as the starting point, full play of subjectivity as the main method, and cultivation of innovative ability as the main purpose, which gradually formed a "scientific research type" of practical teaching mode (Jin & Jia, 2016, pp.152-153).

Due to the different history and tradition of universities in different countries, the understanding and development patterns of practical teaching are also diverse. The existing off-campus practical teaching modes in foreign countries mainly focus on entrepreneurship type, scientific research type, enterprise type and other aspects. However, the problem of "three focuses and three limited" existing in Engineering Management majors in China is rarely explored. This phenomenon is mainly caused by the following reasons:

2.1 Problems of Formulating Practical Guideline in a Scientific Way

The teaching system of higher education in China inherited the model of the former Soviet Union, which has a relatively rigorous syllabus. Comprehensive cognitive practice involves class coordination, student organization, team coordination and other issues, which needs to be planned and arranged in advance. Therefore, a scientific and rigorous practical guideline is the precondition for the effective implementation of comprehensive cognitive practice.

2.2 Problems of Organizing Alumni Association and Cognition in a Proper Way

In the cultivation system of higher education in China, the teacher acts as a nanny to students. As far as the cognitive practice is concerned, there are multiple realistic problems. Firstly, comprehensive cognitive practice needs to solve a series of problems, such as collective transportation, accommodation, food and discussion with alumni associations. Travels between cities can take trains, while local transportation requires chartered cars for the whole journey. Accommodation, catering and conference should be considered so large multi-functional hotels or combing form of "accommodation + conference room + dining" (i.e. large conference room and restaurant can be rented near the hotel) are required. However, hotels that can provide large-scale accommodation, catering and conference venues at the same time usually have high standards of accommodation, which means the cost is rather high. Meanwhile, the combing form of "accommodation + conference room + dining" is difficult to choose.

Secondly, comprehensive cognitive practice needs to use the summer vacation time to carry out comprehensive cognitive practice activities to avoid affecting normal course study. During the summer vacation, the temperature is high, which means students are susceptible to heat stroke after excessive outdoor exercise and they may have difficulty in continuing practice. Therefore, more scientific organization form is needed to ensure the high-quality completion of comprehensive cognitive practice.

2.3 Problems of Implementing Ideological and Political Thinking Into the Majors in an Effective Way

The course ideological and political teaching reform is not simply "labeling", but to follow the principle of "salt dissolved in soup", the principle of subjectivity and the principle of practicality, and respect the law of curriculum construction, the law of practical teaching and the law of student learning. Establishing a scientific organizational structure of standardized, normalized and systematic curriculum design of ideological and political teaching, and strengthening value guidance, knowledge transmission and ability training, are the keys to the realization of practical ideological and political teaching objectives.

2.4 Problems of Arranging All Kinds of Strategic Cooperation Units in a Rational Way

On the one hand, the number and team size of teachers and students participating in practice activities each year are large, which requires large-scale enterprises and projects to be arranged at the same time. Since large-scale practice team may have some influence on the normal operation to enterprises and projects, few enterprises are willing to arrange such large-scale practice activities, and large projects with teaching significance are even more difficult to contact. On the other hand, cognitive practice needs a long period of time, and the costs involved mainly include round-trip train fare, urban cart fee, hotel accommodation fee, expert lecture fee, conference fee, meals charge, etc. Without effective organization and arrangement, cognitive practice is likely to become city tour, which may result in poor practical effect, low price-quality ratio, unworthy cost and other problems. Therefore, reasonable distribution of strategic partners is extremely important.

3. THE EXPLORATION OF CONSTRUCTING COMPREHENSIVE COGNITIVE PRACTICE MODE

In the past decade, focusing on improving students' comprehensive practical ability, the College of Urban Construction of Jiangxi Normal University has been exploring the comprehensive cognitive practice mode of summer vacation since 2005, and has accumulated rich practical experience. Overall, this exploration has gone through three stages.

3.1 Exploratory Stage

Since 2005, the College of Urban Construction of Jiangxi Normal University has organized third year students to go to Shenzhen to conduct comprehensive cognitive practice activities in enterprises and projects and has invited local alumni to hold seminars and exchanges. In 2005, it was the first time for this major to organize students to go to

Shenzhen for cognitive practice activities. Due to the large number of students, the comprehensive cognitive practice teaching activities encountered great resistance. On the one hand, it is necessary to design the cognitive practice routine, confirm the practical content and formulate the cognitive practice scheme. On the other hand, cognitive practice programs need to be implemented, including contacting enterprises and companies that are willing to receive large-scale of students' cognitive practice, arranging visiting projects, organizing alumni seminars, etc., as well as issues such as accommodation, transportation, venue, dining, safety management and economic costs during the internship.

In 2005, through a strong organization, the College of Urban Construction of Jiangxi Normal University made full use of good alumni resources and on the basis of personal relationships, arranging students to visit the Shenzhen Centaline Group, Shenzhen Worldunion Property Consulting Co., Ltd, Shenzhen Yinglian Real Estate Consulting Co., Ltd, Shenzhen Tongzhixing Property Consulting Co., Ltd, Shenzhen Geheng Real Estate Consulting Co., Ltd, Shenzhen Vanke and other enterprises and projects. Cognitive practice plan was fully implemented and laid a solid foundation for the improvement and development of comprehensive cognitive practice mode.

After that, by summarizing the experience of 2005, the College of Urban Construction of Jiangxi Normal University organized students from Engineering Management majors of 2002-2004 to go to Guangzhou, Shanghai and other cities for comprehensive cognitive practice in 2006 and 2007, respectively. Since there was no comprehensive cognitive teaching in the teaching plan at this stage, additional practical teaching was added to the plan. Three consecutive years of practical exploration laid a solid foundation for optimizing the training program. In 2008, the comprehensive cognitive practice teaching plan was formally incorporated into the training program. In that year, the comprehensive cognitive practice of Engineering Management majors also had a formal practical guidance outline, and the school officially supported relevant teaching funds.

3.2 Development and Perfect Stage

Since 2008, students of 2005 went to Hangzhou for comprehensive cognitive practice, which was the first time to carry out practice training in accordance with the Guidance Outline for Comprehensive Cognitive Practice of Engineering Management Majors (Framework Outline). The outline set out principle requirements for comprehensive cognitive practice purpose, practice location, practice methods, practice time, practice content, formation arrangement, organization and management methods, responsibilities and division of labor, submitting document, annual practice guidance outline and other details. On this basis, by constantly summing up experience, the practice outline was gradually improved, which further standardized the comprehensive cognitive practice activities of Engineering Management majors and absorbed and continued the previous cognitive practice experience.

At the same time, through years of accumulation, a practical cooperative enterprise network is built, such as the establishment of alumni website, management system, alumni WeChat group, practice base and off-campus supervisors of College of Urban Construction of Jiangxi Normal university, and the development of Million Alumni Fund.

3.3 Application and Promotion of the Results Stage

In April 2015, with the support of the Network Management Center of the university, the alumni management system was officially launched and opened, which was integrated with the official website and alumni website of the College of Urban Construction, achieving "three in one".

From May 2015 to now, in order to effectively solve the "Four Difficult Problems", the information platform with intelligent linkage function is further developed and constructed, which builds a new mode of talent training with the features of "full participation, solid communication, lifelong learning, scientific leading". Remarkable achievements have been made in resources integration, school running conditions and talent training quality. This mode has been widely used in Engineering Management majors such as real estate development and management, land resource management, etc., and has attracted the attention of other majors inside and outside the university.

4. THE MAIN CONTENT AND IMPLEMENTATION PATH OF THE COMPREHENSIVE COGNITIVE PRACTICE MODE

Aiming at the difficult problems of comprehensive cognitive practice, through many years of practice and exploration, the College of Urban Construction of Jiangxi Normal University sums up a special solution idea.

4.1 Develop a Training Program Scientifically

Since 2005, College of Urban Construction of Jiangxi Normal University has organized students majoring in Engineering Management to carry out comprehensive cognitive practice in cities outside the province. After repeated studies, the content of comprehensive cognitive practice was determined to be understanding cities, inspecting enterprises, visiting projects, participating in expert lectures and alumni seminars, etc. The duration of cognitive practice is the summer vacation of third year

study, which lasts for one week and is set as required credits.

4.2 Promote the Construction of Five Alumni Funds

The development of Million Alumni Fund and Enterprise Fund includes: Real Estate Alumni Fund of Jiangxi Normal university, Zhongchengda Sports Fund for College of Urban Construction in Jiangxi Normal University, Bamu Innovation and Entrepreneurship Alliance Grant of Jiangxi Province, Jiangxi Real Estate Grant of College of Urban Construction, Nanchang Shangmeijia Grant of College of Urban Construction, etc.

4.3 Establish an Alumni Sharing Platform

Through close contact and the basis of establishing the alumni group of Jiangxi Normal University and developing and constructing the website of alumni association of College of Urban Construction of Jiangxi Normal University, the alumni management system was developed and constructed in 2015. The system registered graduates majoring in engineering management, real estate development and management, land resource management, urban and rural planning, architecture and other majors at all levels, thus forms an internal communication system and building a "three-dimensional communication" network platform.

4.4 Select Ten Strategic Partners

In order to ensure the smooth development of cognitive practice, ten strategic partners were selected from alumni enterprises and well-known enterprises in the industry, including: Shanghai Greenland Group Jiangxi ShenJiang Real Estate Co., Ltd., Jiang IB Co., Ltd., Jiangxi Vanke's Profit of Real Estate Investment Co., Ltd., Dongguan Centaline Property Consulting Co., Ltd., The Worldunion Real Estate Consulting (Huizhou) Co., Ltd., Shenzhen ChengDa Real Estate Consulting Co., Ltd, Jiangxi Xinli Real Estate Investment Co., Ltd., Nanchang Honggutan Wanda Plaza Investment Co., Ltd., Nanchang Zhengrong (Singapore) Real Estate Co., Ltd., and Xiamen Simon Real Estate Marketing Planning Co., Ltd, all of which have great influence in the industry.

5. THE IMPLEMENTATION EFFECT OF COMPREHENSIVE COGNITIVE PRACTICE MODE

By continuously consolidating the foundation and constantly enriching and improving the practical connotation of a special solution idea, the "three sharing" has been achieved in the practice process of more than a decade, and then the " multiple linkage effects" have been achieved, which have good teaching effect and social benefits.

5.1 Urge Three Sharing

Professional cognitive practice teaching needs to go out of the campus and get into the society. Visiting enterprises and projects involve schools and enterprises, teachers and students, alumni and employees, on-site and platform, etc., which needs to uphold to the concept of sharing, apply collaborative thinking, find common ground and common points, learn from each other's strengths and avoid weaknesses, and promote a win-win situation for all parties. Through many years of exploration, the followings are realized: using alumni platform as starting point to strengthen contacts between alumni enterprise and resources sharing between alumni inside and outside the university; using the practice of circular cognition as the starting point to promote the linkage of alumni associations between different regions, promote the teaching reform of different courses, and share the new development trends of the industry inside and outside the university; using the Alumni Foundation Committee as the starting point to realize the seamless sharing of professional status promotion and ideological and political advancement through the role of role models and benchmark.

5.2 Multiple Linkage Effect

From the perspective of practice theory, the real-life world is not an environment waiting for people to "embed". Life is the creation of subjective practice activities, which are constantly constructed and generated with people's practice. Through years of exploration and practice, comprehensive cognitive practice has realized the linkage of professional effects and other effects.

5.2.1 Professional Linkage Effects

Each year, students go to Beijing, Shanghai, Guangzhou, Shenzhen, Dongguan, Huizhou, Xiamen and other cities to carry out cognitive practice. Based on the principle of "Understanding cities, industry, enterprises, professionals and alumni", the cognitive practice broadens students' horizons, gives students opportunity to understand the city and the development of related industries, and lets students to feel the professional features and work content of the industry, which all help students further correct their learning attitude and learning direction.

5.2.2 Other Linkage Effects

Firstly, the connection between the university and the enterprise is strengthened. Each cognitive practice has the content of visiting and inspecting enterprises, which is also a process of strengthening the connection with enterprises. By changing the practice location every year and inspecting enterprises in different cities, more enterprises can be communicated with and more enterprise resources can be provided for the exchange and cooperation between colleges and enterprises.

Secondly, the development of alumni associations is promoted. Every year, students are organized to carry

out cognitive practice in Beijing, Shanghai, Guangzhou, Shenzhen, Dongguan, Huizhou, Xiamen and other cities. In each practice, discussions and gatherings with local alumni are arranged, which promotes the development of alumni organizations and lays a solid foundation for the construction of professional alumni associations.

Then, the practice base is developed to provide employment information. By strengthening contacts with enterprises and under the strong support of alumni from all over the country, school-enterprise cooperation is effectively promoted, practical bases are developed, employment information is provided, and a virtuous circle is created. Up to now, Engineering Management majors have developed more than thirty-four practice bases, which can provide numerous employment information every year.

Finally, ideological and political education is embedded in the cognitive practice. The cognitive internship process is a one-week interaction process between instructors and students on campus, a process of close contact between alumni and students on campus, as well as a process of collective travel of students on campus. Through teacher-student communication, alumni discussion and other ways, the spirit of mentoring can be cultivated between students and alumni, which focuses on the transmission of gratitude and the spirt of regurgitation-feeding. While alumni provide students with internship and employment opportunities, donate alumni funds, assist the development of practice bases and other support to their parent schools, invisible education to students in school is also happening.

CONCLUSION

The comprehensive cognitive practice of Engineering Management major plays an important role in improving the quality of practical teaching and cultivating high-quality engineering management professionals. Based on more than ten years of exploration by Engineering Management majors in the College of Urban Construction of Jiangxi Normal University, this paper summarizes a comprehensive practice mode with full details and its implementation path around the problem of "three focuses and three limits" in the cultivation of Engineering Management talents in China at the present stage. This mode promotes "three sharing", realizes "multiple linkage effects", and plays a positive role in discipline construction and talent cultivation.

REFERENCES

Dai, X. Y. (2011). Application of sand table simulation of engineering project management in practical teaching of engineering management. *Experimental Technology and Management, 28*(12), 162-164+168.

Fu, F., & Zhang, T. (2017). Research on the combination of virtuality and reality of BIM practical teaching of engineering management. *Laboratory Research and Exploration, 36*(04), 192-195.

Li, Z. H., Chen, Z. W., & Zhu, J. H. (2011). Application research of the German "Dual System" mode in engineering practice teaching. *Experimental Technology and Management,* (09), 172-174

Fang, G. Z., & Liu, H. Y. (2006). Entrepreneurship Education Model of American College Students and Enlightenment. *Foreign Education Research*, (12), 41-44.

Zhang, A. X. (2014). A Peek into the successful experience of entrepreneurship education in American universities. *Journal of Hunan Vocational and Technical College of Mass Media*, (02), 118-120.

Zhang, Y. T. (2000). "Ability Education Declaration" and "Action-based Learning" mode of British higher education. *Comparative Education Research*, (01), 11-16

Jin, T., & Jia, H. Z. (2016). Research on practical teaching system of innovative engineering talent rraining. *Education Teaching BBS*, (06), 152-153.

