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Strategies for Developing the Vocational Creative and Innovation Abilities of University Teachers in Chongqing

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Abstract：

Objective: To develop a survey questionnaire on the professional innovation ability of university teachers in Chongqing. Method: Referring to relevant research literature at home and abroad, and combining the independent variables of the doctoral thesis, a survey questionnaire on the professional innovation ability of university teachers in Chongqing was developed from four dimensions. The reliability and validity of the questionnaire were tested using the SPSS system. Result: By setting up a questionnaire on the professional innovation ability of university teachers in Chongqing, the training and assessment model for university teacher talent in Chongqing can be improved and established. Conclusion: The survey questionnaire on the professional innovation ability of university teachers in Chongqing has high reliability and validity.

Keywords: career creation; Innovation ability; University teachers; Creativity dimension

The professional creativity and innovation of Chinese university teachers are being valued and developed. As the youngest municipality directly under the central government in China, Chongqing's university education is also thriving. At present, many studies mainly focus on the design and implementation of innovation and entrepreneurship education reform plans, or focus on the effectiveness of innovation and entrepreneurship education reform implementation. There is relatively little research on the innovation and creative ability of the leaders who carry out innovation and entrepreneurship education. Therefore, the author selected 397 teachers from ten universities in Chongqing as examples and took the creativity and innovation ability of university teachers as the research object, Analyze the main characteristics and influencing factors of university teachers' creative and innovative behavior, propose the basic connotation of university teachers' innovative ability, and design a developmental evaluation index system for university teachers' innovative ability. From the perspective of empirical research, investigate and analyze the actual level of university teachers' creative and innovative ability to verify the effective relationship between university teachers' creative and innovative ability and their career development.

1 Research Objectives

1.1 To investigate the level of vocational creative and innovation ability of university teachers at Chongqing

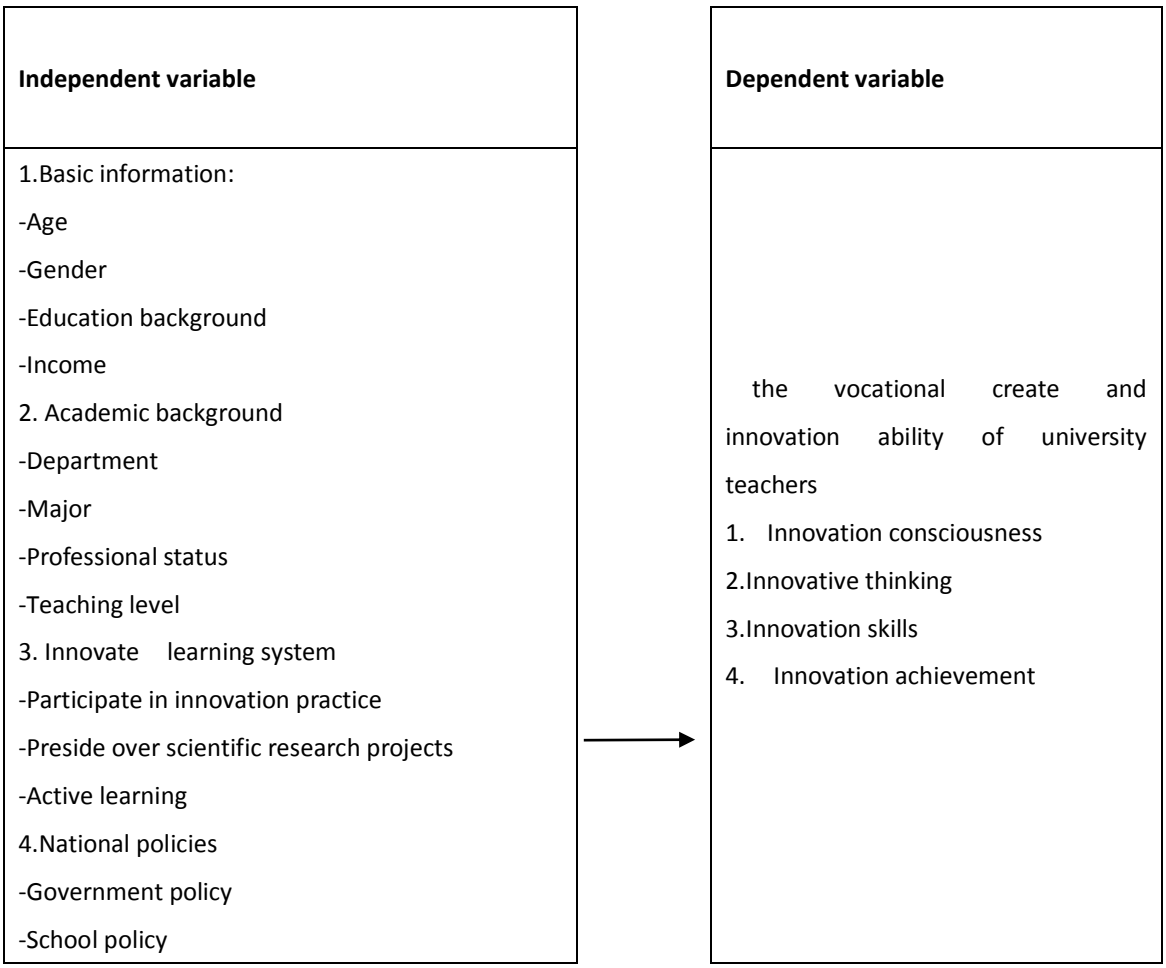
1.2 To examine the factors affecting the level vocational creative and innovation ability of university teachers at Chongqing

1.3 To find ways to develop creative and innovation ability of university teachers at Chongqing

2. Questionnaire Preparation and Testing

2.1Research framework of questionnaire sources

The entire questionnaire is divided into four major sections based on variables: basic information, academic background, innovative learning system, and National policies.



2. 2 Compilation topic

In the early research stage, a combination of open-ended questionnaires and interviews was used to form the original items of the questionnaire. 30 university teachers were selected from ten universities in Chongqing to conduct an open-ended questionnaire survey and organize the project. During this stage, a total of 50 questions were formed. After three Chinese experts further reviewed the project, it was reviewed by Thai IOC experts and ultimately formed a survey questionnaire for 32 projects.

Using the Likert 5-point scale, '1' to '5' represent 'very important' to 'very unimportant', respectively. In this survey, there is an open-ended question after the questionnaire stating "In addition to the

above items, if there are any supplementary descriptions of the innovation ability of university teachers, please fill them in below". No new items were generated in the final questionnaire collection. Finally, we need to obtain the total number of surveys in the preparation stage, the number of valid questionnaires, the number of males, females, average age, and so on. Analyze convenient sampling data, calculate the total score of 32 items, and calculate the correlation between each item and the total score. If the correlation coefficient between missing and total score is<0.3, the final form of the questionnaire is valid. In order to have more space for in-depth research in the future, this survey questionnaire has half more questions than the predetermined number and is included in the interview section of qualitative research.

3 Project Analysis

Project analysis is the analysis of the quality of each item in a scale, discarding bad items to improve the reliability and validity of the scale. The commonly used method is the total correlation method, which refers to the correlation between each item and the total score of the project. Generally speaking, the correlation coefficient should be at least 0.4 or higher, and questions less than 0.2 should be deleted. This survey questionnaire uses Spaa software to automatically analyze the relevance of the questions.

3.1 Analysis and display of questionnaire data

The "Questionnaire on the Professional Creativity and Innovation of College Teachers in Chongqing" adopts both online and offline methods, and is expected to distribute 397 questionnaires. However, due to the delay in online statistics, 431 questionnaires were filled out in this survey, and 408 valid questionnaires were ultimately collected.

3.1Sample basic information statistics

Project	Category	Number of people	Proportion
Gender	man	109	27.45%
	woman	288	72.54%
Age	20.1~30	16	4.08%
	30.1~40	192	48.36%
	40.1~50	173	43.58%
	50.1~60	8	2.02%
	Over 60 years old	8	2.02%
Job title	junior	61	15.36%
	intermediate	257	64.73%
	Deputy Senior	55	13.85%
	Senior	8	2.02%
	No job title	16	4.03%
Total questionnaire		397	

3.2Questionnaire reliability analysis

There are multiple algorithms for reliability, and this study uses the theta reliability coefficient, which is calculated as follows:

$$\theta = \frac{N}{N-1}(1-\frac{1}{\lambda})$$

In the above equation, N represents the number of analysis items and the maximum eigenvalue value.

From the above equation, it can be seen that as the number of analysis terms increases, the theta reliability coefficient is likely to increase, and the larger the maximum eigenvalue, the larger the theta reliability coefficient value.

Table 3.2 Reliability Analysis of the Questionnaire

Category	Cronbach's Alpha	Number
Basic information	0.636	8
Academic background	0.758	8
Innovate learning system	0.813	8
National policies	0.821	8

3.3Questionnaire validity analysis

Questionnaire validity analysis The validity of th is questionnaire is analyzed by SPSS data. Befor e dataanalysis, you need to check the data, inc luding whether there are Outlier in the data, i nvalid samples, etc. Because the data source is a questionnaire, invalid samples are likely to a ppear, as it is difficult to determine whether t he samples filled in the questionnaire are true or not. Therefore, when designing the question naire itself, it is important to consider the sim plicity, comprehensibility, and ease of operation of filling in the questionnaire.

During subsequent analysis, SPSS software will automatically select valid samples for analysis; Generally, a KMO value greater than 0.6 is required. If there are two analysis items, the KMO value must be 0.5; I will delete the term with lower commonality (common factor variance) values, which can improve the KMO value. If the KMO value is not output, it means that the data quality is poor. If the validity test fails, correlation analysis can be used to examine the correlation. After preliminary screening and deletion, the validity analysis of the remaining 32 items is as follows:

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Commonality
1.Do you think that the age have the effect on vocational create and innovation ability of university teachers?	-0.20	-0.20	-0.02	0.85	0.28	-0.23	-0.07	0.938
2.Do you think that the gender have the effect on vocational create and innovation ability of university teachers?	0.08	0.06	-0.10	0.11	0.94	-0.11	0.04	0.925
3.Do you think that the education background have the effect on vocational create and innovation ability	-0.15	-0.06	0.26	0.42	0.73	0.25	-0.26	0.938

of university teachers?								
4.Do you think that the income have the effect on vocational create and innovation ability of university teachers?	0.06	-0.38	0.40	-0.30	0.69	0.06	-0.07	0.888
5.Do you think that the department have the effect on vocational create and innovation ability of university teachers?	0.72	0.10	-0.35	0.14	0.12	0.24	0.24	0.800
6.Do you think that your major have the effect on vocational create and innovation ability of university teachers?	0.26	-0.10	0.04	0.91	-0.09	0.16	0.11	0.959
7.Do you think that the professional status have the effect on vocational create and innovation ability of university teachers?	0.37	0.33	0.79	-0.10	0.03	-0.09	0.13	0.901
8.Do you think that the teaching level have the effect on vocational create and innovation ability of university teachers?	0.54	-0.21	0.67	0.40	0.00	-0.04	-0.08	0.952
9.Do you think that the participate in innovation practice have effect on vocational create and innovation ability of university teachers?	0.23	0.20	0.87	-0.22	0.00	0.25	-0.03	0.966
10.Do you think that the preside over scientific research projects have effect on innovation and entrepreneurship?	0.48	0.76	0.20	-0.03	0.28	-0.14	0.15	0.967
11.Do you think that the active learning have effect on vocational create and innovation ability of university teachers?	0.07	0.91	0.14	-0.15	-0.29	-0.10	-0.05	0.975
12.Do you think that the personnel assessment system have effect on vocational create and innovation ability of university teachers?	0.23	0.91	-0.06	-0.16	0.17	0.07	0.15	0.964
13.Do you think that the government policy have an effect on vocational create and innovation ability of university teachers?	0.65	0.09	-0.17	0.29	0.17	0.48	0.07	0.799
14.Do you think that the school policy have an effect on vocational create and innovation ability of university teachers?	0.12	-0.23	-0.14	-0.02	0.04	0.90	0.20	0.931
15.Do you think of the degree to which schools have implemented the national policy on creativity and innovation in the university teachers?	0.10	-0.04	-0.85	-0.33	-0.11	0.14	0.08	0.888

16.Do you think your university's policy on creativity and innovation in the university teachers has affected you?	0.20	-0.01	-0.77	0.05	-0.19	0.50	0.02	0.917
17.Do you think that innovation motivation make university teachers have more innovation consciousness?	0.65	0.55	0.08	-0.16	0.10	-0.05	-0.38	0.914
18.Do you think that innovation interest make university teachers have more innovation consciousness?	0.52	0.69	0.42	-0.04	-0.02	-0.00	-0.18	0.955
19.Do you think that innovation emotion make university teachers have more innovation consciousness?	0.87	0.34	0.21	0.01	0.06	0.17	-0.06	0.964
20.Do you think that innovation volition make university teachers have more innovation consciousness?	0.75	0.11	-0.12	-0.06	0.34	0.36	0.15	0.859
21.Do you think divergent thinking is conducive to improving the innovative thinking of university teachers?	0.66	-0.08	-0.60	0.18	0.19	-0.17	0.11	0.919
22.Do you think logical thinking is conducive to improving the innovative thinking of university teachers?	0.71	0.46	-0.10	0.12	-0.21	-0.26	0.21	0.893
23.Do you think reverse thinking is conducive to improving the innovative thinking of university teachers?	0.13	0.20	-0.13	0.07	-0.04	0.32	0.85	0.912
24.Do you think critical thinking is conducive to improving the innovative thinking of university teachers?	0.10	0.69	-0.01	-0.03	-0.28	0.10	0.41	0.747
25.Do you think learning ability can improve the creative skills of university teachers?	0.17	0.66	0.50	0.00	-0.04	-0.10	0.50	0.980
26.Do you think cooperation ability ability can improve the creative skills of university teachers?	0.79	0.29	0.30	-0.35	-0.18	0.04	-0.17	0.977
27.Do you think practice ability ability can improve the creative skills of university teachers?	0.85	0.18	0.13	0.14	0.05	-0.09	0.31	0.894
28.Do you think innovation ability ability can improve the creative skills of university teachers?	0.87	0.02	0.09	-0.35	-0.20	0.19	-0.14	0.974

29.Do you think the teaching achievement can reflect the Innovations achievement of university teachers?	0.91	-0.02	0.04	0.10	0.11	0.02	0.27	0.927
30.Do you think the scientific research achievement can reflect the Innovations achievement of university teachers?	0.75	0.21	0.36	-0.25	-0.15	0.03	-0.03	0.826
31.Do you think the team achievement can reflect the Innovations achievement of university teachers?	0.82	0.31	0.08	0.14	-0.16	0.14	-0.02	0.835
32.Do you think the students achievement can reflect the Innovations achievement of university teachers?	0.26	0.35	0.21	-0.20	-0.13	0.61	0.53	0.942
Variance Explanation Rate % (before rotation)	36.57%	15.96%	12.80%	8.27%	7.54%	6.58%	3.62%	-
Cumulative variance explained rate % (before rotation)	36.57%	52.52%	65.32%	73.59%	81.13%	87.72%	91.34%	-
Eigenroot value (after rotation)	9.14	5.16	4.81	2.79	2.71	2.44	2.18	-
Variance Interpretation Rate % (after rotation)	28.56%	16.13%	15.03%	8.72%	8.47%	7.62%	6.81%	-
Cumulative variance explained rate % (after rotation)	28.56%	44.69%	59.72%	68.44%	76.90%	84.52%	91.34%	-
KMO value	0.87							-
Bart spherical value	0.049							-
Df	376							-
p-value	0.045							-

The KMO value is 0.87, which is close to 1, indicating a strong correlation between variables. The original variable is more suitable for cooperative factor analysis. The Bartlett test corresponds to a p-value less than 0.05, which also indicates that factor analysis is suitable. Comparing the overall conclusions of this study, it is found that university teachers in Chongqing have very high expectations for "career creation and innovation", as well as a high level of

understanding of related developmental issues. All questionnaire data is authentic and feasible.

4 Conclusion

4.1 The development of the Chongqing College Teachers' Professional Creativity and Innovation Survey Scale is mainly based on the four dimensions of variables that diverge from the doctoral thesis research, and involves project selection, addition, deletion, or language changes. This can to some extent lead to cross validity issues in the scale. The simple scale of 32 projects ultimately established is divided into 4 dimensions to comprehensively analyze the current situation and development of the professional creativity of university teachers in Chongqing. At the same time, guided and evaluated by Chinese and Thai experts, the scale has real operability and practicality, providing a reference basis for the development of multi-dimensional cultivation of creativity and innovation for university teachers.

4.2 The development of the Chongqing College Teachers' Professional Creativity and Innovation Survey Scale is divided into four dimensions based on the variables in the research paper: basic information, academic background, innovative learning system, and relevant national policies. In the confirmatory factor analysis of the questionnaire, various fitting indices were good, and the model had high validity. Further reliability analysis was conducted, and the results showed that the alpha coefficients of each dimension met the statistical requirements.

4.3 From the perspective of questionnaire construction in various dimensions, this questionnaire basically meets the requirements of the creative and innovative survey of university teachers in Chongqing. However, there is still room for further revision of the questionnaire, mainly reflected in the measurement and testing of more dimensions. The preparation of the survey questionnaire is only a preliminary attempt and cannot be comprehensive. For example, the social identity issue of professional creativity among university teachers. This survey questionnaire was only developed from the perspective of university teachers or relevant educators themselves. However, social recognition is also an important field of professional identity among university teachers, and the scope and standards of social recognition are currently not comprehensive and systematic, The evaluation system for the professional creativity of university teachers in Chongqing by social groups also needs to be tested in future research, and more effective dimensions may be added for compilation and research.

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