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The core competencies for Chinese language teachers in Taiwan:
A Multiple Criteria Decision Making approach

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A Dissertation Submitted to The Graduate School at the
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for the degree Doctor of Education

December, 2018

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ABSTRACT

There were two research questions in this study: what are the most important competencies for Chinese language teachers; and what is the priority for the competencies? This study applied the DEMATEL to analyze competencies from 15 experts. The results showed that competencies were categorized into four dimensions. They were Culture, Instruction, Communication, and Professional Development. Each dimension had multiple criteria. There were three kinds of criteria under the dimension of Culture. They were ‘global awareness,’ ‘intercultural communication,’ and ‘Chinese culture.’ The dimension of Instruction had three kinds of criteria. They were ‘instructional perspective,’ ‘teaching method,’ and ‘assessment.’ There were three kinds of criteria under the dimension of Communication. They were ‘oral Chinese,’ ‘learner's language,’ and ‘expression ability.’ Finally, the criteria of ‘Chinese grammar,’ ‘use of technology,’ and ‘collaborate with colleagues’ were categorized under the dimension of Professional Development. Overall, the four dimensions from the literature review were divided into 12 criteria. In the aspect of four dimensions, the sequence in terms of the degree of influence was ‘instruction,’ ‘professional development,’ ‘communication,’ and ‘culture.’ In general, the ‘instruction’ was considered by the experts as a most important dimension of competency for Chinese language teachers. In the aspect of 12 criteria, the sequence in terms of the degree of influence was ‘instructional perspective,’ ‘teaching method,’ ‘Chinese grammar,’ ‘collaboration with colleagues,’ ‘use of technology,’ ‘oral Chinese,’ ‘intercultural communication,’ ‘learner's language,’ ‘expression ability,’ ‘global awareness,’ ‘Chinese culture,’ and ‘assessment.’ In general, the ‘instructional perspective’ was considered by the experts as a most important criterion of competency for Chinese language teachers. Findings can be used to improve the quality of Chinese language teachers in many ways.

Keywords: Chinese language teacher, Multiple Criteria Decision Making,
Decision Making Trial and Evaluation Laboratory

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DEDICATION

This dissertation is dedicated to my father, Gong-peir Lan, whose words of encouragement kept me motivated and focused on the future, especially when I wanted to give up. He lifted my spirits and made me feel confident. Although my father passed away on August 18, 2018, I will always remember everything he did for me.

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CHAPTER 1: INTRODUCTION

Background of the Problem

According to the statistics, there are approximately 1.15 billion people that speak the Chinese language (refer to Modern Standard Chinese, or Putonghua) around the world (“List of languages by total number of speakers 20th edition”). The Chinese language has received more and more attention from many countries, and even the United Nations (2018) has listed it as one of the world’s official languages.

As the number of foreign students in Taiwan is obviously increasing (Figure 1), learning the Chinese language has received more attention than before. Official statistic from Ministry of Education (2018) in Taiwan showed that Chinese language centers have been founded in 57 Taiwanese universities and offered Chinese language courses for foreign students.

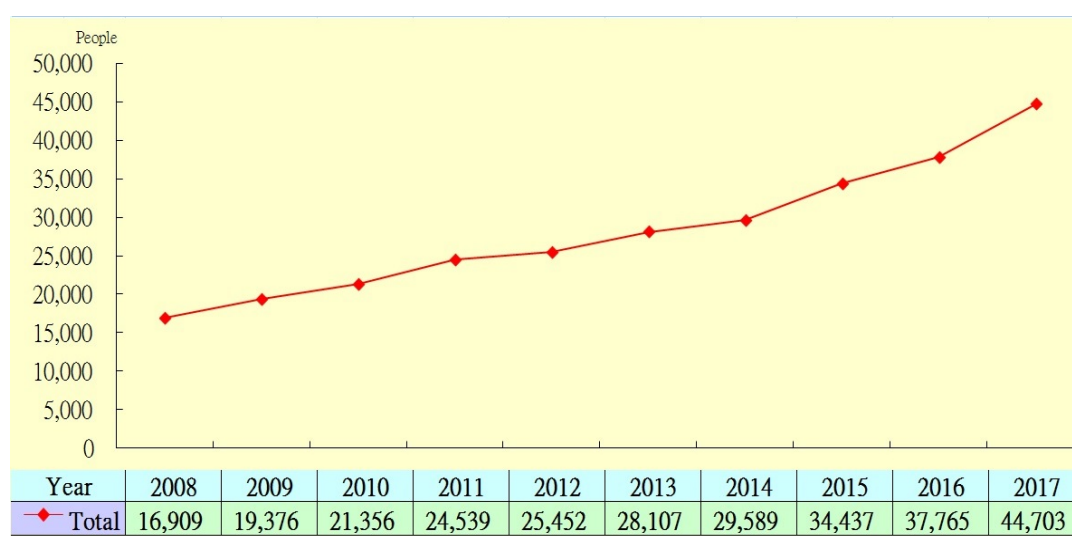


Figure 1: Number of foreign students in Taiwan, the Ministry of Education.

Along with the growth of foreign students in Taiwan, universities and Centers for the Chinese Language need to open more Chinese language classes and improve the teaching effectiveness of the Chinese Language to meet the need for Chinese language learning. The Chinese Language Centers must provide foreign students with a complete Chinese language learning program and many favorable factors for learning Chinese.

Furthermore, due to the trend of internationalization, foreign spouses have constantly increased in Taiwan (Figure 2). Since the Chinese language is necessary for these new immigrants in this land, the need for Chinese language classes obviously increases to meet the needs for foreign spouses, too (National Immigration Agency, Taiwan, 2018).

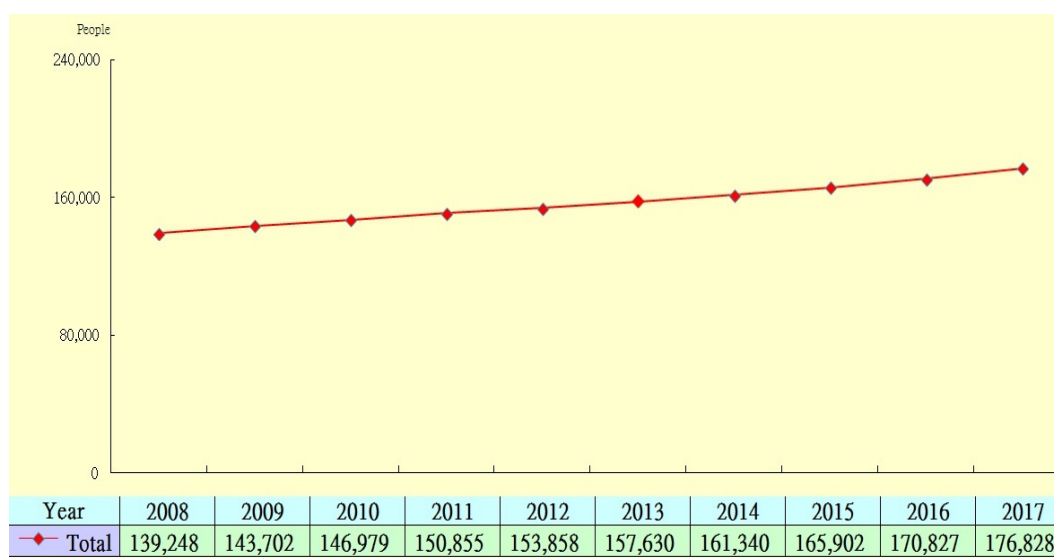


Figure 2: Number of foreign spouses in Taiwan, National Immigration Agency.

In order to meet the global demand for Chinese language education, the Ministry

of Education (2018) in 2013 implemented the Eight-year Chinese Language Education Promotion Plan in Taiwan. It is one of the main goals for this plan to improve the quality of Chinese language teachers and promote specialization. The question may be asked regarding how to train skilled professional Chinese language teachers. It is a key work focus for the Ministry of Education (2018) to promote learning Chinese in Taiwan.

Statement of the Problem

Under the circumstances of continuous increase in demand of Chinese language classes, there are two main problems that have been found. First of all, this situation caused a shortage of qualified teachers in Taiwan. Secondly, there were some current teachers' qualifications who did not meet the requirements of the Chinese language teacher. Thus, Chinese language education has faced the great challenge of promoting the Chinese language teacher competencies for the former issues (Tsai & Wang, 2015).

Due to many factors, such as the long history of development, many dialects, and cultural diversity, the Chinese language is not only difficult to learn for foreigners but also difficult to learn for Chinese people (Dong, 2014; Weng, 2010). Many Chinese people admit that the Chinese language is hard to learn and use, even harder to teach foreigners (Lu, 2010; Tsay, & Prathummanee, 2013). Under such language learning

difficulties, what are the important things for helping foreign students to learn the Chinese language in Taiwan?

One study shows that the Chinese language teacher plays the most important role to help foreign students learning Chinese in Taiwan (Liao, 2011) . Therefore, improvement of the quality of the Chinese language teacher was determined to be the first priority of the Chinese language teaching policy for the authority in Taiwan.

Consequently, Chinese language teacher education is at an important turning point. There is urgency for high quality Chinese language teacher education. Scholars should engage in more studies about the issue of unqualified Chinese language teachers in Taiwan (Hung, 2013).

Yet, how can we evaluate the Chinese language teacher in Taiwan? What kind of competencies should be considered in the Chinese language teacher's professional training? How can the Chinese language teachers be equipped to meet the requirements? What kind of competencies can be used as the qualifications or standards for a suitable Chinese language teacher? These issues are the focus of this study. The researcher sought to determine the core competencies for the Chinese language teacher.

Purpose of the Study

The purpose of this study was to find the competencies which are the most

important factors for Chinese language teacher education, teaching practice and Chinese language teacher self-development in Taiwan. Moreover, this study may provide some suggestions for the government to promote Chinese language teaching. Therefore, we analyzed the competencies of Chinese language teachers from knowledge, skills, and attitudes.

This research proposed to discuss the core capabilities the Chinese language teacher in Taiwan should have. This study aims to investigate the competencies required for teaching Chinese at the university level.

In this study, the Multiple Criteria Decision Making (MCDM) was utilized as an instrument to evaluate competencies for Chinese teachers. Based on Chinese language teaching experts' points of view, we apply the MCDM approach to analyze the critical competencies for the Chinese language teaching and provide suggestions for corresponding training courses.

First of all, the researcher sought to determine the core competencies from the different perspectives, duty, work analysis, and so on for the Chinese language teacher in the literature review. Beyond this, the researcher analyzed the key factors for teaching the Chinese language in Taiwan.

In order to comply with relevant regulations, this study was carried out after the proposal was reviewed by the Institutional Review Board of University of Missouri –

St. Louis.

Research Questions

This study addressed the following research questions:

What are the most important competency dimensions and criteria for Chinese language teachers?

What is the priority order of competencies to be manipulated for developing training courses?

Significance of the Study

The ever-increasing diversity among students, the increase in immigration to Taiwan, and the lack of competency among Chinese language teachers supported the need for this study. This research analyzed the key factors on the teaching of Chinese at the university level.

The findings of this research will provide the Ministry of Education, related Chinese language teaching departments at universities, and Chinese language teachers in Taiwan to consider when to design or implement education for Chinese language teaching to improve the quality of Chinese language teaching practice. The results of this study may help Chinese language teachers to set up their teaching strategies and staff of the Chinese language center to adjust their program management (Orton,

2011).

Limitations and Delimitation of the Study

One limitation of this study is that the teacher competency framework, organized by this study, is based on some Chinese language teaching documents in a convenience collection. The second limitation is the location—Northern Taiwan is the sample for this study, not all of Taiwan. The third limitation is that this study focuses on the ‘university level’ Chinese language teacher, not teachers in general.

The delimitation of this study is limited to the competencies required for teaching Chinese at the university level in Taiwan. Therefore, the results cannot be generalized to other levels and areas, which may have different cultures and environmental conditions. In addition, since this research applies the MCDM approach to analyze the critical competencies for the Chinese language teacher, it is focused on studying the experts’ points of view about the core competency for the Chinese language teacher in Taiwan.

Definition of terms

The following is a list of key terms and acronyms were used in this research.

Chinese Language: It refers to the official, common spoken language called Modern Standard Chinese, or Putonghua, which is based on the Mandarin dialect spoken in Beijing.

Multiple Criteria Decision Making (MCDM): It can help the researcher to make choices according to attributes of solution and then find the best decision in a number of solutions.

Decision Making Trial and Evaluation Laboratory (DEMATEL): DEMATEL is a form of MCDM. It can effectively solve complex problems and understand the structure of influence.

Dimension: It refers to a category of competency for the Chinese language teacher.

Criteria: It refers to a factor of competency for the Chinese language teacher.

Pairwise Comparison: It refers to comparing all the dimensions and criteria in pairs.

Overview of the Study

Chapter One provides the introduction of problems, purposes, research questions, significance and limitations of this study.

Chapter Two provides a review of the literature. This includes: related studies, competencies, culture, communication, professional skills and knowledge, teacher development, with a summary that forms the basis for what is to be studied, namely the research questions.

Chapter Three outlines the research methods that were considered and the research design.

Chapter Four creates the findings of this research and the research questions were addressed.

Chapter Five creates the conclusions on the priority order or importance of competencies in different dimensions and criteria, importance of practice, and recommendations for future research.

CHAPTER 2: LITERATURE REVIEW

The purpose of this literature review is to present research that examines the Chinese language teacher competency in Taiwan. Since the trend of learning the Chinese language just has happened recently, few studies have addressed the core competency for the Chinese language teacher, especially in Taiwan. This study obtained research from other related studies for the literature review. The various categories of the literature review include adult education, adult learning, human resource development, Chinese language teaching, second language teaching, foreign language teaching, and Chinese language learning. At the conclusion of this literature review, research questions are proposed to address the Chinese language teacher competency in Taiwan.

Competency for the Chinese language teacher

What is the key element of Chinese teaching for foreign students in Taiwan? Liao's (2011) studies indicated that the teacher was the key element of Chinese teaching for foreign students in Taiwan. Besides, literature from Taiwan shows that foreign students from the Chinese language class paid attention to their teacher's instructional competency, intercultural ability and teaching environment management (Hung, 2013). This was similar to the American scholar Ryan's finding. Ryan (2009)

argued that instructional perspective was an important factor in adult learning foreign language settings.

From a human resource point of view, core competency is the most important knowledge, skills, and abilities to do a designated job (Spencer & Spencer, 1993). What kinds of competencies are the most important knowledge, skills, and abilities for the Chinese language teacher? It is necessary for us to research this issue from related literature (Parry, 1998).

Dimensions for the Chinese language teacher competency

This literature review began with a search of the key element of Chinese teaching for foreign students in Taiwan and the teacher's competency in Chinese language classes. After analyzing articles and original sources cited, this study collated the research results of scholars and proposed that there are four kinds of dimensions for the scholar to research the key factor of a suitable Chinese language teacher for foreign students in Taiwan. The four dimensions are culture, instruction, communication, and professional development (Brown, 2000; Smith, 2000). This study briefly explains them as follows.

In the cross-culture environment, teaching foreign students Chinese language in Taiwan is not to teach Chinese language only, but also the Chinese culture (Hendryx, 2014; Lange, & Paige, 2003). In addition, Chinese language teaching as other

language teaching should have technical skills for instruction (Sherman, Tibbetts, Woodruff, & Weidler, 1999). For example, communication plays a vital role to teach foreign students in Chinese language classroom. Chinese language teachers should have good communication in Chinese and foreign languages to facilitate their students' learning of Chinese language, culture, and so on (Paige, & Stringer, 1997; Sercu, 2005). Furthermore, as digital learning is a new trend in language learning, foreign students like to adopt the digital approach to learn Chinese in Taiwan. Therefore, Chinese language teachers face the need to improve their digital learning capabilities. Obviously, professional development has become an important ability to improve the quality of Chinese teachers (Snezana & Dijana, 2011; Mann, 2005; Wang, 2012).

After an extensive literature review, the table of dimensions for competency of Chinese language teacher (Table 1) has been developed from selecting articles that described culture, instruction, communication, and professional development related to Chinese language teachers.

Criteria for the Chinese language teacher competency

According to the related studies, under the four dimensions, there are 12 kinds of criteria for competency of a suitable Chinese language teacher for foreign students in Taiwan. The 12 criteria can be briefly explained as follows (Table 2 is a bulleted list

of the 12 criteria).

There are three criteria under the dimension of culture. First of all, due to the globalization trend, education of Chinese language teachers in Taiwan has gradually turned to cultivate the ability of global awareness to meet students from all over the world learning Chinese (McDonald, 2011; Jing, 2013). Secondly, intercultural communication is often considered one of the important functions of language teachers (Byram 1972; Moeller & Nugent, 2014). Thirdly, cultural functions are widely used in intercultural environments, teaching Chinese is also teaching Chinese culture (Hendryx, 2014).

Furthermore, the Instructional Perspective of language teachers is highly related to the satisfaction of their students. In a Chinese language teaching setting, Instructional Perspective also plays a very important role. In addition, both teaching and assessment are a significant part of the teaching process too (Billington, 2000; Ryan, 2009). Therefore, instructional perspective, teaching method, and assessment were categorized under the dimension of instruction (Hannah, 2013).

After analyzing the dimension of communication (Canale & Swain, 1980), there are three kinds of criteria for competency of the good Chinese language teacher. First, in order to enhance the learning effectiveness, demonstration of correct voice for language teacher is significant to avoid mixing disturbance. Therefore, Oral Chinese

was the criteria for competency of the good Chinese language teacher. Secondly, scholars believe that some of language teachers' self-confidence comes from their ability to use the learner's language (Seidlhofer, 1999). Thirdly, the teacher's expression ability can help students understand the content of course.

Besides, there are three kinds of criteria under the dimension of professional development (Claire & Adger, 2000; Sherman, Tibbetts, Woodruff, & Weidler, 1999). They are Chinese Grammar, Use of Technology, and Collaborate with Colleagues. Chinese usage laws and regulations refer to the complete organization of words and phrases, short sentences and sentences and the rational organization of articles (Seidlhofer, 1999). In the information age, it was even more important for Chinese language teachers to adopt technology-assisted teaching (Reinders, 2009). Scholars have suggested that teachers' in-service studies should be based on cooperation among teachers (Sherman, Tibbetts, Woodruff, & Weidler, 1999).

Overall, after integrating all collected literature, this study categorized the factors into four dimensions for Chinese language teachers: Culture, Instruction, Communication, and Professional Development. Each Dimension had Multiple criteria. There were three kinds of criteria under the dimension of Culture. They were 'global awareness,' 'intercultural communication,' and 'Chinese culture'. The dimension of Instruction had three kinds of criteria. They were 'instructional

perspective,' 'teaching method,' and 'assessment.' There were three kinds of criteria under the dimension of Communication. They were 'oral Chinese,' 'learner's language,' and 'expression ability'. Finally, the criteria of 'Chinese grammar,' 'use of technology', and 'collaborate with colleagues' were categorized under the dimension of Professional Development. Overall, the four dimensions from the literature review were divided into 12 criteria.

The tables of dimensions and criteria for competencies of Chinese language teacher (Table 1& 2) had been developed from selecting articles that described Global Awareness, Chinese culture, Intercultural Communication, Instructional Perspective, Teaching methods, Assessment, Chinese speaking, Learner language, Expression ability, Chinese Grammar, Use of Technology, and Collaborate with Colleagues related to Chinese language teacher.

Table 1 represents the organization of the dimensions for the Chinese language teacher competency in the light of literature. Each competency dimension is a broad topic area that is essential for caring and educating the Chinese language learner.

Table 1: The Dimensions for competency of Chinese language teacher

<i>Dimension</i>	<i>Explanations</i>	<i>Source</i>
Culture	It can be defined as integration of all kinds of knowledge, attitudes, and skills for human being.	Hendryx, 2014, Cross et al., 1989, Elam et al., 2007, Betancourt, 2003, Midgette & Meggert, 1991 Tsai & Wang, 2015 Jin Jie, Yang Yi, 2002
Instruction	Teachers conduct knowledge, skills, attitudes, and beliefs to students' activities and processes.	Sherman, Tibbetts, Woodruff, & Weidler, 1999
Communication	Sharing information, facts, or attitudes; trying to establish a common understanding and perspective with others or groups.	ACTFL, 2006, Canale and Swain, 1980,
Professional Development	Research found that the single most important variable influencing program success was the professionalism of the teacher. Such demands imply that all teachers of Chinese need continuing support and nurturing in the form of induction, mentoring, and in-service professional development.	Asia Society, 2010, Sherman, Tibbetts, Woodruff, & Weidler, 1999 Claire & Adger, 2000, Tsai, & Wang, 2015 Mann, 2005 Snezana Jovanova-Mitkovska and Dijana Hristovska, 2011 Benson, P., 2001 Lai, 2011 Little, 1995

Note. This table consists of conceptualizations of dimensions, as defined by the corresponding sources.

Each Dimension has Multiple criteria which describe what a Chinese language teacher should know and demonstrate related to that specific competency area. These four dimensions are divided into 12 criteria as the Table 2.

Table 2: The Dimensions and criteria for competency of Chinese language teacher

<i>Dimension</i>	<i>Criteria</i>	<i>Explanations</i>	<i>Sources</i>
Culture	Global Awareness	Due to the globalization trend, the education of language teacher has gradually turned to cultivate the ability of global awareness to meet the students from all over the world.	Partnership for 21st Century Skills, 2009 Jing, 2013 McDonald, 2011
	Intercultural Communication	Since cultural functions are widely used in intercultural environments, teaching Chinese is also teaching Chinese culture.	Byram's, 1997 Moeller, and Nugent, 2014
	Chinese culture	Chinese culture is internalized, accumulated, and permeated in the psychological depth of each generation of Chinese community members.	Dong, 2014
Instruction	Instructional Perspective	The Instructional Perspective of language teachers is highly related to the satisfaction of their students. In a Chinese language teaching setting, Instructional Perspective also plays a very important role.	Ryan, 2009 Richards, 2010 BALEAP, 2008
	Teaching Method	The teaching methods adopted by teachers to complete teaching tasks, and to guide students in their learning.	Sherman, Tibbetts, Woodruff, & Weidler, 1999 Billington, 2000
	Assessment	Assessment is a significant part of the teaching process.	Sherman, Tibbetts, Woodruff, & Weidler, 1999 Billington, 2000
Communication	Oral Chinese	Teacher's correct voice demonstration is significant to avoid mixing disturbance.	Byram's, 1997 Canale and Swain, 1980, Orton, 2011
	Learner's language	Scholars believe that some language teachers' self-confidence comes from their ability to use the learner's language.	Byram's, 1997 Canale and Swain, 1980, Orton, 2011
	Expression Ability	The teacher's expression ability can help students understand the content of course.	Orton, 2011

Table 2: The Dimensions and criteria for competency of Chinese language teacher(continued)

<i>Dimension</i>	<i>Criteria</i>	<i>Explanations</i>	<i>Sources</i>
Professional Development	Chinese Grammar	Chinese usage laws and regulations refer to the complete organization of words and phrases, short sentences and the rational organization of articles.	BALEAP, 2008 Byram's, 1997 Canale and Swain, 1980, Orton, 2011
	Use of Technology	In the information age, it is more important for Chinese language teachers to adopt technology-assisted teaching.	Reinders, 2009, Isis da Costa Pinho, 2013
	Collaborate with Colleagues	Scholars have suggested that teachers' in-service studies should be based on cooperation among teachers.	Sherman, Tibbetts, Woodruff, & Weidler, 1999 Smith, 2000

Note. This table consists of conceptualizations of dimensions, as defined by the corresponding sources.

The relationship between each dimension and their criteria are formed the

Competency Framework of Chinese Language teacher, as shown in Figure 3.

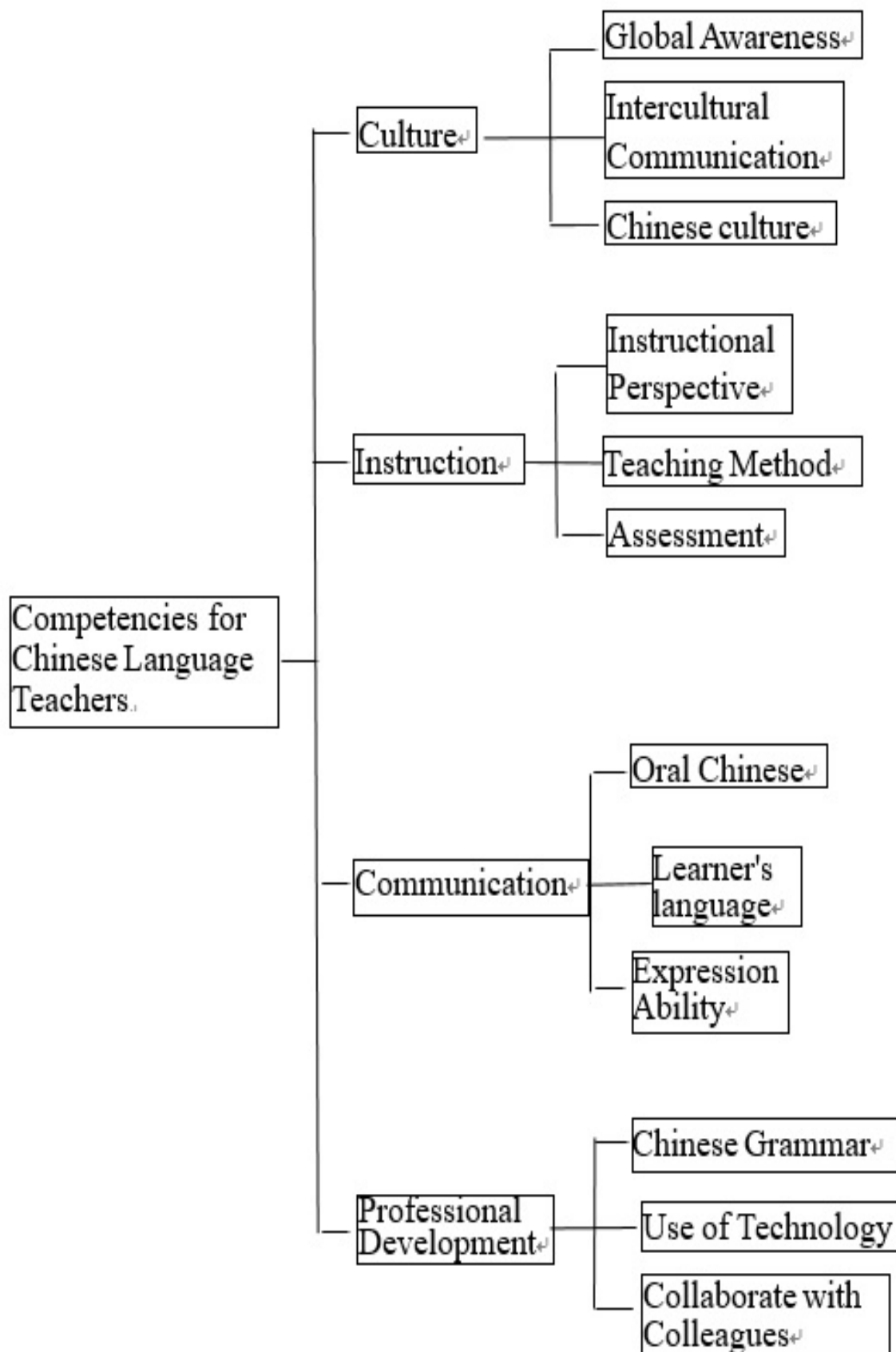


Figure 3 Competencies Framework for the Chinese Language teacher

Summary

Chapter 2 encompasses a review of pertinent studies, including adult education, adult learning, human resource development, second language teaching, Chinese language teaching, and Chinese language learning. Related studies provide a frame of reference for the circumstances that created the satisfaction from Chinese language learning for foreign language students. Particularly, the teacher was the most important element in teaching Chinese language in Taiwan.

The review of literature created research on the competency focused on professional development for Chinese language teacher. Literature can be categorized into four dimensions for Chinese language teachers: Culture, Instruction, Communication, and Professional Development. Each competency dimension is a broad topic area that is essential caring for and educating Chinese language learner.

Furthermore, each Dimension had multiple criteria which describe what a Chinese language teacher should know and demonstrate to that specific competency area. There were three kinds of criteria under the dimension of Culture. They were 'global awareness,' 'intercultural communication,' and 'Chinese culture'. The dimension of Instruction had three kinds of criteria. They were 'instructional perspective,' 'teaching method,' and 'assessment.' There were three kinds of criteria under the dimension of Communication. They were 'oral Chinese,'

'learner's language,' and 'expression ability'. Finally, the criteria of 'Chinese grammar,' 'use of technology', and 'collaborate with colleagues' were categorized under the dimension of Professional Development. Overall, the four dimensions from the literature review were divided into 12 criteria.

The studies being reviewed are also incorporated into the framework of competency for Chinese language teachers, which involves the professional development of teachers in Chinese language education, and responds to this study's specific problems and research questions.

Based on this review, there is a gap between the existing literature and the practices of language teachers for Chinese teaching in Taiwan. The gap exists in the education, recruitment, and professional development for Chinese language teachers in Taiwan. There are different perspectives when it comes to the core competencies for the Chinese language teachers in Taiwan.

A good Chinese teacher can facilitate foreign students and spouses in Chinese language learning. How can we evaluate the Chinese language teacher in Taiwan? There are no universal ideas about the core competencies for the Chinese language teachers in Taiwan.

Yet, what kind of competencies should be considered in the Chinese language teacher's professional training? How can Chinese language teachers be equipped to meet the requirements of Chinese language teacher? What kind of competencies

can be used as the qualifications or standards for a good Chinese language teacher?

For the purpose of improvement for the quality of teachers, these kinds of issues from Taiwan Chinese language teaching are the focus of this study.

Consequently, this study has chosen to fill that gap by answering the following research questions:

What are the most important competency dimensions and criteria for Chinese language teachers, from the four dimensions and 12 criteria? What is the priority order of competencies to be manipulated by developing training courses?

CHAPTER 3: METHODOLOGY

Multiple Criteria Decision Making (MCDM)

MCDM can facilitate researchers in a number of programs, to make sequences and evaluations according to attributes and then select the best program that meets the ideal (Saaty, 2005). It has been utilized in the education field (Tzeng, Chiang, & Li, 2007; Liu, , Tzeng, & Lee, 2012). So this study applied MCDM to research the competencies for Chinese language teachers in Taiwan.

Decision Making Trial and Evaluation Laboratory (DEMATEL)

DEMATEL is a form of MCDM. It can effectively solve complex problems and understand the structure of influence. It considers the interaction between various factors or adjacent levels. It uses 'matrix' to calculate the interaction and influence of various factors, and carries out a comprehensive analysis to derive its mixed weight.

DEMATEL uses the pair-wise comparison way to calculate the level of mutual influences among the criteria and dimension of competency of the Chinese language teachers (Hsu, Wang, & Tzeng, 2012). It helped the researcher to calculate the influence between factors (Yang, Shieh, Leu, & Tzeng, 2008). Existing studies have applied DEMATEL in many academic domains, including: Engineering, Criminal Justice, E-Learning, Business Administration, and so on. The procedure of

DEMATEL can be analyzed as following equations (Tzeng, Chiang, & Li, 2007):

Procedure One: Calculate the average matrix.

$X^k = [x_{ij}^k]$, with $1 \leq k \leq H$

$$a_{ij} = \frac{1}{H} \sum_{k=1}^H x_{ij}^k \quad (1)$$

Procedure Two: Calculate the normalized initial direct influence matrix.

$$\text{Let } s = \max \left(\max_{1 \leq i \leq n} \sum_{j=1}^n a_{ij}, \max_{1 \leq j \leq n} \sum_{i=1}^n a_{ij} \right) \quad (2)$$

$$\text{Then } D = \frac{A}{s} \quad (3)$$

Procedure Three: Calculate the total influence matrix.

$$\begin{aligned} T &= [t_{ij}] \quad i, j = 1, 2, \dots, n \\ \text{where } T &= D + D^2 + \dots + D^m = D + D^2 + \dots + D^m = D(I + D + D^2 + \dots + D^{m-1}) \\ &= D[(I + D + D^2 + \dots + D^{m-1})(1 - D)](1 - D)^{-1} = D(I - D)^{-1}, \quad \text{as } m \rightarrow \infty \quad (4) \end{aligned}$$

The r and c were defined as $n \times 1$ vectors representing the sum of rows and sum of columns of the total relation matrix T as follows (Tzeng, G. H., Chiang, C. H., & Li, C. W., 2007).

$$r = [r_i]_{n \times 1} = \left(\sum_{j=1}^n t_{ij} \right)_{n \times 1} \quad (5)$$

$$c = [c_j]_{1 \times n} = \left(\sum_{i=1}^n t_{ij} \right)'_{1 \times n} \quad (6)$$

The sum of rows and columns gives us an index representing the total effects both given and received by factor. In other words, the rows and columns show the degree of prominence, total sum of effects, given and received. In addition, the rows minus the columns show the net effect. In other words, the rows minus the columns

show the degree of influence, or net value of effects, given and received (Tzeng et al. 2007; Tamura et al., 2002)

Procedure Four: Draw the influence map.

After combining the ‘row+column’ value and the ‘row-column’ value from the factors, we can take the degree of prominence criteria as the horizontal coordinates and the degree of influence as the vertical coordinates, to draw the influence map.

This map is helpful for the interpretation of the analysis results (Yang, Shieh, Leu, & Tzeng, 2008).

According to the equations of DEMATEL introduced in the previous procedure, this study made a sample to explain the calculation method. Figures 4 through 6 and Tables 3 through 6 show the example of procedure for the DEMATEL, which helps to explain the steps for applying the DEMATEL. The letters, from *a* to *d*, represent the criteria in the area. As an instance, the arrow from *a* to *b* indicates the effect *a* has on *b* and the degree of its influence is two. The other letters can be explained in the same way.

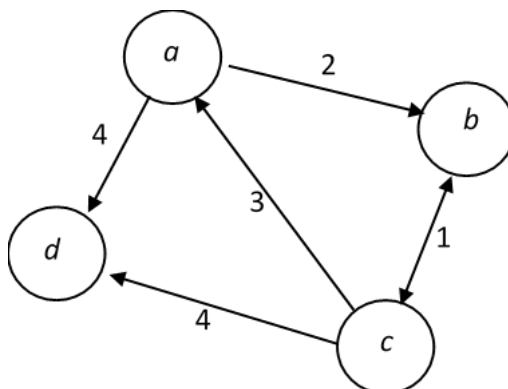


Figure 4: Example of relationship between each factors

We compared the impact of the criteria of a, b, c, and d by the way of ‘pair-wise comparisons’ and followed the direction—0: no influence; 1: weak direct influence; 2: moderate direct influence; 3: strong direct influence; 4: very strong direct influence, to fill out one number in the box of Figure 5.

	a	b	c	d
a		2	0	4
B	0		1	0
C	3	1		4
d	0	0	0	

Row is effects given

Column is effects received

Figure 5: Example of questionnaire for the DEMATEL

- 1) The influence of a on b is moderate direct influence, so 2 is filled out in the box.
- 2) The influence of a on d is very strong direct influence, so 4 is filled out in the box.
- 3) The influence of c on a is strong direct influence, so 3 is filled out in the box.
- 4) The influence of c on b is weak direct influence, so 1 is filled out in the box.
- 5) The influence of c on d is very strong direct influence, so 4 is filled out in the box.
- 6) The influence of d on a, b, and c is no influence, so 0 is filled out in the box.

Table 3: Example of A-matrix

A-matrix	a	b	c	d	Sum
a	0	2	0	4	6
b	0	0	1	0	1
c	3	1	0	4	8
d	0	0	0	0	0
Sum	3	3	1	8 =Max	

In Table 3, the sum of 8 is the maximum value. Then, based on equation. and the values of the average matrix A (Table 3), a direct influence matrix D is obtained and created in Table 4.

Table 4: Example of D-matrix

D-matrix	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
<i>a</i>	0.000	2/8= 0.250	0.000	4/8= 0.500
<i>b</i>	0.000	0.000	1/8= 0.125	0.000
<i>c</i>	3/8= 0.375	1/8= 0.125	0.000	4/8= 0.500
<i>d</i>	0.000	0.000	0.000	0.000

Table 5 presents the total influence T-matrix according to the calculation method introduced in the above research method.

Table 5: Example of T-matrix

T=D*(I-D) ⁻¹ matrix	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	Row
<i>a</i>	0.012	0.257	0.032	0.522	0.823
<i>b</i>	0.048	0.028	0.129	0.088	0.293
<i>c</i>	0.386	0.225	0.028	0.707	1.345
<i>d</i>	0.000	0.000	0.000	0.000	0.000
Column	0.446	0.510	0.189	1.317	

Table 6: Example of Degree of total influence

	Row	Column	Row + Column (degree of prominence)	Row- Column (degree of influence)
<i>a</i>	0.823	0.446	1.269	0.378
<i>b</i>	0.293	0.510	0.803	-0.217
<i>c</i>	1.345	0.189	1.534	1.157
<i>d</i>	0.000	1.317	1.317	-1.317

After combining 'row+column' value & 'row-column' value from the factors, we took the degree of prominence criteria as the horizontal coordinates and the degree of influence as the vertical coordinates, to draw the influence map, as shown in Figure 6.

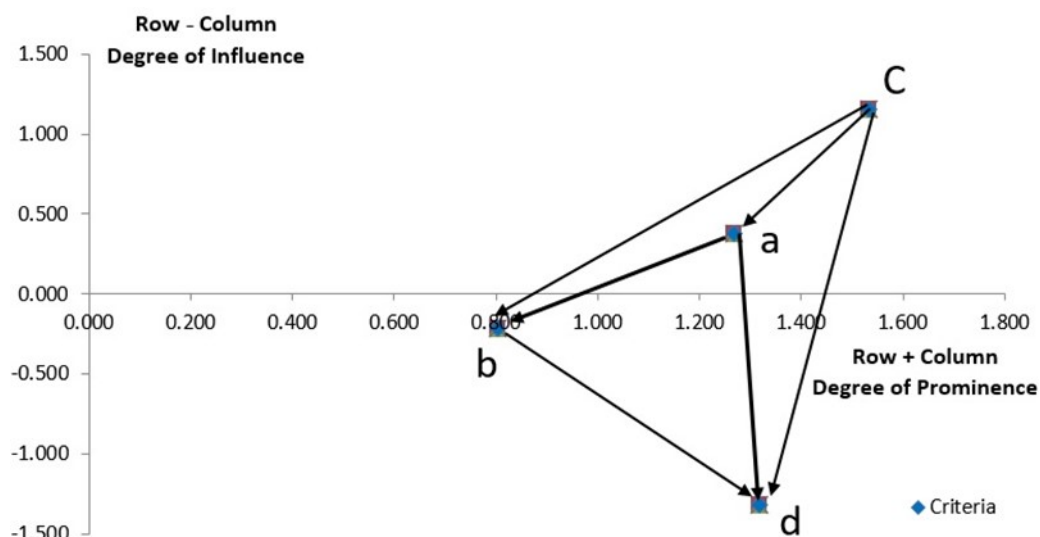


Figure 6: Example of the influence map

From the previous sample, we could find that the DEMATEL helped us confirm the relationship between different factors. DEMATEL helped our understanding of the competencies for Chinese language teachers effectively. Therefore, we made use of 'DEMATEL' to measure the relationship between competencies. The parts of competency of Chinese language teachers in Taiwan are modeled as four dimensions. In this research study, the DEMATEL was applied to evaluate the experts' views about criterion of competency underlying four main dimensions.

Research Design

This research used the DEMATEL to analyze the expert's questionnaire. The

researcher found the key factors for Chinese language teachers in university from Taiwan. Fifteen experts from the Chinese teachers in the department of Chinese language teaching and the center for Chinese language were selected.

A framework of dimensions was composed in the end of literature review. The underlying criteria was established, too. These four dimensions were divided into 12 criteria. The relationship between each dimension and these criteria was shown in Figure 3. Further, the professionals' questionnaire based upon this framework was constructed as the Appendix C.

In the next step, the experts of Chinese language teaching were invited to evaluate the professionals' questionnaires. A total of 15 experts for the Chinese language teaching from the department of Chinese language teaching and the center for Chinese language were selected.

In order to increase the validity of this study, there are three sources of research subjects: 1) senior Chinese language teachers with academic reputations in the Chinese language education domain; 2) Chinese language teachers who serve as the director of a Chinese language teaching center; and 3) Chinese language teachers recommended by the department of Chinese language teaching.

Questionnaires were sent to these Chinese language teachers once they accepted the invitation. The questionnaire was considered valid for pair-wise comparison between each dimension and criteria if the expert followed the instruction

completely inputted all the data.

The questionnaire was explained by the researcher to the experts. In the light of the procedures explained in this chapter, each expert filled in the expert questionnaire by the degree of direct influence between each dimension and criteria.

This study adopted the decision-making instrument to analyze the competency for Chinese language teacher in Taiwan. The questionnaire used the DEMATEL as an analysis tool to analyze each expert's preference from options of questionnaire survey integrated. It can dynamically determine core competency to meet Chinese language teacher's expectation for planning a better learning program.

The equations of DEMATEL utilized the software of statistical calculation (Microsoft Office Excel 2007) for statistical data analysis. The analytical results were used to assess the dimensions and criteria for the competency of Chinese language teacher in Taiwan. In general, this study adopted the DEMATEL questionnaires to continue the survey with experts. Those experts have backgrounds in Chinese language teaching in Taiwan. The research design map is shown in the Figure 6.

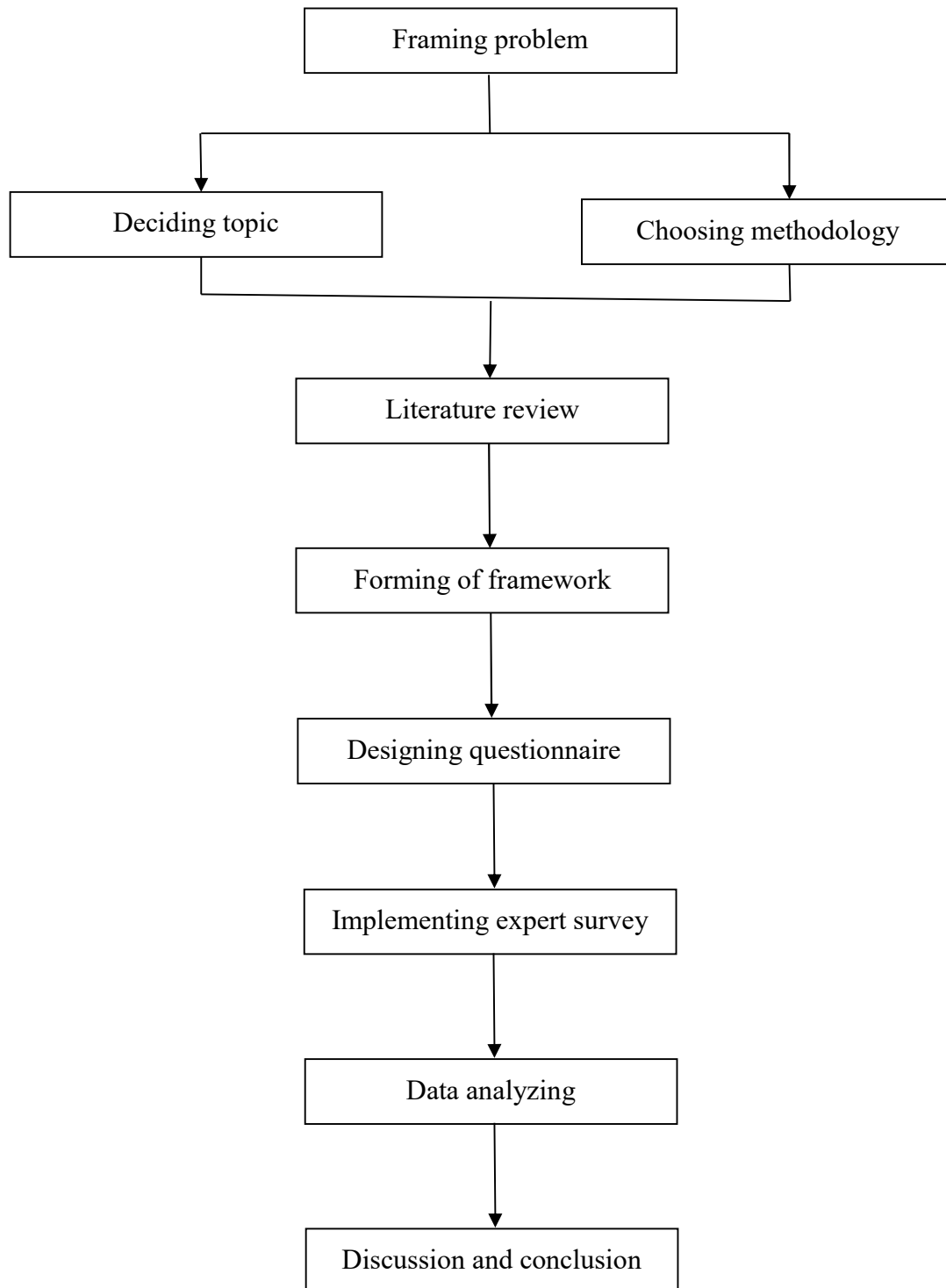


Figure 7: Research design and procedure

CHAPTER 4: RESULTS

The researcher visited 15 experts of Chinese language instruction in person, explained the content of the questionnaire, and requested each expert to complete the questionnaire. Overall, 15 questionnaires were distributed and returned. The valid return rate was 100%. The educational variable showed that the participants with Doctoral degrees was 53%, with Master degree was 20%, with Bachelor degree was 27%. The length in field variable showed that the samples in the field of Chinese language teaching, from 5 to 20 years was 73%, over 20 years was 27%. The 15 experts' details were described as Table 3.

Table 7: The demographic variables of 15 experts

Demographic variables	Number(N = 15)	Percentage
Gender		
Male	1	7
Female	14	93
Age		
51 years old and above	7	46
41~50	4	27
31~40	4	27
Below 30 years old	0	
Educational		
Bachelor	4	27
Master	3	20
Doctoral	8	53
The length in field		
>20	4	27
>5 and <20	11	73
>3 and <5	0	0

Dimensions for the Chinese language teacher competency

After the questionnaires were collected from the experts of Chinese language instruction, according to the calculation methodology introduced in Chapter Three, a simplified normalized total-influence matrix created from the questionnaires of all the experts of Chinese language instruction as well as the degrees of influence and prominence for different dimensions were calculated by matrices (see page 69 to 71, Table 4 to 10).

In the aspect of the four dimensions for Chinese language teacher competency, the sequence in terms of the degree of influence was ‘instruction,’ ‘professional development,’ ‘communication’ and ‘culture.’ The sequence in terms of the degree of prominence was ‘instruction,’ ‘communication,’ ‘professional development’ and ‘culture.’

It also implied that the degree of influence and prominence of the various influence paths of this system in the dimension of ‘instruction’ was the highest. In other words, in general, ‘instruction’ was considered by the experts of Chinese language instruction as the most important factor in the dimension of competency for Chinese language teachers.

The researcher believed that the result of high critical dimension of ‘instruction’ was probably related to the existing instruction situation of Chinese language. This phenomenon reflected that in the practical work of the Chinese

language teachers, the dimension of instruction was situated at the most significant and influential position.

After combining the ‘row+column’ & ‘row-column’ from Table 10, the study took the degree of prominence dimensions as the horizontal coordinates and the degree of influence as the vertical coordinates, to draw an influence map. The mutual-influence relationship among different dimensions was then created in a two-dimensional map, which was helpful for interpretation of the analysis results.

The map being drawn was shown in Figure 7.

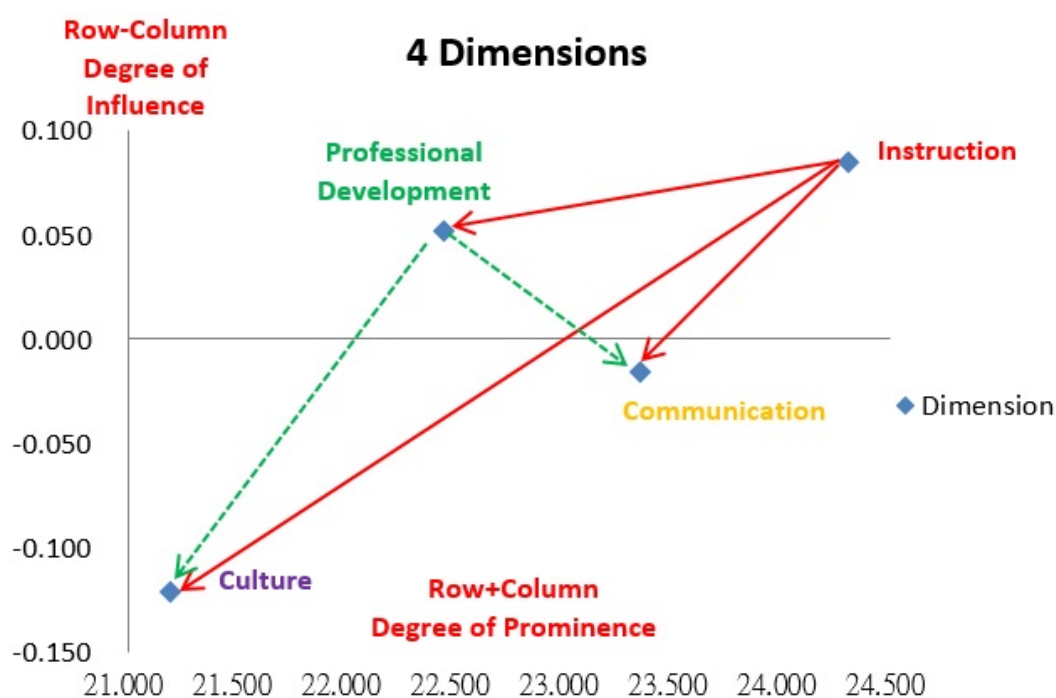


Figure 8: Influence map for four dimensions

Criteria for Chinese language teacher competency

In the aspect of criteria, as known from page 72, Table 11, the overall opinions

of all the experts of Chinese language instruction were shown. The sequence in terms of the degree of influence was ‘instructional perspective,’ ‘teaching method,’ ‘Chinese grammar,’ ‘collaboration with colleagues,’ ‘use of technology,’ ‘oral Chinese,’ ‘intercultural communication,’ ‘learner's language,’ ‘expression ability,’ ‘global awareness,’ ‘Chinese culture’ and ‘assessment.’

It was also known from Table 11 the sequence in terms of the degree of prominence was ‘teaching method,’ ‘instructional perspective,’ ‘expression ability,’ ‘intercultural communication,’ ‘global awareness,’ ‘oral Chinese,’ ‘learner's language,’ ‘collaboration with colleagues,’ ‘assessment,’ ‘Chinese culture,’ ‘Chinese grammar’ and ‘use of technology.’

Table 11 implied that, of the degree of influence of the various influence paths of this system in the criteria, ‘instructional perspective’ was the highest. It also revealed that in the entire system, the total degree of ‘influence’ and ‘being influenced’ produced through ‘instructional perspective’ was very high.

In other words, in general, ‘instructional perspective’ was considered by the experts of Chinese language instruction as the most important factor in the criteria of competency for Chinese language teachers.

Based on the four dimensions of this study, the researcher indicated the mutual influence relationship among different criteria. This study took the degree of influence (row-column value) as the vertical coordinates to draw a map for 12

criteria. The bar graph of 12 criteria was helpful for us to interpret the analysis results for influence of criteria. The map being drawn was shown in Figures 8.

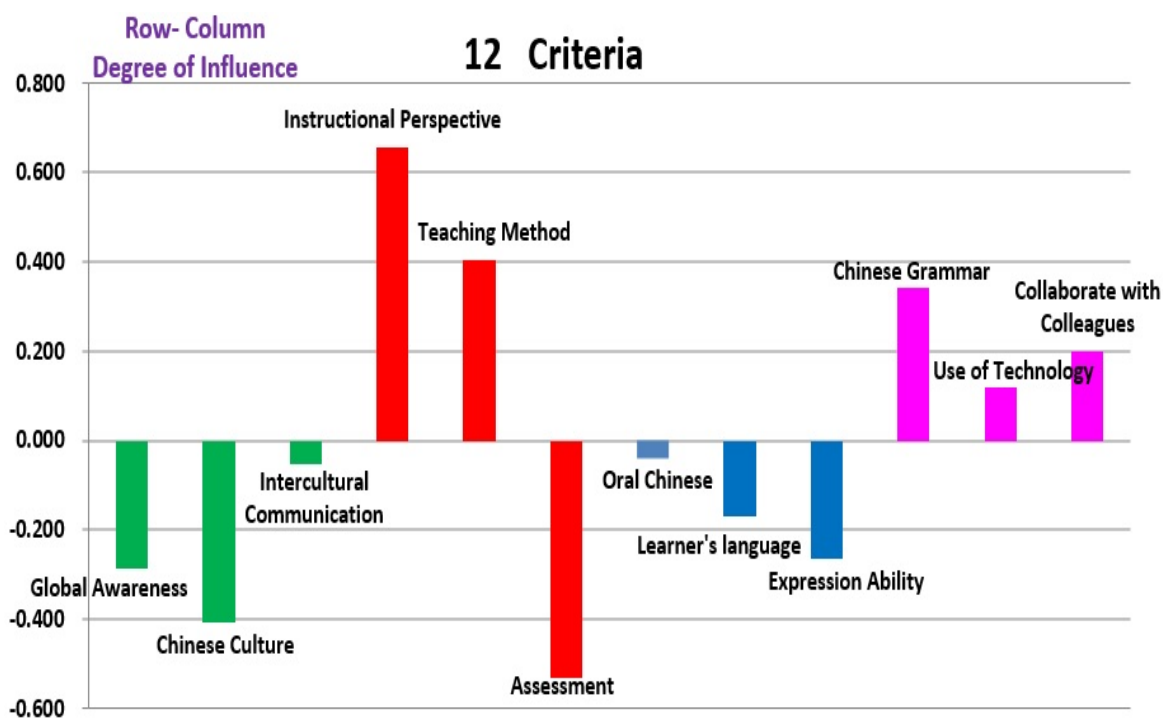


Figure 9: Map for 12 criteria

Criteria for Culture

In the aspect of culture, as known from page 72 to 74, Table 12 to 18, the overall opinions of all the experts of Chinese language instruction were shown. The sequence in terms of the degree of influence was ‘global awareness,’ ‘intercultural communication’ and ‘Chinese culture.’

It was also known from Table 18, the sequence in terms of the degree of prominence was ‘intercultural communication,’ ‘global awareness’ and ‘Chinese culture.’

Table 18 implied that, of the degree of influence of the various influence paths of this system in the criteria, 'global awareness' was the highest. It also revealed that in the entire system, the total degree of 'influence' and 'being influenced' produced through 'global awareness' was very high.

In other words, in general, 'global awareness' was considered by the experts of Chinese language instruction as the most important factor in the culture criteria of competency for Chinese language teachers.

The researcher believed that the result of high critical factor of 'global awareness' was probably related to the existing instruction situation of Chinese language. This phenomenon reflected that in the practical work of the Chinese language teachers, the 'global awareness' was situated at the influential position.

Furthermore, the result that 'intercultural communication' also had quite a high degree of critical factor was probably related to the Chinese language teachers' needs of self-development and in-service training.

Criteria for Instruction

In the aspect of instruction, as known from page 75 to 77, Table 19 to 25, the overall opinions of all the experts of Chinese language instruction were shown. The sequence in terms of the degree of influence was 'instructional perspective,' 'teaching method' and 'assessment.' It was also known from Table 25, the sequence

in terms of the degree of prominence was ‘teaching method’, ‘instructional perspective’ and ‘assessment’.

Table 25 revealed that, in the degree of influence of the various influence paths of this system in the criteria, ‘instructional perspective’ was the highest. It also implied that in the entire system, the total degree of ‘influence’ and ‘being influenced’ produced through ‘instructional perspective’ was very high.

In other words, in general, ‘instructional perspective’ was considered by the experts of Chinese language instruction as the most important factor in the instruction criteria of competency for Chinese language teachers.

The researcher believed that the result of high critical factor of ‘instructional perspective’ was probably related to the existing instruction situation of Chinese language. This phenomenon reflected that in the practical work of the Chinese language teachers, the ‘instructional perspective’ was situated at influential position.

Besides, the result that ‘teaching method’ also had quite a high degree of critical factor is probably related to the Chinese language teachers’ needs of self-development and in-service training.

Criteria for Communication

In the aspect of communication, as known from page 77 to 79, Table 26 to 32,

the overall opinions of all the experts of Chinese language instruction were shown.

The sequence in terms of the degree of influence was ‘oral Chinese,’ ‘learner's language’ and ‘expression ability.’ It was also known from Table 32, the sequence in terms of the degree of prominence was ‘expression ability,’ ‘oral Chinese’ and ‘learner's language.’

Table 32 revealed that, in the degree of influence of the various influence paths of this system in the criteria, ‘oral Chinese’ was the highest. It also implied that in the entire system, the total degree of ‘influence’ and ‘being influenced’ produced through ‘oral Chinese’ was very high.

In other words, in general, ‘oral Chinese’ was considered by the experts of Chinese language instruction as the most important factor in the culture criteria of competency for Chinese language teachers.

The researcher believed that the result of high critical factor of ‘oral Chinese’ was probably related to the existing instruction situation of Chinese language. This phenomenon reflected that in the practical work of the Chinese language teachers, the ‘oral Chinese’ was situated at the influential position.

Moreover, the result that ‘learner's language’ also had quite a high degree of critical factor was probably related to the Chinese language teachers’ needs of self-development and in-service training.

Criteria for Professional Development

In the aspect of professional development, as known from page 80 to 82, Table 33 to 39, the overall opinions of all the experts of Chinese language instruction were shown. The sequence in terms of the degree of influence was ‘collaborate with colleagues,’ ‘Chinese grammar’ and ‘use of technology.’

It is also known from Table 39, the sequence in terms of the degree of prominence was ‘use of technology,’ ‘collaborate with colleagues’ and ‘Chinese grammar.’

Table 39 revealed that, in the degree of influence of the various influence paths of this system in the criteria, ‘collaborate with colleagues’ is the highest. It also implied that in the entire system, the total degree of ‘influence’ and ‘being influenced’ produced through ‘collaborate with colleagues’ was very high.

In other words, in general, ‘collaborate with colleagues’ was considered by the experts as a most important factor in the culture criteria of competency for Chinese language teachers.

The researcher believed that the result of high critical factor of ‘collaborate with colleagues’ was probably related to the existing instruction situation of Chinese language.

This phenomenon reflected that in the practical work of the Chinese language teachers, the ‘collaborate with colleagues’ was situated at the influential position.

Moreover, the result that ‘Chinese grammar’ also had quite a high degree of critical factor was probably related to the Chinese language teachers’ needs of self-development and in-service training.

Summary

In the aspect of dimensions for Chinese language teacher competency, the sequence in terms of the degree of influence was ‘instruction,’ ‘professional development,’ ‘communication’ and ‘culture.’ The sequence in terms of the degree of prominence was ‘instruction,’ ‘communication,’ ‘professional development’ and ‘culture.’ ‘Instruction’ was considered as the most important factor in the dimension of competency for Chinese language teachers.

In the aspect of criteria for Chinese language teacher competency, the sequence in terms of the degree of influence was ‘instructional perspective,’ ‘teaching method,’ ‘Chinese grammar,’ ‘collaboration with colleagues,’ ‘use of technology,’ ‘oral Chinese,’ ‘intercultural communication,’ ‘learner's language,’ ‘expression ability,’ ‘global awareness,’ ‘Chinese culture’ and ‘assessment.’

The sequence in terms of the degree of prominence was ‘teaching method,’ ‘instructional perspective,’ ‘expression ability,’ ‘intercultural communication,’ ‘global awareness,’ ‘oral Chinese,’ ‘learner's language,’ ‘collaboration with colleagues,’ ‘assessment,’ ‘Chinese culture,’ ‘Chinese grammar’ and ‘use of technology.’

Since the degree of influence of ‘instructional perspective’ was the highest and the degree of prominence was very high, the ‘instructional perspective’ was considered by the experts of Chinese language instruction as the most important

factor in the criterion of competency for Chinese language teachers.

In the aspect of culture, the sequence in terms of the degree of influence was ‘global awareness,’ ‘intercultural communication’ and ‘Chinese culture.’ The sequence in terms of the degree of prominence was ‘intercultural communication,’ ‘global awareness’ and ‘Chinese culture.’

The results showed that the degree of influence for ‘global awareness’ was the highest, and the degree of prominence for ‘global awareness’ was very high. So the ‘global awareness’ was considered by the experts of Chinese language instruction as the most important factor in the culture criteria of competency for Chinese language teachers.

In the aspect of instruction, the sequence in terms of the degree of influence was ‘instructional perspective,’ ‘teaching method’ and ‘assessment.’ The sequence in terms of the degree of prominence was ‘teaching method,’ ‘instructional perspective’ and ‘assessment’.

It revealed that the degree of influence for ‘instructional perspective’ was the highest. It also implied that the degree of prominence for ‘instructional perspective’ was very high. So the ‘instructional perspective’ was considered as the most important factor in the instruction criteria.

In the aspect of communication,’ the sequence in terms of the degree of influence was ‘oral Chinese,’ ‘learner's language’ and ‘expression ability.’ The

sequence in terms of the degree of prominence was ‘expression ability,’ ‘oral Chinese’ and ‘learner's language.’

The results revealed that the degree of influence for ‘oral Chinese’ was the highest. It also implied that in the degree of prominence for ‘oral Chinese’ was very high. Therefore, the ‘oral Chinese’ was considered as the most important factor in the communication criteria.

In the aspect of professional development, the sequence in terms of the degree of influence was ‘collaborate with colleagues,’ ‘Chinese grammar’ and ‘use of technology.’ The sequence in terms of the degree of prominence was ‘use of technology,’ ‘collaborate with colleagues’ and ‘Chinese grammar.’

It revealed that the degree of influence for ‘collaborate with colleagues’ was the highest. It also implied that the degree of prominence for ‘collaborate with colleagues’ was very high. So the ‘collaborate with colleagues’ was considered by experts as the most important factor in the professional development dimension.

The study also took the degree of prominence criteria as the horizontal coordinates and the degree of influence as the vertical coordinates, to draw an influence map. The mutual-influence relationship among different dimension was then created in a two-dimensional map, which was helpful for interpretation of the analysis results.

CHAPTER 5: CONCLUSION

Discussions of the Findings

This study found that the competencies for Chinese language teachers were categorized into four dimensions: Culture, Instruction, Communication, and Professional Development. Each competency dimension was a broad topic area that was essential for caring for and educating Chinese language learners.

Furthermore, each dimension had multiple criteria, which describe what a Chinese language teacher should know and demonstrate to that specific competency area. There were three kinds of criteria under the dimension of Culture. They were ‘global awareness,’ ‘intercultural communication,’ and ‘Chinese culture’. The dimension of Instruction had three kinds of criteria. They were ‘instructional perspective,’ ‘teaching method,’ and ‘assessment.’ There were three kinds of criteria under the dimension of Communication. They were ‘oral Chinese,’ ‘learner's language,’ and ‘expression ability’. Finally, the criteria of ‘Chinese grammar,’ ‘use of technology’, and ‘collaborate with colleagues’ were categorized under the dimension of Professional Development. Overall, the four dimensions from the literature review were divided into 12 criteria.

This study also invented the ‘Competency Framework for Chinese Language teacher’, which helps the teacher’s professional development of Chinese language

education, and responded to the research questions.

This study found that there was a gap between the existing research results and the practice of language teachers who teach Chinese language in Taiwan. The gap existed in the education, recruitment, and professional development for Chinese language teachers in Taiwan. Especially on the core competencies for Chinese language teachers, there existed different points of view among different scholars in Taiwan. Therefore, this study filled that gap by researching the following target : 1) The most important competency dimensions and criteria for Chinese language teachers, from the four dimensions and 12 criteria. 2) The priority order of competencies to be manipulated by developing training courses.

Based on Chinese language teaching experts' points of view, this study applied the approach of DEMATEL, a form of MCDM, to analyze the critical competencies for Chinese language teaching in Taiwan. It can effectively solve complex problems of Chinese language teaching and understand the structure of influence. The major findings of this study were discussed as following.

In the aspect of four dimensions for Chinese language teacher competency, the sequence in terms of the degree of influence was 'instruction,' 'professional development,' 'communication' and 'culture.' In general, the 'instruction' was considered by the experts of Chinese language instruction as a most important factor in the dimension of competency for Chinese language teachers.

In the aspect of 12 criteria for Chinese language teacher competency, the sequence in terms of the degree of influence was ‘instructional perspective,’ ‘teaching method,’ ‘Chinese grammar,’ ‘collaboration with colleagues,’ ‘use of technology,’ ‘oral Chinese,’ ‘intercultural communication,’ ‘learner's language,’ ‘expression ability,’ ‘global awareness,’ ‘Chinese culture’ and ‘assessment’. In general, the ‘instructional perspective’ was considered by the experts of Chinese language instruction as a most important factor in the criterion of competency for Chinese language teachers.

The researcher took the degree of prominence (‘row+column’ from the dimensions & criteria) as the horizontal coordinates and the degree of influence (‘row-column’ from the dimensions & criteria) as the vertical coordinates, to draw a map of influence. The mutual-influence relationship among different dimensions and criteria were created in a two-dimensional map, which were helpful for interpretation of the analysis results.

Implications of the Research

A good Chinese language teacher can facilitate foreign students and spouses in Chinese language learning. For the purpose of improvement for the quality of Chinese language teachers, this research studied the competencies of Chinese language teacher. They can be used as the qualifications or standards for a good

Chinese language teacher in Taiwan.

According to the results of this research, the sequence in terms of the dimensions for Chinese language teacher competency is 'instruction,' 'professional development,' 'communication' and 'culture.' The sequence in terms of the degree of criteria for Chinese language teacher competency is 'instructional perspective,' 'teaching method,' 'Chinese grammar,' 'collaboration with colleagues,' 'use of technology,' 'oral Chinese,' 'intercultural communication,' 'learner's language,' 'expression ability,' 'global awareness,' 'Chinese culture' and 'assessment.' From these findings, this research provides suggestions for the sequence in terms of corresponding training courses.

The research subjects of this study were from three sources of: 1) senior Chinese language teachers with academic reputations in the Chinese language education domain; 2) Chinese language teachers who serve as the director of a Chinese language teaching center; and 3) Chinese language teachers recommended by the department of Chinese language teaching. The experts of Chinese language instruction gave the researcher reasonable reason to believe that the results of this research were probably related to the existing instruction situation of Chinese language. This phenomenon reflected that in the practical work of the Chinese language teachers, the dimension of instruction was situated at the most significant and influential position. Besides, the result also had quite a high degree of critical

dimension and criteria were probably related to the Chinese language teachers' needs of self-development and in-service training.

Therefore, this study provided the findings for the Taiwan government to promote Chinese language teaching. The sequence in terms of dimensions and criteria for Chinese language teacher competencies helped the government to design Chinese language teacher's professional training and equip students to meet the requirements of Chinese language teacher. This study also indicated that the instructional perspective was very important criterion in Chinese language teacher learning to teach. In the aspect of universities' Chinese language teacher education, departments of Chinese language teaching should develop courses of instructional perspective. Doing so can help student teachers understand the knowledge of Chinese language teaching, and connect to Chinese language practical teaching.

After all, the findings of this study can be used to improve the quality of Chinese language teachers in many ways. The findings can be applied by the related authorities of Chinese language teaching to make policy formulation, the curriculum design of the department of Chinese language teaching in university, the recruitment standard of Chinese language centers, on-the-job training, and the improvement of Chinese language teachers' self-ability.

In academic research and in research methods, DEMATEL used in this study to provide another research approach and thinking orientation for future research on

adult education. Since the DEMATEL use the small expert's samples, it will save lot of resources; it will be an another choice method for researcher to apply in the adult learning setting.

Recommendations for Future Research

Considering there were some limitations of this study, the researcher made some recommendations for future research. One was that the teacher competency framework, organized by this study, was based on some Chinese language teaching documents in a convenience collection. It was suggested that future research collect different indicators from literature, then integrate and modify the framework. The second limitation was the location, which was limited to Northern Taiwan as the sample for the study, not the entire country. This study suggested that future research can expand the location of the sample to all of Taiwan. The third limitation was this study focused on the 'university level' Chinese language teacher, not teachers in general. If future researchers do this kind of research, the researcher suggests that the Chinese language teachers are not limited to the university level.

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APPENDICES

Appendix A: Institutional Review Board Approval



Office of Research Administration

One University Boulevard
St. Louis, Missouri 63121-4499
Telephone: 314-516-5899
Fax: 314-516-6759
E-mail: ora@umsl.edu

DATE: December 10, 2017

TO: Yinghua Lan, Doctoral of Education
FROM: University of Missouri-St. Louis IRB

PROJECT TITLE: [1021337-1] The core competency for Chinese language teacher in Taiwan: A Multi-Criteria Decision Making approach

REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: APPROVED
APPROVAL DATE: December 10, 2017
EXPIRATION DATE: December 10, 2018
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # 7

The chairperson of the University of Missouri-St. Louis IRB has reviewed the above mentioned protocol for research involving human subjects and determined that the project qualifies for expedited review under Title 45 Code of Federal Regulations Part 46.110b. The time period for this approval expires one year from the date listed below. You must notify the University of Missouri-St. Louis IRB in advance of any proposed major changes in your approved protocol, e.g., addition of research sites or research instruments.

You must file an annual report with the committee. This report must indicate the starting date of the project and the number of subjects to date from start of project, or since last annual report, whichever is more recent.

Any consent or assent forms must be signed in duplicate and a copy provided to the subject. The principal investigator must retain the other copy of the signed consent form for at least three years following the completion of the research activity and they must be available for inspection if there is an official review of the UM-St. Louis human subjects research proceedings by the U.S. Department of Health and Human Services Office for Protection from Research Risks.

This action is officially recorded in the minutes of the committee.

If you have any questions, please contact Carl Bassi at 314-516-6029 or bassi@umsl.edu. Please include your project title and reference number in all correspondence with this committee.

Appendix B: Informed Consent for Participation in Research Activities**Department of Education Sciences and Professional Programs**

One University Blvd.
 201 Education Admin Bldg
 201 St. Louis, Missouri 63121-4400
 Telephone: 314-516-4970
 Fax: 314-516-5953
 E-mail: ylc4c@umsl.edu

Informed Consent for Participation in Research Activities
 The core competency for Chinese language teacher in Taiwan:
 A Multi-Criteria Decision Making approach

Participant _____

HSC Approval Number _____

Principal Investigator Ying-hua Lan _____PI's Phone Number 0916401915 _____

1. You are invited to participate in a research study conducted by Ying-hua Lan and Dr. Davis, Matthew D.. The purpose of this research is to find the competencies, which are the most important factors for Chinese language teacher education, practice teaching and development in Taiwan.
2. Your participation will involve to help this study understand the relative importance of each criteria. You will be asked to fill in the MCDM questionnaire. You will propose the degree of direct influence that each criterion (sub-sector) i exerts on each criterion j , which is denoted by d_{ij} , using the assumed scales. Approximately 15 experts for Chinese language teaching may be involved in this research. The amount of time involved in your participation will be 30 minutes.
3. There are no anticipated risks associated with this research.
4. There are no direct benefits for you participating in this study. However, your participation will contribute to the knowledge about Chinese language teaching and may help society.
5. Your participation is voluntary and you may choose not to participate in this research study or to withdraw your consent at any time. If you want to withdraw from the study, you can contact me at: Ying-hua Lan Phone Number 0916401915 or email una228@mail.cpu.edu.tw. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.
6. By agreeing to participate, you understand and agree that your data may be shared with other researchers and educators in the form of presentations and/or publications. In all cases, your identity will not be revealed. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection). That agency would be required to maintain the confidentiality of your data. In addition, all data will be stored on a password-protected computer and/or in a locked office.
7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Ying-hua Lan 0916401915 or the Faculty Advisor, Dr. Davis, Matthew D. 516-5953. You may

The core competency for Chinese language teacher in Taiwan: A Multi-Criteria Decision Making approach

also ask questions or state concerns regarding your rights as a research participant to the Office of Research Administration, at 516-5897.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my participation in the research described above.

Participant's Signature

Date

Participant's Printed Name

Signature of Investigator or Designee

Date

Investigator/Designee Printed Name

Appendix C: Questionnaire for the expert

Information Sheet

Dear expert,

You are invited to participate in a research study conducted by Ying-hua Lan and Matthew D. Davis, Ph.D. The purpose of this research aims to investigate the core competency for Chinese language teacher in Taiwan. Your participation will involve filling out the expert's questionnaire to find the key factors on the teaching of Chinese. Your participation is voluntary and you may choose not to participate in this research study at any time. You may choose not to answer any questions that you do not want to answer. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Ying-hua Lan 00886-916-401-915 or the Faculty Advisor, Matthew D. Davis, Ph.D (314) 516-5953. You may also ask questions or state concerns regarding your rights as a research participant to the Office of Research Administration, at (314) 516-5897.

The questionnaire of this research is divided into five parts: I . Example of questionnaire; II . Description of key factors III . Comparison of the impact of the five dimensions; IV . Comparison of the impact of the criteria; V . Personal profiles of sourced experts.

Please compare the impact of the dimensions and criteria by the way of ‘pair-wise comparisons’ and follow the direction of example to fill out one number in the box, from 0 to 4.

I . Example of questionnaire

- 1) The influence of communication on culture is weak; therefore, 1 is filled out in the box.
- 2) The influence of instruction on communication is very strong; therefore, 4 is filled out in the box.

Pair-wise Comparisons	Culture	Instruction	Communication
Culture			↑
Instruction	←		→ 4
Communication	→ 1		

Note: 0: no influence; 1: weak direct influence; 2: moderate direct influence; 3: strong direct influence; 4: very strong direct influence.

II. Description of key factors

Dimensions	Criteria	Description
Culture	Global Awareness	Global awareness is in close touch with language learning and culture.
	Intercultural Communication	The issue of cultural competency is often emerging under the process of intercultural communication.
	Chinese culture	Chinese culture is internalized, accumulated, and permeated in the psychological depth of each generation of Chinese community
Instruction	Instructional Perspective	The instructional perspective of the members. Teacher has an important effect on adult satisfaction with learning.
	Assessment	Assessing learner needs, monitoring progress, and providing feedback are essential components of the instructional process.
	Teaching Method	The teaching methods adopted by teachers to complete teaching tasks, and to guide students in their learning.
Communication	Oral Chinese	Teacher's correct voice demonstration is significant to avoid mixing disturbance.
	Learner's language	Scholars believe that some of language teachers' self-confidence comes from their ability to use the learner's language.
	Expression Ability	The teacher's expression ability can help student to understand the content of course.
Professional Development	Chinese Grammar	Chinese usage laws and regulations refer to the complete organization of words and phrases, short sentences and sentences and the rational organization of articles.
	Use of Technology	The use of technology in Chinese Language teaching becomes more important in present times.
	Collaborate with Colleagues	The ability to collaborate and communicate effectively with administrators and instructional colleagues, and community members is important.

Note: These criteria and relevant data were sourced from literature and organized by this study.

III. Comparison of the impact of the dimensions

Please compare the impact of the dimensions by the way of 'pair-wise comparisons' and follow the direction of example to fill out one number in the box, from 0 to 4.

Pair-wise Comparisons	Culture	Instruction	Communication	Professional Development
Culture				
Instruction				
Communication				
Professional Development				

Note: 0: no influence; 1: weak direct influence; 2: moderate direct influence; 3: strong direct influence; 4: very strong direct influence.

IV. Comparison of the impact of the criteria

Please compare the impact of the criteria by the way of ‘pair-wise comparisons’ and follow the direction of example to fill out one number in the box, from 0 to 4.

Pair-wise Comparisons	C-1	C-2	C-3	C-4	C-5	C-6	C-7	C-8	C-9	C-10	C-11	C-12
C-1												
C-2												
C-3												
C-4												
C-5												
C-6												
C-7												
C-8												
C-9												
C-10												
C-11												
C-12												

Symbols being used for representing the Criteria

Symbol	Criteria
C-1	Global Awareness
C-2	Chinese Culture
C-3	Intercultural Communication
C-4	Instructional Perspective
C-5	Teaching Method
C-6	Assessment
C-7	Oral Chinese
C-8	Learner's language
C-9	Expression Ability
C-10	Chinese Grammar
C-11	Use of Technology
C-12	Collaborate with Colleagues

Note: 0: no influence; 1: weak direct influence; 2: moderate direct influence; 3: strong direct influence; 4: very strong direct influence.

V. Personal profiles of sourced experts.

1. Gender: Male Female

2. Age:

3. Educational background: Bachelors Master Doctorate

4. Seniority: Less than 5 years 5-10 years 10- 15 years 15- 20 years
 Over 20 years

5. Work experience:

6. Current Title: Teacher Lecturer Assistant Professor Associate Professor
Professor
Director Chair Others

☆ Here is the end of this questionnaire. Thank you for your participation!

Appendix D: Calculation process for results

I . Dimensions

Table 8: Initial average matrix A for 4 Dimensions of Chinese language teacher

A-matrix	Culture	Instruction	Communication	Professional Development	Sum
Culture	0.000	2.933	2.867	2.133	7.933
Instruction	2.733	0.000	3.400	3.467	9.600
Communication	2.933	3.200	0.000	2.933	9.067
Professional Development	2.400	3.400	2.800	0.000	8.600
Sum	8.067	9.533	9.067	8.533	

In Table 4, the sum of the third row is the maximum value (9.600). Then, based on equation and the values of the average matrix A (Table 4), a direct influence matrix D is obtained and created in Table 5.

Table 9: Direct influence matrix D for four Dimensions of Chinese language teacher

D-matrix	Culture	Instruction	Communication	Professional Development
Culture	0.000	0.306	0.299	0.222
Instruction	0.285	0.000	0.354	0.361
Communication	0.306	0.333	0.000	0.306
Professional Development	0.250	0.354	0.292	0.000

As Table 6 minus Table 5, the Indirect influence matrix I-D for four Dimensions of Chinese language teacher is obtained and created in Table 7.

Table 10: I -matrix for four Dimensions of Chinese language teacher

I -matrix	Culture	Instruction	Communication	Professional Development
Culture	1	0	0	0
Instruction	0	1	0	0
Communication	0	0	1	0
Professional Development	0	0	0	1

Table 11: Indirect influence matrix I-D for four Dimensions

I-D matrix	Culture	Instruction	Communication	Professional Development
Culture	1.000	-0.306	-0.299	-0.222
Instruction	-0.285	1.000	-0.354	-0.361
Communication	-0.306	-0.333	1.000	-0.306
Professional Development	-0.250	-0.354	-0.292	1.000

Table 12: I/(I-D) matrix for four Dimensions of Chinese language teacher

I/(I-D) matrix	Culture	Instruction	Communication	Professional Development
Culture	3.310	2.857	2.762	2.611
Instruction	2.893	4.037	3.191	3.076
Communication	2.790	3.155	3.803	2.921
Professional Development	2.666	3.064	2.930	3.594

Table 9 presents the total influence matrix according to the calculation way

introduced in the above research method.

Table 13: Total influence matrix T for four Dimensions

T=D*(I-D)-1 matrix	Culture	Instruction	Communication	Professional Development	r
Culture	2.310	2.857	2.762	2.611	10.539
Instruction	2.893	3.037	3.191	3.076	12.197
Communication	2.790	3.155	2.803	2.921	11.669
Professional Development	2.666	3.064	2.930	2.594	11.254
c	10.660	12.112	11.685	11.202	

Table 14: Degree of total influence for four Dimensions

Dimensions	r	c	row+column	Rank	row-column	Rank
Culture	10.539	10.660	21.198	4	-0.121	4
Instruction	12.197	12.112	24.310	1	0.085	1
Communication	11.669	11.685	23.354	2	-0.016	3
Professional Development	11.254	11.202	22.456	3	0.052	2

II. Total 12 Criteria

Table 15: Degree of total influence for 12 Criteria

	Criteria	r	c	row+column	Rank	row-column	Rank
1	Global Awareness	3.572	3.859	7.431	4	-0.287	10
2	Chinese Culture	3.259	3.667	6.926	8	-0.408	11
3	Intercultural Communication	3.985	4.039	8.024	9	-0.054	7
4	Instructional Perspective	4.583	3.926	8.508	2	0.657	1
5	Teaching Method	4.685	4.280	8.965	1	0.405	2
6	Assessment	3.220	3.751	6.971	10	-0.532	12
7	Oral Chinese	3.688	3.692	7.380	5	-0.003	6
8	Learner's language	3.539	3.709	7.248	6	-0.170	8
9	Expression Ability	3.942	4.208	8.151	3	-0.266	9
10	Chinese Grammar	3.602	3.260	6.862	11	0.341	3
11	Use of Technology	3.314	3.196	6.510	12	0.119	5
12	Collaborate with Colleagues	3.594	3.395	6.989	7	0.199	4

III. Criteria for Culture

Table 16: Initial average matrix A for three criteria of culture

A-matrix	Global Awareness	Chinese Culture	Intercultural Communication	Sum
Global Awareness	0.000	2.733	3.467	6.200
Chinese Culture	2.667	0.000	3.133	5.800
Intercultural Communication	3.467	3.200	0.000	6.667
Sum	6.133	5.933	6.600	

In Table 12, the sum of the fourth row is the maximum value (6.667). Then,

based on equation and the values of the average matrix A (Table 12), a direct influence matrix D is obtained and created in Table 13.

Table 17: Direct influence matrix D for three criteria of culture

D-matrix	Global Awareness	Chinese Culture	Intercultural Communication
Global Awareness	0.000	0.410	0.520
Chinese Culture	0.400	0.000	0.470
Intercultural Communication	0.520	0.480	0.000

As Table 14 minus Table 13, the Indirect influence matrix I-D for three criteria of culture is obtained and created in Table 15.

Table 18: I-matrix for three criteria of culture

I matrix	Global Awareness	Chinese Culture	Intercultural Communication
Global Awareness	1	0	0
Chinese Culture	0	1	0
Intercultural Communication	0	0	1

Table 19: Indirect influence matrix I-D for three criteria of culture

I-D matrix	Global Awareness	Chinese Culture	Intercultural Communication
Global Awareness	1.000	-0.410	-0.520
Chinese Culture	-0.400	1.000	-0.470
Intercultural Communication	-0.520	-0.480	1.000

Table 20: I/(I-D) matrix for three criteria of culture

I/(I-D) matrix	Global Awareness	Chinese Culture	Intercultural Communication
Global Awareness	5.533	4.713	5.092
Chinese Culture	4.604	5.213	4.844
Intercultural Communication	5.087	4.953	5.973

Table 17 presents the total influence matrix according to the calculation method introduced in the above research method.

Table 21: Total influence matrix T for three criteria of culture

T=D*(I-D)-1 matrix	Global Awareness	Chinese Culture	Intercultural Communication	r
Global Awareness	4.533	4.713	5.092	14.338
Chinese Culture	4.604	4.213	4.844	13.662
Intercultural Communication	5.087	4.953	4.973	15.014
c	14.225	13.879	14.910	

Table 22 Degree of total influence for three criteria of culture

Criteria	r	c	row+column	Rank	row-column	Rank
Global Awareness	14.338	14.225	28.563	2	0.114	1
Chinese Culture	13.662	13.879	27.541	3	-0.217	3
Intercultural Communication	15.014	14.910	29.924	1	0.104	2

IV. Criteria for Instruction

Table 23: Initial average matrix A for three criteria of instruction

A-matrix	Instructional Perspective	Teaching Method	Assessment	Sum
Instructional Perspective	0.000	3.533	3.267	6.800
Teaching Method	3.533	0.000	3.267	6.800
Assessment	2.667	2.867	0.000	5.533
Sum	6.200	6.400	6.533	

In Table 19, the sum of the second & third row is the maximum value (6.800).

Then, based on equation and the values of the average matrix A (Table 19), a direct influence matrix D is obtained and created in Table 20.

Table 24: Direct influence matrix D for three criteria of instruction

D-matrix	Instructional Perspective	Teaching Method	Assessment
Instructional Perspective	0.000	0.520	0.480
Teaching Method	0.520	0.000	0.480
Assessment	0.392	0.422	0.000

Table 25 I matrix for three criteria of instruction

I matrix	Instructional Perspective	Teaching Method	Assessment
Instructional Perspective	1	0	0
Teaching Method	0	1	0
Assessment	0	0	1

As Table 21 minus Table 20, the Indirect influence matrix I-D for three criteria of instruction is obtained and created in Table 22.

Table 26: Indirect influence matrix I-D for three criteria of instruction

I-D matrix	Instructional Perspective	Teaching Method	Assessment
Instructional Perspective	1.000	-0.520	-0.480
Teaching Method	-0.520	1.000	-0.480
Assessment	-0.392	-0.422	1.000

Table 27: I/(I-D) matrix for three criteria of instruction

I/(I-D) matrix	Instructional Perspective	Teaching Method	Assessment
Instructional Perspective	5.865	5.310	5.368
Teaching Method	5.207	5.969	5.368
Assessment	4.495	4.599	5.368

Table 24 presents the total influence matrix according to the calculation way introduced in the above research method.

Table 28: Total influence matrix T for three criteria of instruction

T=D*(I-D)-1 matrix	Instructional Perspective	Teaching Method	Assessment	r
Instructional Perspective	4.865	5.310	5.368	15.544
Teaching Method	5.207	4.969	5.368	15.544
Assessment	4.495	4.599	4.368	13.462
c	14.566	14.878	15.105	

Table 29: Degree of total influence for three criteria of instruction

Criteria	r	c	row+column	Rank	row-column	Rank
Instructional Perspective	15.544	14.566	30.109	2	0.978	1
Teaching Method	15.544	14.878	30.421	1	0.666	2
Assessment	13.462	15.105	28.567	3	-1.643	3

V. Criteria for Communication

Table 30: Initial average matrix A for three criteria of communication

A-matrix	Oral Chinese	Learner's language	Expression Ability	Sum
Oral Chinese	0.000	2.400	3.467	5.867
Learner's language	2.533	0.000	2.867	5.400
Expression Ability	2.800	2.800	0.000	5.600
Sum	5.333	5.200	6.333	

In Table 26, the sum of the fourth column is the maximum value (6.333).

Then, based on equation and the values of the average matrix A (Table 26), a direct influence matrix D is obtained and created in Table 27.

Table 31: Direct influence matrix D for three criteria of communication

D-matrix	Oral Chinese	Learner's language	Expression Ability
Oral Chinese	0.000	0.379	0.547
Learner's language	0.400	0.000	0.453
Expression Ability	0.442	0.442	0.000

As Table 28 minus Table 27, the Indirect influence matrix I-D for three criteria of communication is obtained and created in Table 29.

Table 32: I -matrix for three criteria of communication

I matrix	Oral Chinese	Learner's language	Expression Ability
Oral Chinese	1	0	0
Learner's language	0	1	0
Expression Ability	0	0	1

Table 33: Indirect influence matrix I-D for three criteria of communication

I-D matrix	Oral Chinese	Learner's language	Expression Ability
Oral Chinese	1.000	-0.379	-0.547
Learner's language	-0.400	1.000	-0.453
Expression Ability	-0.442	-0.442	1.000

Table 34: I/(I-D) matrix for three criteria of communication

I/(I-D) matrix	Oral Chinese	Learner's language	Expression Ability
Oral Chinese	3.423	2.657	3.076
Learner's language	2.568	3.244	2.874
Expression Ability	2.649	2.609	3.631

Table 31 presents the total influence matrix according to the calculation method introduced in the above research method.

Table 35: Total influence matrix T for three criteria of communication

T=D*(I-D)-1 matrix	Oral Chinese	Learner's language	Expression Ability	r
Oral Chinese	2.423	2.657	3.076	8.156
Learner's language	2.568	2.244	2.874	7.686
Expression Ability	2.649	2.609	2.631	7.888
c	7.640	7.510	8.581	

Table 36: Degree of total influence for three criteria of communication

Criteria	r	c	row+column	Rank	row-column	Rank
Oral Chinese	8.156	7.640	15.796	2	0.517	1
Learner's language	7.686	7.510	15.195	3	0.176	2
Expression Ability	7.888	8.581	16.469	1	-0.693	3

VI. Criteria for Professional Development

Table 37: Initial average matrix A for three criteria of professional development

A-matrix	Chinese Grammar	Use of Technology	Collaborate with Colleagues	Sum
Chinese Grammar	0.000	2.133	1.533	3.667
Use of Technology	1.733	0.000	2.067	3.800
Collaborate with Colleagues	1.800	2.000	0.000	3.800
Sum	3.533	4.133	3.600	

In Table 33, the sum of the third column is the maximum value (4.133). Then, based on equation and the values of the average matrix A (Table 33), a direct influence matrix D is obtained and created in Table 34.

Table 38: Direct influence matrix D for three criteria of professional development

D-matrix	Chinese Grammar	Use of Technology	Collaborate with Colleagues
Chinese Grammar	0.000	0.516	0.371
Use of Technology	0.419	0.000	0.500
Collaborate with Colleagues	0.435	0.484	0.000

As Table 35 minus Table 34, the Indirect influence matrix I-D for three criteria of professional development is obtained and created in Table 36.

Table 39: I-matrix for three criteria of professional development

I matrix	Chinese Grammar	Use of Technology	Collaborate with Colleagues
Chinese Grammar	1	0	0
Use of Technology	0	1	0
Collaborate with Colleagues	0	0	1

Table 40: Indirect influence matrix I-D for three criteria of professional development

I-D matrix	Chinese Grammar	Use of Technology	Collaborate with Colleagues
Chinese Grammar	1.000	-0.516	-0.371
Use of Technology	-0.419	1.000	-0.500
Collaborate with Colleagues	-0.435	-0.484	1.000

Table 41: I/(I-D) matrix for three criteria of professional development

I/(I-D) matrix	Chinese Grammar	Use of Technology	Collaborate with Colleagues
Chinese Grammar	3.940	3.615	3.269
Use of Technology	3.311	4.357	3.407
Collaborate with Colleagues	3.318	3.683	4.072

Table 38 presents the total influence matrix according to the calculation method introduced in the above research method.

Table 42: Total influence matrix T for three criteria of professional development

T=D*(I-D)⁻¹ matrix	Chinese Grammar	Use of Technology	Collaborate with Colleagues	r
Chinese Grammar	2.940	3.615	3.269	9.824
Use of Technology	3.311	3.357	3.407	10.076
Collaborate with Colleagues	3.318	3.683	3.072	10.073
c	9.569	10.656	9.748	

Table 43: Degree of total influence for three criteria of professional development

Criteria	r	c	row+column	Rank	row-column	Rank
Chinese Grammar	9.824	9.569	19.393	3	0.256	2
Use of Technology	10.076	10.656	20.731	1	-0.580	3
Collaborate with Colleagues	10.073	9.748	19.821	2	0.324	1