

Li Wei*Post-Graduate of the
Sumy National Agrarian University***Ли Вей***аспірант**Сумського національного аграрного університету***Ли Вэй***аспирант**Сумского национального аграрного университета*

ORCID: 0000-0001-9855-229X

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**COMPILATION OF COMPETENCY SCALES
FOR TEACHERS IN LOCAL COLLEGES
AND UNIVERSITIES IN CHINA****СКЛАДАННЯ ШКАЛИ КОМПЕТЕНТНОСТІ
ДЛЯ ВИКЛАДАЧІВ У МІСЦЕВИХ КОЛЕДЖАХ
ТА УНІВЕРСИТЕТАХ КИТАЮ****СОСТАВЛЕНИЯ ШКАЛЫ КОМПЕТЕНТНОСТИ
ДЛЯ ПРЕПОДАВАТЕЛЕЙ В МЕСТНЫХ КОЛЛЕДЖАХ
И УНИВЕРСИТЕТАХ КИТАЯ**

Summary. At present, the human resource management department of Chinese universities usually adopts result-oriented methods to evaluate teachers' performance, focusing on the teachers' teaching effects, scientific research results, etc. The diagnostic is what the teachers have done without considering what the teachers can do, that is, the teacher's Potential. Teachers' grades, intelligence, and abilities should be the criteria and basis for evaluating teachers, while competence is a comprehensive manifestation of teachers' external and implicit qualities. In order to make up for the shortcomings of the current teacher performance evaluation, we propose that teacher evaluation should measure the competence of teachers. Therefore, it is necessary to research and develop teachers' competency assessment tools.

This study uses a comprehensive combination of quantitative and qualitative research methods. It collects teacher competency vocabulary through the use of questionnaire survey method, interview method and document method, and finally retains 30 competency vocabulary through the expert group discussion method (Delphi method) and compiles them into competency vocabulary.

The purpose of the article is that based on research methods, a self-assessment questionnaire for the competence of teachers of Chinese colleges will be modeled for use as an effective tool for assessing the competence of teachers.

Through the use of questionnaire survey method, interview method, document method and Delphi method, the competency vocabulary was collected and sorted out, and a vocabulary questionnaire was formed. Through questionnaire survey and exploratory factor analysis, a competency model of local colleges and universities composed of 4 principal components and 22 secondary indicators is obtained.

Key words: local colleges and universities, teacher competence, teacher evaluation, model, indicators.

Анотація. На сьогодні система управління людськими ресурсами в китайських університетах зазвичай базується на застосуванні методів, орієнтованих на результат, тобто оцінка діяльності викладачів здійснюється на підставі врахування методики викладання науково-педагогічних працівників, результатів наукових досліджень тощо. Діагностика – це аналіз

результатів роботи викладачів, не враховуючи інші гії, які викладачі можуть зробити, тобто їх потенціал. Оцінка кмітливості та здібностей викладачів повинна бути критеріями та основою для діагностики, тоді як компетентність є всебічним проявом зовнішніх та імпліцитних якостей викладачів. Для того, щоб компенсувати недоліки поточного оцінювання результатів діяльності викладачів, вважаємо за потрібне, щоб оцінка базувалася на врахуванні відповідних компетенцій. Відповідно, актуальним є дослідження та розробка інструмента оцінки компетентності викладачів.

У науковій статті використовується комплексна комбінація кількісних та якісних методів дослідження. Зазначене дослідження передбачає оцінку компетентностей викладачів за допомогою методу опитування, методу співбесіди та методу документування і базується на 30 базових компетентностях за допомогою методу обговорення експертних груп (метод Дельфи) та об'єднує їх у базу компетентностей.

Мета статті полягає в тому, що на підставі методів наукового дослідження буде змодельовано анкету самооцінки викладачів китайських коледжів для використання її у якості ефективного інструмента оцінки компетентностей науково-педагогічних працівників.

За допомогою методів опитування, інтерв'ювання, документування та методу Дельфи було узагальнено та відібрано базовий перелік компетентностей та сформовано опитувальник. Завдяки опитуванню та дослідницькому факторному аналізу отримана модель компетентності місцевих коледжів та університетів, що складається з 4 основних компонентів та 22 вторинних показників.

Ключові слова: місцеві коледжі та університети, компетентність викладачів, оцінка, модель, показники.

Аннотация. В настоящее время система управления человеческими ресурсами в китайских университетах обычно базируется на применении методов, ориентированных на результат, то есть оценка деятельности преподавателей осуществляется на основании изучения методики преподавания научно-педагогических работников, результатов научных исследований и тому подобное. Диагностика – это анализ результатов работы преподавателей, не считая другие действия, которые преподаватели могут сделать, то есть их потенциал. Оценка логики и способностей преподавателей должна быть критериями и основой для диагностики, тогда как компетентность является всесторонним проявлением внешних и имплицитных качеств преподавателей. Для того чтобы компенсировать недостатки текущего оценивания результатов деятельности преподавателей, считаем нужным, чтобы оценка базировалась на учете соответствующих компетенций. Соответственно, актуальным является исследование и разработка инструмента оценки компетентности преподавателей.

В научной статье используется комплексная комбинация количественных и качественных методов исследования. Данное исследование предполагает оценку компетенций преподавателей с помощью метода опроса, метода собеседования и метода документирования, базируется на 30 базовых компетенциях с помощью метода обсуждения экспертных групп (метод Дельфи) и объединяет их в базу компетенций.

Цель статьи заключается в том, что на основании методов научного исследования будет смоделирована анкета самооценки компетентности преподавателей китайских колледжей для использования ее в качестве эффективного инструмента оценки компетенций научно-педагогических работников. С помощью методов опроса, интервьюирования, документирования и метода Дельфи был обобщен и отобран базовый запас компетенций и сформирован опросник. Благодаря опросу и исследовательскому факторному анализу полученная модель компетентности местных колледжей и университетов, которая состоит из 4 основных компонентов и 22 вторичных показателей.

Ключевые слова: местные колледжи и университеты, компетентность преподавателей, оценка, модель, показатели.

Introduction. The implementation of scientific, fair, and standardized performance evaluation in colleges and universities can not only reflect the ability of teachers more intuitively and truly, but also help to play the incentive role of performance evaluation and give full play to the potential abilities of teachers [1]. The evaluation of teachers should take into account the actual performance and development potential. Teachers' grades, intelligence, and abilities should be the criteria and basis for evaluating teachers, while competence is a comprehensive manifestation of teachers' external and implicit qualities. Mc Clelland published an article "Measuring Competency, Not In-

telligence" in the American Psychologist in 1973, and clearly put forward the concept of "competence" for the first time. He pointed out that school performance, intelligence, and aptitude tests cannot predict career or life achievements, and he advocates replacing them with competency tests [2]. Competency is not only a kind of ability to be competent for the job, but also the comprehensive literacy that an individual has in the face of professional requirements. It is a prerequisite for the completion of professional work. It includes not only personality traits such as role intentions, traits, and motivation, but also industry positions. The required professional knowledge and skills. In

order to better evaluate teachers in local universities and provide a basis for teacher selection, appointment, training, and performance management, it is necessary to construct their competency model. It is even more necessary to develop an effective evaluation tool that can evaluate the performance of teachers' external ability and their implicit qualities. As of the end of 2013, there were 650 local colleges and universities (including private), accounting for 55 of the 1,169 general undergraduate colleges and universities nationwide 6% [3]. In 2014 and 2015, 24 and 22 colleges and universities were upgraded to undergraduate colleges respectively. So far, there are nearly 700 local colleges and universities [4]. Local colleges and universities occupies an important position in the Chinese higher education system. Researchers have worked in local colleges for many years to understand the problems in the human resource management of local college teachers. Therefore, this study chose local college teachers as the research object.

Literature review. The scientists and scholars who currently engaged in Compilation of competency scales for teachers mainly include: Li Hai, Zhao Guang, Sun Weifeng, Zhong Jingyi, Wang Wei, Wu Qiyang, Liu Haiyan, Tan Gang, Zhuolun Mutalifu, Li Xiaojuan, Hu Kehua, He Qizong, Xiong Sipeng, Yan Zhengshu, Liu Xingfeng, Zhang Anfu, Liao Hongjian, Wang Zhenghua.

The purpose of the article. Based on research methods, model a self-assessment questionnaire for the competence of teachers in Chinese colleges to use it as an effective tool for assessing the competence of teachers.

The main results of the research. Through the use of questionnaire survey method, interview method, document method and Delphi method, the competency vocabulary was collected and sorted out, and a vocabulary questionnaire was formed. Through questionnaire survey and exploratory factor analysis, a competency model of local colleges and universities composed of 4 principal components and 22 secondary indicators is obtained. The behavior description of 22 indicators is used to form the initial questionnaire of competency content. The validity of the questionnaire is verified through questionnaire survey and exploratory factor analysis. Through the modification of the questionnaire presentation, the competency content questionnaire was transformed into the final "Local College Teacher Competency Self-evaluation Scale". Through testing, the design of the scale has a certain degree of scientificity, and the scale has good reliability and validity, and can be used as a tool to evaluate the competence of teachers in local universities.

Using the method of literature review, we retrieved 689 literatures from 2010 to 2020 in China's largest literature database China HowNet and Web of Science with the theme of "University Teacher Competence". After careful study, it was found that 17 of them were related to the construction of competency models. We sorted the terms of competency of college teachers described in this article, and obtained a total of 343 terms of competence (second-level indicators).

Through semi-open interviews with a total of 30 university teachers, university human resources management personnel, and education experts, we obtained 103 words of competency for university teachers. We merged and de-duplicated a total of 462 college teacher competency entries obtained from the two ways, and finally obtained 50 college teacher competency entries.

We invite 20 experts who are engaged in university educational administration management, teaching theory research and work in the front line of teaching as members of the expert group of the scientific research group. From the perspective of professional titles, 16 experts are named professors and 4 associate professors; from the perspective of expert' academic qualifications, 18 PhD degree holders and 2 master degree holders are professor titles; from a professional point of view, there are 12 liberal arts experts, 8 science and engineering experts, and the expert members are professionally representative and authoritative. Through the research and discussion of the 50 college teachers' competency terms obtained above, the expert team finally retained 30 of them as the characteristic vocabulary of local college teachers' competency.

We adopted the 7-level scoring system of the Richter Scale for the 30 competency entries finalized by the expert group. A questionnaire survey was conducted with teachers from local colleges and universities as the survey subjects. Convenient sampling methods are used to select teachers from more than 20 local colleges and universities in 8 provinces and cities in eastern China (Shandong, Guangdong), central (Henan, Hebei, Hubei), and western (Xinjiang, Sichuan, Chongqing) As a research object, we distributed electronic questionnaires to them and collected 608 copies, which was 100% effective. This paper divides the recovered 608 competency vocabulary questionnaires into two groups using IBM SPSS Statistics 22.0 random sampling. The 312 data whose grouping variable is "0" is sample A, and IBM SPSS Statistics 22.0 is used for exploratory factor analysis to preliminarily determine the structural factors of the scale; The 296 data whose grouping variable is "1" are sample B. IBM SPSS Amos 23 is used to perform confirmatory factor analysis to test whether the factor structure

model of the scale is consistent with the results of actual data collection.

Through research, we have obtained a competency model of local college teachers composed of 4 first-level indicators and 22 second-level indicators. By consulting relevant documents and dictionaries, combined with the opinions of the expert group, we finally determined the competency model indicators for local colleges and universities in China (table 1).

By querying the dictionary and combining the opinions of the expert group, we described the 22 indicators in the model in detail and converted them into the competency content questionnaire. The pre-survey was conducted by issuing the content questionnaire to test the reliability and validity of the content questionnaire. Verify the competency model established before and form the final “Local College Teacher Competency Scale”.

Mansfield, M. (2000) once pointed out: “What model is the best? This model must meet the needs of its main users. Each type of competency should be conceptually connected but different from each other. Behavior description It should be clear and properly worded. The model should be concise, if it includes too much competency and behavior description, the

reading and use of the model will feel heavy. Moreover, a good model should leave room for supplements, which can be used at any time according to different situations. Supplement and update its components”. In theory, the more detailed behavior description should measure the more accurate the competence, but in practice, too many and too complicated descriptions can easily make the testee bored. After the practice of the content questionnaire survey, we also felt this, so we decided to replace 2–3 behavior descriptions with one sentence of behavior description in a competency vocabulary, reducing the number of items and reducing the workload for the testees. The conclusion drawn should be more accurate [5]. Drawing on the experience and lessons of previous researchers, we consulted professional dictionaries and related literature, and organized experts to conduct three group discussions to comprehensively and accurately define each competency vocabulary of the four-factor model explored before. As a result, An “Initial Questionnaire on the Competency of Local College Teachers” composed of 22 behavior descriptions was formed. The questionnaire adopts the 7-level scoring system of the Richter Scale. Among them, “1” means very unimportant; “2” means not important; “3” means less important; “4” means

Table 1

Indicators of competency model for teachers in local universities in China

Dimension	Number	Index
Research Competence	1	The ability to obtain and use information
	2	Creative thinking ability
	3	Logic analysis ability
	4	Critical thinking skills
	5	Master the frontier dynamics of the subject
	6	Research persistence and focus
	7	Ability to find and solve problems
Basic Quality	8	Interpersonal communication skills
	9	Teamwork
	10	Self-confidence
	11	Compressive ability
	12	Caring for students
	13	Sound personality
Teaching competency	14	Love teaching
	15	Teaching methods and skills
	16	Classroom organization
	17	Learning ability
	18	language expression skills
	19	Professional knowledge reserve
Social service competence	20	Promote school-enterprise cooperation capabilities
	21	Scientific research transformation ability
	22	Project management ability

fair; “5” means more important; “6” means important; “7” means very important.

The research objects are teachers from local colleges and universities. We use convenient sampling methods to select Qingdao University, Zhaoqing Normal University, etc. in eastern China (Shandong Province, Guangdong Province); Henan University, Henan Normal University, Henan University of Science and Technology, and Hebei Province in central China (Henan Province, Hebei Province, and Hubei Province) Universities, etc.; teachers from more than 20 local colleges and universities in 8 provinces and cities including Xinjiang Normal University, China West Normal University, Chongqing Three Gorges

College in the west (Xinjiang, Sichuan, and Chongqing) were surveyed. Distributed electronic questionnaires to them and collected 301 copies of which were 298 valid questionnaires, with an effective rate of 99%. The recovered valid samples are processed using IBM SPSS Statistics 22.0 software, and the reliability and validity of the content questionnaires are tested through data analysis of the valid questionnaires to further verify the competency model of local college teachers established before.

Use IBM SPSS Statistics 22.0 software to carry out exploratory factor analysis on each item of the competency content questionnaire for local university teachers, verify the rationality of the relevant mea-

Table 2

KMO and Bartlett sphere test of exploratory factor analysis sample of teacher group competency content

Kaiser-Meyer-Olkin measures the adequacy of sampling		.949
Bartlett's sphere test	Approximately Chi-square	5407.304
	df	231
	Significance	.000

Table 3

Exploratory factor analysis results of the competency content of teachers in local colleges and universities

Indicators	Original data				Re-adjusted			
	1	2	3	4	1	2	3	4
Love education			.634				.787	
Learning ability			.395				.611	
language expression skills			.421				.593	
Teaching methods and skills			.495				.662	
Classroom organization			.480				.641	
Professional knowledge reserve			.410				.611	
Caring for students		.392				.585		
Interpersonal communication skills		.740				.840		
Teamwork		.637				.759		
Self-confidence		.511				.676		
Compressive ability		.517				.648		
Sound personality		.372				.548		
Creative thinking ability	.575				.721			
The ability to obtain and use information	.567				.781			
Logic analysis ability	.515				.693			
Master the frontier dynamics of the subject	.556				.663			
Critical thinking skills	.548				.648			
Ability to find and solve problems	.462				.621			
Research persistence and focus	.557				.661			
Promote school-enterprise cooperation capabilities				.992				.842
Scientific research transformation ability				.942				.828
Project management ability				.838				.769

Table 4

Self-evaluation Scale of Teacher Competency of Local Colleges and Universities

Dimension	Competency vocabulary	Behavior description	Very inconsistent- Very much in line
Research Competence	Creative thinking ability	My thinking activities are creative and innovative, not sticking to conventions; I can raise and solve problems creatively.	1 2 3 4 5 6 7
	The ability to obtain and use information	I can effectively obtain information in subject areas; I can efficiently use information to promote problem solving.	1 2 3 4 5 6 7
	Logic analysis ability	I can observe, compare, analyze, synthesize, abstract, generalize, judge, and reason about things.	1 2 3 4 5 6 7
	Master the frontier dynamics of the subject	I understand the development trend of the research field of this subject and the key issues restricting the development of this subject.	1 2 3 4 5 6 7
	Critical thinking skills	I can use certain criteria to evaluate thinking and improve my thinking.	1 2 3 4 5 6 7
	Ability to find and solve problems	I can find contradictions in work and life, and use resources to resolve contradictions and promote the development of things.	1 2 3 4 5 6 7
	Research persistence and focus	I have remained unchanged for a long time in my research field, and the research questions are more concentrated and in-depth.	1 2 3 4 5 6 7
	Interpersonal communication skills	I can communicate effectively with others.	1 2 3 4 5 6 7
	Teamwork	I can efficiently cooperate with other members of the team to achieve the maximum work efficiency of the team.	1 2 3 4 5 6 7
	Self-confidence	I have a high degree of trust in my ability to successfully complete the work.	1 2 3 4 5 6 7
Basic Quality	Compressive ability	I can bear and regulate the psychological pressure and negative emotions caused by adversity.	1 2 3 4 5 6 7
	Caring for students	I often take the growth and development of students at heart; I like students and consider problems from the needs and interests of students.	1 2 3 4 5 6 7
	Sound personality	My physical, psychological, moral, and social elements are unified, balanced, and coordinated.	1 2 3 4 5 6 7
	Love teaching	I can get a sense of happiness, accomplishment and satisfaction from my teaching work, and I am willing to continue my teaching work.	1 2 3 4 5 6 7
	Teaching methods and skills	I can use a variety of technologies to improve teaching methods and methods to improve teaching effects; I master modern teaching methods, and can skillfully use the Internet to collect, organize, and use various information materials for teaching services.	1 2 3 4 5 6 7
	Classroom organization	I can organize classroom teaching well, control the classroom atmosphere, and have good classroom interaction with students.	1 2 3 4 5 6 7
	Learning ability	I have shown high perception and observation ability, memory ability, reading ability, and problem-solving ability in learning activities.	1 2 3 4 5 6 7
	language expression skills	I use accurate words, clear meaning, proper structure, concise sentences, and conform to norms. I can express objective concepts clearly, accurately, coherently, and decently, without language problems.	1 2 3 4 5 6 7
	Professional knowledge reserve	I am familiar with the theoretical and practical knowledge of this major, have my own theoretical results and research system, and have authority in the professional field.	1 2 3 4 5 6 7
	Promote school-enterprise cooperation capabilities	I can promote the exchange of information between schools and enterprises, promote continuous and efficient cooperation between schools and enterprises, and achieve a win-win situation.	1 2 3 4 5 6 7
Social service competence	Scientific research transformation ability	I can test, develop, apply, and promote the results of scientific research and technological development, so as to form new products, new processes, and new materials, develop new industries, and promote the development of social productivity.	1 2 3 4 5 6 7
	Project management ability	I can use professional knowledge, skills, tools and methods to make the project meet or exceed the set requirements and expectations with limited resources.	1 2 3 4 5 6 7

surement items, and form a formal competency content questionnaire after discussion by experts.

Before doing exploratory factor analysis, the KMO and Bartlett's values of the variables should be tested. The results are shown in the table. It can be seen from Table 2 that the index of the sample suitability coefficient KMO of the teacher group is 0.949, indicating that the data is very suitable for factor analysis. In addition, the Bartlett sphere test chi-square value is 5407.304, the degree of freedom is 231, and the significance P value is 0.000. The sphere hypothesis is rejected, indicating that the questionnaire items are not independent and the value is valid. The results of both indicators show that the data is very suitable for factor analysis.

We use IBM SPSS22.0 software to conduct exploratory factor analysis on the competency content questionnaire for teachers in local colleges and universities, and extract 4 factors according to the fixed number of factors. The load on a certain factor is greater than 0.5, and there is no cross load, that is, it is not. Both factors have a standard extraction factor with a load exceeding 0.5. After orthogonal rotation, a total of 4 factors were extracted, and the variance explanation rate was 74.166, which passed the validity test of exploratory factor analysis (table 3).

Through the factor analysis of the competency content questionnaire of local college teachers, it can be seen that the dimensional division of the exploratory factor analysis of the vocabulary questionnaire is basically the same, which also verifies the scientificity of the previous model construction results. Combining the factor analysis results of the content questionnaire, the final competency content questionnaire was obtained after expert group discussion. The questionnaire included 22 items in 4 dimensions. Finally, modify the statement method, such as: the description of self-confidence in the content questionnaire is: "I have a high degree of confidence in my ability to successfully complete the work." Then change the description method to: "I believe I can successfully complete the work. The

option is modified to a seven-level evaluation ranging from "very consistent" to "very non-compliant". In this way, the content questionnaire on the competency of local college teachers is converted into a self-evaluation scale for the competence of local college teachers (Table 4). Through testing, the design of the scale has a certain degree of scientificity, and the scale has good reliability and validity, and can be used as a tool to evaluate the competence of teachers in local universities.

In the previous research on scale development, there are two main ways to generate scale items: one is the thematic research method, based on the defined concepts, through focus group interviews, experimental observations, and expert consultation methods., Self-created scale entries; the second is the method of objective research, on the basis of literature research, find out the existing measurement scales in the literature and cite them [6]. This study combines the above two methods of scale entry preparation, and this research method has a certain degree of innovation.

The main problems in the study: First, the study lacks the measurement scale to be tested in practical applications. The second is the lack of comparison between the measurement results of the scale and the subjects' performance in real work.

Conclusions. By using scientific methods, we have established a four-factor model of the competence of teachers in local universities in China. The model contains 22 indicators. Through questionnaire surveys and other methods, a self-assessment questionnaire for teachers' competence in Chinese local colleges and universities has been developed. After testing and sampling, it is effective and can be used as a tool for evaluating the competence of Chinese college teachers.

Further research direction: follow-up research we will conduct research on the actual application of the scale, and compare the measurement results with the specific performance of teachers in actual work, and further test the scientificity and feasibility of the scale developed in this article.

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