Analysis of the Vocational Competence Formation Mechanism of Management Majors in Higher Technical and Vocational Colleges

Wan Guangsheng[1] Wang Lina[1] Wang Feng[1]

[1] Shanghai Medical Instrumentation College, USST, Shanghai, 200093

Abstract

Vocational competence is the foundation of work and future vocation development for students in higher technical and vocational colleges. This paper discusses the vocational competence formation mechanism of management majors in higher technical and vocational colleges. Through empirical study, it is found that professional skill, communication and teamwork cooperation are direct factors of vocational competence formation of management majors. Adaptation to environment has indirect influence on vocational competence formation by promoting communication and teamwork cooperation. Therefore, we should pay attention to the training of professional skill, communication and teamwork cooperation besides professional knowledge teaching in vocational competence training of management majors.

Keywords: vocational competence, formation mechanism, management major, higher technical and vocational college

1. Introduction

Vocational competence training is one of the key tasks for vocational education. How to cultivate students' vocational competence has become the central issue of teaching reform in higher technical and vocational colleges. Students' vocational competence formation in higher technical and vocational colleges is influenced by many factors. It is necessary to identify these factors and explore students' vocational competence formation mechanism. A clear understanding of the antecedents can provide a starting point for school education.

In the present studies on vocational education, more studies focus on science and engineering majors. Since management majors and science and engineering majors have different disciplinary characteristics, their education content is different. This paper aims to explore the vocational competence formation mechanism of management majors in higher technical and vocational colleges. We hope it can provide references for vocational competence cultivation of students in higher technical and vocational colleges.

2. The study

2.1. Research questions

Vocational competence is the foundation of work and future vocation development

for students in higher technical and vocational colleges. There are different views on the definition of vocational competence, such as task competence view, integral competence view, key competence view and integrative competence view.

German scholar Mertens (1972) proposed the concept of key competence, which means the competence to adapt to changes in vocation. It was quickly accepted by vocational educators in many countries. Huang Renwei and Xiao Yun (2013) pointed out that vocational competence is the competence for engaging in modern vocations, which is the external comprehensive demonstration of knowledge, skill, caliber and so on in vocational activities.

Yu Hongwen and Liu Yan (2013) believed that knowledge competence and skills are main vocational competence that students in higher technical and vocational colleges must have. Knowledge competence includes basic knowledge, professional knowledge and relevant knowledge associated with professional work. Skills includes key competences such as professional skill application, site organization and management, transferable competence such as cooperation, communication, adaptation and information technology application and self-management competence such as self-study, development and self promotion. Zhou Biao *et al.* (2007) constructed vocational competence evaluation index system for higher vocational students, which includes basic competence, skills, professional competence and development competence.

For the students in higher technical and vocational colleges, basic competence, professional competence and key competence are important elements for their vocational competence. According to key competence view of vocational competence, characteristics of management majors and particularity of their work, the author thinks that the formation of students' vocational competence is influenced by key competences such as professional knowledge and skill, communication, teamwork cooperation and adaptation to environment. In this paper, professional knowledge, professional skill, adaptation to environment, communication and teamwork cooperation are chosen as the influential factors of management majors' vocational competence formation in higher technical and vocational colleges.

This paper explores how these factors influence and promote the formation of vocational competence. We have the following research questions.

Question 1: Whether the above mentioned factors individually influence the formation of vocational competence?

Question 2: How do they influence on the formation of vocational competence when they are considered as a whole ?

For professional knowledge, professional skill, adaptation to environment, communication and teamwork cooperation, they may have different influence on the final formation of vocational competence. For example, only when professional knowledge is digested and transformed into professional skill, can it promote the formation of vocational competence.

Influenced by the particularity of work, communication and teamwork cooperation are also important objectives for management majors' education. Therefore, on the one hand, students' professional skill has positive influence on communication and teamwork cooperation. On the other hand, communication and teamwork cooperation directly influence on the formation of vocational competence. Adaptation to environment is largely decided by students' personal characters. It also influences on students' communication and teamwork cooperation in work to a certain extent. Then, we have the following research questions:

Question 3：Do students' professional skill and adaptation to environment influence on the communication and teamwork cooperation in their work?

Question 4: How students' professional skill, adaptation to environment, communication and teamwork cooperation work together to influence on the formation of vocational competence?

2.2. Variables measurement

Self-evaluation is adapted to measure students' vocational competence. It requires the students to review their overall vocational competence performance in work, with 2 items. The measurement of influential factors is as follows. (1) Professional knowledge. It measures students' grasp of professional theoretical knowledge in school. (2) Professional skill. It measures students' competence to use flexibly the professional theoretical knowledge learnt at school. (3) Adaptation to environment. It measures if students have a strong adaptation competence when they are in a new work environment. (4) Communication. It measures students' interpersonal communication competence in work. (5) Teamwork cooperation. It measures students' cooperation competence in teamwork. That is to say if they can cooperate well with their co-workers in work. All the above mentioned variables include three items.

The Likert 7 scale is used for measurement. The Crobanch's Alpha coefficients of the above mentioned variables are 0.93、0.91、0.76、0.92 and 0.95 respectively. The Crobanch's Alpha coefficient of self-evaluated vocational competence is 0.94. They are all bigger than 0.7. In addition, the respondents' gender, operating post, company category and salary level are listed as control variables to eliminate their influence on vocational competence evaluation.

2.3. Data collection

Data of this study were obtained through questionnaire surveys. 150 questionnaires were distributed to the management-major graduates of higher technical and vocational colleges, who work in Shanghai. 99 valid samples were used for analysis. Among them, 47% are females, 53% males. Currently, the respondents mainly engaged in the operating posts such as production, sales and management. 69% of them are employed in private enterprises, 7% in state-owned enterprises and 23% in foreign direct investment and joint venture enterprises. SPSS19.0 is used for data statistics and analysis.

3. The results

3.1. Data description statistics

Table 1 shows the mean values, standard deviations and correlation coefficients between each two of all variables in this study.

From table 1 we can see that self-evaluated competence and professional knowledge ($r=0.769$, $p<0.01$), professional skill ($r=0.785$, $p<0.01$), adaptation to environment ($r=0.691$, $p<0.01$), communication ($r=0.769$, $p<0.01$) and teamwork cooperation ($r=0.811$, $p<0.01$), they are all significantly positive relevant. Communication and professional skill($r=0.722$, $p<0.01$) and adaptation to environment ($r=0.736$, $p<0.01$) are significantly positive relevant. Teamwork cooperation and professional skill($r=0.656$, $p<0.01$) and adaptation to environment ($r=0.660$, $p<0.01$) are significantly positive relevant. These provide the initial basis for answering Question 1, Question 2, Question 3 and Question 4.

Table 1 Mean, standard deviation and correlation coefficient of all the variables

	1	2	3	4	5	6
1. professional knowledge	1					
2. professional skill	.870**	1				
3. adaptation to environment	.622**	.673**	1			
4. communication	.631**	.722**	.736**	1		
5. teamwork cooperation	.609**	.656**	.660**	.686**	1	
6. self-evaluated competence	.769**	.785**	.691**	.769**	.811**	1
Mean	4.94	5.03	5.25	5.33	5.56	5.24
Standard deviation	1.36	1.26	1.20	1.25	1.22	1.24

Note: ** stands for p<0.01 (tow-tailed).

3.2. Regression analysis

To further verify the proposed research questions, the data were further analyzed using regression, with self-evaluated competence as dependent variable, professional knowledge, professional skill, adaptation to environment, communication and teamwork cooperation as independent variables, gender, operating post, company category and salary level as control variables. The results show that when all factors are considered, professional knowledge (β=0.282, p<0.01), communication (β=0.243, p<0.01) and teamwork cooperation (β=0.415, p<0.01) have significantly positive influence on self-evaluated competence. While professional skill (β=0.110, p>0.1) and adaptation to environment (β=-0.011, p>0.1) have no significant influence on self-evaluated competence. After the regression analysis of each factor's influence on dependent variable, it is found that every factor is significant, combining correlation coefficients. These results suggest that factors influence each other when we comprehensively consider all factors' influence on vocational competence formation. And they have different influences. Therefore, it is necessary to further explore their paths or formation mechanism.

With self-evaluated competence as dependent variable, we gradually introduced independent variables and compare the model fitting of each model with hierarchical regression. When only professional knowledge (β=0.337, p<0.05), professional skill (β=0.317, p<0.05) and adaptation to environment (β=0.271, p<0.01) introduced, they all have significantly positive influence on self-evaluated competence. When only communication (β=0.396, p<0.01) and teamwork cooperation (β=0.554, p<0.01) introduced, they both have significantly positive influence on self-evaluated competence. When professional knowledge (β=0.352, p<0.01), communication (β=0.266, p<0.01) and teamwork cooperation (β=0.419, p<0.01) introduced, they all have significantly positive influence on self-evaluated competence. Based on professional knowledge, communication and teamwork cooperation, when either professional skill or adaptation to environment are introduced, neither professional skill (β=0.108, p>0.1) nor adaptation to environment (β= -0.002, p>0.1) has significant influence on self-evaluated competence. However, the three original independent variables all have significantly positive influence. In each of the above regression model analysis, control variables were all manipulated.

Generally speaking, the mechanism among theses factors may be like this. Professional knowledge is the foundation of professional skill formation. Professional skill, adaptation to environment, communication and teamwork coopera-

tion all have direct or indirect influence on self-evaluated competence. On one hand, professional skill and adaptation to environment may directly influence on competence formation. On the other hand, they may indirectly influence on competence formation through communication and teamwork cooperation. Communication and teamwork cooperation directly promote competence formation. With professional skill and adaptation to environment as independent variables, communication and teamwork cooperation as mediators, self-evaluated vocational competence as dependent variable, their mechanism was analyzed with hierarchical regression. The results are as shown in table 2.

Table 2 Hierarchical regression results of vocational competence formation (standardized)

Dependent variables	Communication		Teamwork cooperation		Self-evaluated competence					
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
CV										
CV1	-0.065	0.021	0.021	0.097	-0.084	0.020	-0.070	0.013	-0.028	-0.027
CV2	0.043	-0.020	-0.036	-0.093	-0.009	-0.072	-0.007	-0.065	-0.026	-0.027
CV3	-0.032	-0.008	0.014	0.035	-0.013	0.009	-0.008	0.012	-0.008	-0.004
	-0.079	-0.005	-0.256*	-0.191*	-0.128	-0.028	0.043	-0.027	0.067	0.058
IV										
IV1		0.420**		0.365**		0.594**		0.442**	0.412**	0.338**
IV2		0.460**		0.417**		0.293**		0.127	0.084	0.004
Mediator										
MV1							0.396**	0.361**		0.225*
MV2							0.554**		0.500**	0.444**
R^2	0.017	0.640	0.063	0.555	0.028	0.664	0.764	0.711	0.775	0.792
F-value	0.345	22.775**	1.317	15.980**	0.562	25.401**	37.635**	26.758**	37.504**	35.769**

Note: * stands for p<0.05, ** stands for p<0.01. CV stands for control variables, CV1 stands for gender, CV2 stands for operating post, CV3 stands for company category, CV4 stands for salary level, IV stands for independent variables, IV1 stands for professional skill, IV2 stands for adaptation to environment, MV1 stands for communication, MV2 stands for Teamwork cooperation. M*i* stands for model *i*, *i*=1, 2, ⋯, 10.

Model 1 and model 2 show that independent variables professional skill (β=0.420, p<0.01), adaptation to environment (β=0.460, p<0.01) have significantly positive influence on mediating variable communication. Model 3 and model 4 show that independent variables professional skill (β=0.365, p<0.01), adaptation to environment (β=0.417, p<0.01) have significantly positive influence on mediating variable teamwork cooperation. Model 6 shows that independent variables professional skill (β=0.594, p<0.01), adaptation to environment (β=0.293, p<0.01) have significantly positive influence on dependent variable self-evaluated vocational competence. Model 7 shows that mediating variables communication (β=0.396, p<0.01), teamwork cooperation (β=0.554, p<0.01) have significantly positive influence on dependent variable self-evaluated vocational competence. Model 8, Model 9, Model 10 and analyses of the above competing models comprehensively show that the influence of independent variable adaptation to environment (β=0.127, p>0.1; β=0.084, p>0.1; β=0.004, p>0.1) on dependent variable self-evaluated competence is completely transferred by mediating variables communication and teamwork cooperation. Independent variable professional skill indirectly influences on dependent variable through mediating variables communication and teamwork cooperation on the one hand. Professional skill (β=0.442, p<0.01; β=0.412, p<0.01; β=0.338, p<0.01) directly influ-

ence on dependent variable self-evaluated competence on the other hand.

4. Conclusion

This paper studies the vocational competence formation mechanism of management majors in higher technical and vocational colleges. Specifically, it analyzes how professional knowledge, professional skill, adaptation to environment, communication and teamwork cooperation influence each other and finally promote the formation of vocational competence.

The results show that each of the above factors has positive influence on vocational competence formation. We explored how these factors influence on the formation of vocational competence when all of these factors comprehensively considered. It is found that professional knowledge promotes professional skill. Professional skill directly influences on the formation of vocational competence on one hand. It indirectly promotes the formation of vocational competence through influencing on communication and teamwork cooperation on the other hand. Adaptation to environment does not directly influence on vocational competence by itself. It indirectly influence on the formation of vocational competence through communication and teamwork cooperation. Communication and teamwork cooperation are influenced by professional skill and adaptation to environment on one hand. They have direct influence on formation of vocational competence on the other hand.

Therefore, we can see that professional skill, communication and teamwork cooperation are the most direct factors for the formation of vocational competence in students' work. Adaptation to environment has indirectly influence on the formation of vocational competence. Therefore, in vocational competence training of management majors in higher technical and vocational colleges, besides the professional knowledge education, we should promote the formation of vocational competence through promoting professional skill, communication and teamwork cooperation.

This study mainly focuses on vocational competence formation of management majors. It did not explore vocational competence formation of other majors. Therefore, the application of the research findings may be limited. Research of other majors can be carried out in the future.

5. References

[1] Tang Xiangling. Summary of study on raising students' vocational ability of higher vocational colleges [J]. *Journal of Zhangjiakou Vocational College of Technology*, 2006(3),p6-8.

[2] Yu Hongwen & Liu Yan. Discussion on vocational competence cultivation and its new models construction of students in higher vocational colleges [J].*China Adult education*, 2013 (10), p77-79.

[3] Zhou Biao, Liu Luping, Ye Shanghe, Wu Yilin. On evaluation model of vocational students' ability [J]. *Journal of Jinhua College of Profession and Technology*, 2007(6), p69-73.

[4] Huang Renwei & Xiao Yun. Exploration of vocational competence cultivation of students in higher vocational colleges from the perspective of post competency [J].Adult Education, 2013（1）, p84-85.