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### **HIGH EDUCATION RADICAL TRANSFORMATION ERA: HOW TEACHERS' COMPETENCY CAN ENHANCE THE STUDENTS' EMPLOYABILITY?**

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# High Education Radical Transformation Era: How Teachers' Competency can enhance the Students' Employability?

Ming-Yuan HSIEH<sup>1</sup>, Muhammet USAK<sup>2</sup>

## Abstract

In order to assess the correlation between teachers' competency and a higher education students' employability, this research systematically cross-employs the Analytical Network Process (ANP) approach of quantitative analysis and the Fuzzy Set Qualitative Comparative Analysis (fsQCA) method of qualitative analysis to measure a series of questionnaire results from two groups of experts. As a result, the most valuable and contributive conclusion is that the three core teachers' competency (Cooperative Relationship Competency - Social Developing Techniques, Cooperative Relationship Competency -Interflow Communication Abilities and Resource Satisfaction Competency - Teaching Resource Distribution) are supposed to systematically develop the three core student's employability (Knowledge Competencies: Job Discovering, Knowledge Competencies: Problem Shooting and Knowledge Competencies: Sense of Value and Costs) resulting in an enhance value for a college degree as well as empirically advancing higher employment rate for higher education graduates in Taiwan.

*Keywords:* students' employability, teachers' competency, analytical network process p approach, fuzzy set qualitative comparative analysis.

## Introduction

As a result of the rapid expansion in the number of higher education institutions in Taiwan, the majority of these Taiwanese higher education institutions are now confronting lower educational resources and recruiting rates that have led the higher education industry into a slump in Taiwan. Moreover, an increase in the number of higher education institutes in Taiwan, which now stands at 167 institutions both public and private, has also contributed to the current state in the higher education

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sector. This industry growth has caused the overall acceptance rate at Taiwanese higher education institutes to increase to 95.7% in 2014, compared to an acceptance rate of only 40% in 1991. This development has led to not only a serious dilution of higher education resources and lecture quality but it has also impacted the unemployment rate of the Taiwanese college graduates. According to the 2017 annual report of the Ministry of Labour of Taiwan, the statistical unemployed population with a college or university degree has increased to approximately 270,000 from 110,000 in 1998. The unemployed rate of people with a college or university degree has been around 5% for the past six years and has been about one percent higher than the overall unemployment rate in Taiwan as shown in Table 1. As specified in the 2017 annual report of Ministry of Education, nearly 14% of the higher education gradutors with a bachelor, master or doctoral degree are unable to obtain a job in their field of study.

Year	Entire Taiwan (%)	Male (%)	Female (%)	Education Level (%)					
				elementary school (%)	Junior High School (%)	Senior High School (%)	Higher vocational education (%)	Diploma / certificate (%)	University or above (%)
2012	4.24	4.49	3.92	2.32	4.27	4.45	4.15	3.18	5.37
2013	4.18	4.47	3.80	2.29	4.29	4.25	4.06	3.11	5.26
2014	3.96	4.27	3.56	2.04	3.87	3.79	3.85	3.09	4.99
2015	3.78	4.05	3.44	1.84	3.29	3.80	3.84	2.75	4.79
2016	3.92	4.19	3.57	2.31	3.52	3.99	3.87	2.91	4.84
2017	3.76	4.03	3.42	2.25	3.29	3.88	3.72	2.79	4.63

Table 1: Unemployed Rate in Taiwan.

In order to solve the unemployment problem among college graduates, the Ministry of Education in Taiwan has instituted solutions based from three perspectives:

1. The graduated student perspective: In 2017, over 300,000 students graduated from higher education institutions in Taiwan. However, the recruiting market in Taiwan for these college graduates is approximately 200,000. Furthermore, a majority of Taiwanese corporations have skepticism in the professional value of a Taiwanese higher education diploma due to the very high current acceptance rates at the Taiwanese higher education institutes. For this reason, the majority of Taiwanese higher education institutes have commenced to strongly introduce various professional or technical certificates at universities of technology, business, research and education, to enforce the student's professional capability after their graduation. Therefore, the famous higher education evaluation organization, nowadays, have settled the graduator's employment rate to be one of the assessed Performance Key Indicators ("KPIs") in this evaluation system.

2. The higher education institute perspective: In order to advance the employability of Taiwanese college graduates, the Ministry of Education is tracking employment rates of college graduates as an assessed Key Performance Indicator (KPI) in the compensation policy to higher education institutes. This has resulted in the majority of Taiwanese higher education professors to commence adjusting their teaching goal from “research-orientation and lecture-orientation” to “employment-orientation” in their essential and elective courses.
3. The government college graduate employment policies perspective: From 2014 to 2016, the Executive Yuan in Taiwan has disbursed \$14,015,766,000 NTD (New Taiwan Dollars) to 64 employment projects to stimulate the hiring of college graduates. These projects integrate various relative governmental departments including the Ministry of Education, Ministry of Labour, Ministry of Economy Affairs, Ministry of Foreign Affairs, Ministry of National Defence, Ministry of Science and Technology, Council of Agriculture, Council of Indigenous Peoples and etc., in order to establish higher effectiveness and efficiency interdepartmental communication employment policies and political packages for really advancing the core employability and employment experience of college graduates. In particular, these 64 projects have successfully assisted 150,000 college graduates enter the employment workplaces according to the 2017 annual report of the Taiwanese Executive Yuan.

However, the most crucial problem is not only the majority of higher education graduated students were difficult to express their effective employability in their employment but a bulk of Taiwanese enterprises were also hard to recruit talent employees from Taiwanese higher education institutions. As a result, “what is the most efficient employability of higher education gradulators for the current employment market” and “what is the most effective teachers’ competency to be able to be advance the most practical students’ employability” have been the two most core key-issues for current Taiwanese higher education institutes (Zeljčić, 2015; Kubiak *et al.*, 2018). However, making a comprehensive survey into teacher competency and students employability in Taiwan higher education, there is no research is able to inductively point out the auto-correlatoionship between teacher’s competency and student’s employability through surveyed cross-measurements among academic scholars, empirical corporate management, and governmental officers. Therefore, the Analytical Network Process (“ANP”) of the quantitative analysis (Hsieh, 2018) were systematically cross-applied in the weighted-measurements among academic scholars, empirical corporate management, and governmental officers. Further, the Fuzzy Set Qualitative Comparative Analysis (“fsQCA”) method of qualitative analysis (Hsieh *et al.*, 2018) was employed to testify the consequences of weighted-measurements for advancing the research reliability and validity for detecting the best solution of the two most core key issues in order to discover the best solution for research

question: “How Teachers’ Competency can Enhance A Higher Education Students’ Employability”. There are few studies that directly probed, in qualitative research, the interactive influences, interrelationships and interactions between teacher’s competency and student’s employability. As a result, this research hierarchically cross-employed the ANP approach of quantitative analysis as well as systematically applied the fsQCA method of qualitative analysis to synthetically evaluate questionnaire results from three expert groups on the assessed criteria of teacher’s competency and student’s employability (Hsieh, 2018). Therefore, the teacher’s competency, student’s employability and statistics methodology were expressed in detail below (Hsieh, 2018).

### *Teachers’ Competency*

In terms of the definition of Chinese teacher duties from the famous sage, Han, Yu in Tang dynasty, teachers have been responsible for their students with the traditional duties that is “propagating the doctrine, imparting professional knowledge, and resolving doubts” to their students resulted in Chinese teachers have been considered as almighty person in the teaching processes (Hsieh, 2018). A teacher is to teach us the fundamental relationship between oneself and the society, the knowledge and skills to live in the society, and to help us answer questions in the learning process. However, in association with the authors’ related researches regarding the teacher’s competency (Chan *et al.*, 2017), Hammersley-Fletcher (2002) clearly addressed the essential concept of individual competency is to comprehend personal knowledge, individual value, professional attitude and individual potential from the accumulation of individual working experience (Hoult, 2004). Continuously, the internal tangible knowledge skills and techniques and the external intangible self-concept, self-characteristic and self-motivation were included in the expanded concept of individual competency (Hughes, 2004). As a result, in connection with the Teachers’ Competency (“TC”), the majority of teachers are willing to apply their own professional knowledge through their own teaching methods and these professional knowledge (Hsieh, 2017) comprehended (1) basic knowledge: knowledge of self and students, knowledge of subject matter and knowledge of educational theory and research and (2) basic abilities: teaching skills and techniques and interpersonal skills (Kirby *et al.*, 2011; Abualrob, 2019; Ural & Gencoglan, 2020). That nurtures each student’s capability in order to increase their working diversified employability because teacher’s competency includes the teacher’s individual teaching value-brief, professional knowledge and introspection (Kirkham, 2004).

In consideration with teaching methods, the Teacher Professional Competences Theory (“TPCT”) clearly addresses that TC covers the teacher’s essential knowledge, cross-subject professional and real-life experiences which are able to result in the professional knowledge and character formation (Gay, 2000). Subsequently, Mehaffy (2012) developed five TC competency categories and

these are (1) curriculum knowledge, (2) general pedagogical knowledge, (3) content knowledge, (4) pedagogical content knowledge and (5) knowledge of learners and their characteristics (Usak, Ozden & Eilks, 2011; Usak et al., 2013). Continuously, Shulman (1986) and Shulman (1987) systematically list four teacher individual ability competences and these are (1) the teaching situation analytical competency for editing useful teaching materials, (2) the specific lecturing approach competency for leading students to break through their myths, (3) the technological utilization competence for adopting digital education technology and (4) the social relationship competence for connecting cordial relations between teachers and students. Specifically, Glatthorn *et al.* (2006) distinctively categorized four analytical aspects and these are (1) Individual Demand Competency (“IDC”): IDC covers two individual characters of Self-transcendence (“St”) and Emotion-control (“Ec”) in the teaching processes (Lambert *et al.*, 1996), Professional Knowledge Competency (“PKC”): PKC includes three coaching abilities of Subject Knowledge Lecturing (“SKL”), Problem-solving Techniques (“PsT”) and Classroom Management Skills (“CMS”) (Lieberman, 1956) in the teaching methods, Resource Satisfaction Competency (“RSC”): RSC comprehends two supporting resource of Teaching Resource Distribution (“TRD”) and School’s Administrative Satisfaction (“SAS”) in teaching actions for educational institutes (Lo, 2016) as well as Cooperative Relationship Competency (“CRC”): CRC comprises of two relationship development of Social Developing Techniques (“SDT”) and Interflow Communication Abilities (“ICA”) in education behaviours (Lunn, & Bishop, 2002; Gliniecka, 2016). Moreover, there are 9 assessed criteria to be integrated as illustrated in *Figure 1*.

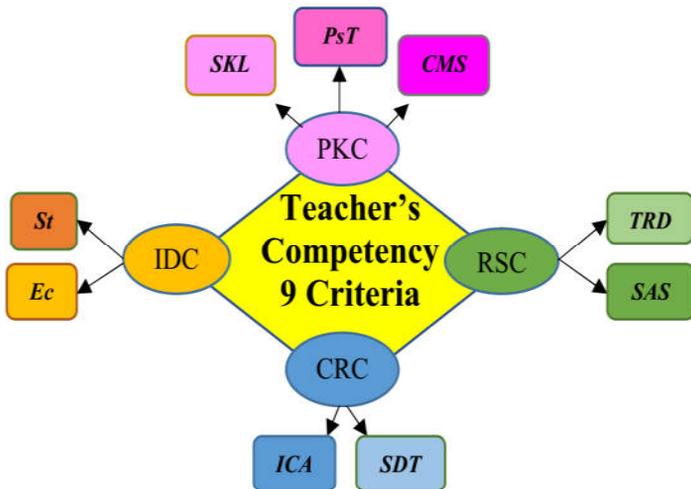
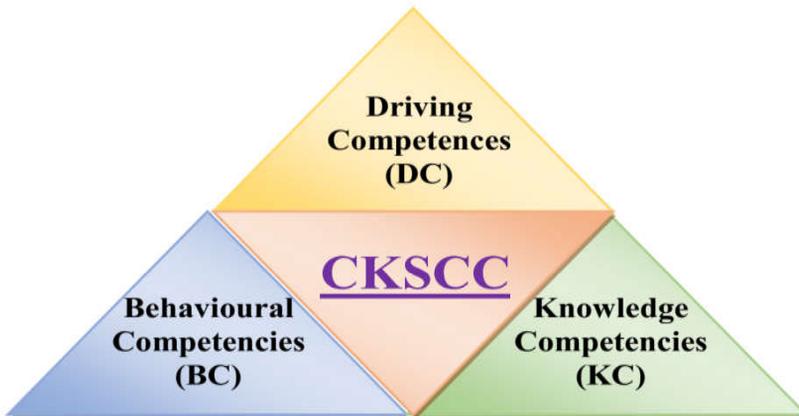


Figure 1. Teacher’s Competency 9 Criteria

*Student's Employability*

Since 1990s, the industrial developed countries have devoted to developing the most necessary core knowledge and skill competencies to establish a series of structural and systematic labour employment competencies through various cooperative projects between government departments and private companies in order to effectively institute the most potential mechanism for advancing the development of national labour capital. Specifically, National Development Council (“NDC”) in Taiwan promulgated the “Service Industry Development Guiding Principles and Action Program” of the twelve national proactive service industry development mechanism that provided the Workforce Development Agency, Ministry of Labour the resolution to execute “Core Knowledge and Skill Competencies Courses (CKSCC)” of “Universal Common Core Knowledge and Skill Competencies Project”. These CKSCC assists the majority of Taiwanese students to develop the most useful student’s employability for in the current main selections (doing academic researches, taking government position examination and finding corporate jobs) after their graduation from higher education institutes. Comprehensively, there are the essential competences to be the most core competence perspectives in the “Core Knowledge and Skill Competencies Courses (CKSCC) and these are the (1) Driving Competences (“DC”) : the DC was created to construct the self-motiving recognition training in labour employment for enhancing national labour force, (2) Behavioural Competencies (“BC”): the BC was invented to establish the self-identification training in labour employment for strengthening national labour compatibility and (3) Knowledge Competencies (“KC”) : the KC was discovered to build the self-acknowledging training in labour management for enriching national labour acknowledgement as expressed in *Figure 2*.



*Figure 2.* Three core structure of CKSCC.

In detail, DC includes D1: Job Value and Job Vision (“JV-JS”): JV-JS which focuses on the employee’s aptitude, value, life philosophy in career, D2: Socialization and Presentation (“S-P”): S-P which emphasizes the efficiency, effectiveness, and performance in work and self-identification and self-recognition of working position in society and D3: Self-Stimulating and Self-Regulating (“SS-SR”): SS-SR which accentuates professional attitude, respect, self-abnegation, self-image formation and self-emotion controlling in work; (2) BC was invented to establish the self-identification training in labour employment for strengthening national labour compatibility and BC covers B1: Corresponding and Collaborating (“C-C”): C-C highlights the internal communication in organization and external connection with other companies in order to crest the horizontal cooperation as well as a set of the policies, rules and regulations and laws related with corporate business fields, B2: Team Work and Coachmanship (“TW-C”): remarks the effective and efficient synergy of team-work model in organization and B3: Collegueship and Conflict Management (“C-CM”): C-CM concentrates the associated relationship between corporate goal and mission and employee’s career development in order to reduce the interested conflicts between organization and individual as well as (3) Knowledge Competencies (“KC”): the KC was discovered to build the self-acknowledging training in labour management for enriching national labour acknowledgement and KC contains K1: Job Discovering (“JD”): JD focuses on the exploration and recognition in employment environment in order to upgrade the employee’s knowledge and understand the developed tendency in employment market, K2: Sense of Value and Costs (“S-V-C”): S-V-C emphasizes the essential definition of cost recognition and controlling and value addition concept and K3: Problem Shooting (“PS”): PS outlets the description, definition, analyses and solution of confronting problems.

### *Statistics Methodology*

The main purpose of this research is, to refine and then, determine the perceptions of school principals about the concept of social capital. Hence, the answers for the following research questions have been sought: “How Teachers’ Competency can enhance A Higher Education Students’ Employability”. As a result, in consideration of assessable measurement for the best solution of research question, not only the quantitative analysis of the ANP approach was cross-applied to systemically and hierarchically assay the questionnaire results from the participated experts. The qualitative analysis of the fsQCA methods were cross-employed to systematically verify the measured consequences of the ANP approach in order to create the highest research reliability and validity. Taking the auto-correlation among each assessed criteria of the ANP approach into account, the pairwise comparison is executively measured for the local priority vector  $w$  (eigenvector) as the unique solution and furthermore, the  $w$  (eigenvector)

is defined as the local priority vector. Apparently, the computed equation of two-stage algorithm in pairwise comparison was induced as

$$Rw = \lambda_{\max} w; w_i = \sum_{j=1}^m \left( R_{ij} / \sum_{j=1}^m R_{ij} \right) / m \quad (1)$$

Subsequently, in assessable measurements of pairwise comparison matrix between each assessed criterion, the consistency of compared factors have to match transitivity in order to achieving the surveyed expert's representativeness. In consideration with the consistency in each pairwise comparison matrix, the consistency index ("C.I.") and the consistency ratio ("C.R.") are described as

$$C.I. = (\lambda_{\max} - n) / (n - 1) \quad (2)$$

The consistency ratio ("C.R.") is expressed as

$$C.R. = (C.I. / R.I.) \quad (3)$$

s.t. Random Index (*R.I.*) acquired from the statistic table of random index figure.

Significantly, in association of assumption, the necessarily acceptable identification in consistency among each assessed criterion is that the evaluated numbers of *C.R.* and *C.I.* in pairwise comparison matrix that both are necessary smaller than 0.1.

In order to strengthen the research validity, the fsQCA method of qualitative analysis was further employed to verify the statistic measurements of the ANP approach based on the specific assessable measurements of the fsQCA method. Statistically, the two major analytical measured conditions were necessarily considered into the original assumptions between independent variable (" $X_i$  values") and independent variable (" $Y_i$  values") and continuously, the two measured conditions are (1) "sufficient analysis": any "in" variable is able to be only "possibly" and not be "necessarily" bring about "out" variables and (2) "necessarity analysis": any "in" variable is necessary to lead to "out" variable. In order to quantified measurements between  $X_i$  and  $Y_i$  values into the two measured conditions, the "consistency" and "coverage" score numbers among  $X_i$  and  $Y_i$  values were systematically testified because the "consistency" score numbers are the extent for which a causal combination produces an evaluated outcome and the "coverage" numbers are how many appraised data with the evaluated outcome

expressed by a causal condition. Critically, if  $X_i$  values are entire less than or equal to their corresponding  $Y_i$  values, consistency score numbers of sufficient analysis is 1; if there are only a few near misses, consistency score numbers of sufficient analysis is slightly less than 1 and if there are many inconsistent scores, with some  $X_i$  values greatly exceeding their corresponding  $Y_i$  values, the consistency score of sufficient analysis drops below 0.5 (Hsieh, 2018). Hence, the equations of the “consistency” and “coverage” score numbers were described as

$$\text{consistency}(X_i \leq Y_i) = \frac{\sum \min(X_i, Y_i)}{\sum X_i};$$

$$\text{coverage}(X_i \leq Y_i) = \frac{\sum \min(X_i, Y_i)}{\sum Y_i}$$

(4)

Therefore, if the consistent level of “in” is increased when the numbers of “in” variables are larger than the numbers of “out” variables and then, a set of the level of “in” variables will be “necessity analysis” to be a set of “out” variables when “min” points out the selection of the lower of the two values of “in” and “out” variables. The three evaluated sets are (1) the “consistency” score numbers of sufficient analysis is equal to 1 during the  $X_i$  values are all less than or equal to their corresponding  $Y_i$  values; (2) the “consistency” score numbers of sufficient analysis is slightly less than 1 which means a few near misses have been appeared and (3) the “consistency” score numbers of sufficient analysis drops below 0.5 during some  $X_i$  values greatly exceeding their corresponding  $Y_i$  values (Hsieh, 2017). In statistic, the equation (7) of “consistency” and “coverage” of necessity analysis are measured as

$$\text{consistency}(X_i > Y_i) = \frac{\sum \min(X_i, Y_i)}{\sum X_i};$$

$$\text{coverage}(X_i > Y_i) = \frac{\sum \min(X_i, Y_i)}{\sum Y_i}$$

(5)

Eventually, if the consistent level of a combination set “in” variables is also increased when the numbers of a combination set “in” variables are bigger than the numbers of a combination set “out” variables and then, a set of the level of a combination set “in” variables is going to be “necessity analysis” to a combination set “out” variables (Hsieh, 2017). The three evaluated sets are (1) all  $Y_i$  values are less than or equal to their corresponding  $X_i$  values, this equations returns a

value of 1 and (2) many  $Y_i$  exceed their corresponding  $X_i$  values by wide margins, it returns a value less than 0.5). The equations of “consistency” and “coverage” of necessity analysis are described as

$$\text{consistency}(X_i \succ Y_i) = \frac{\sum \min(X_i, Y_i)}{\sum X_i};$$
$$\text{coverage}(X_i \succ Y_i) = \frac{\sum \min(X_i, Y_i)}{\sum Y_i}$$

(6)

## Methodology

This research was created and carried out in a qualitative design. Qualitative researches are the researches which is not limited with a single method, providing in-depth information about the situation investigated, enabling access to different views of the participants, seeking answers to the how and why questions and giving generalized information as the results (Flick *et al.*, 2004). Qualitative researches are more interested in the process than the product or output. Therefore, meanings that are important in qualitative research (Merriam, 2009).

### *Interviewed Participants*

In consideration of research reliability and representativeness in the measurements of the ANP approach and entropy methods, the interviewed participants consists of two expert's groups with each group comprised of ten experts in teacher competency and student employability. In order to increase the research representativeness in association with the analytical perspectives between teachers' competencies and student employability, the two expert's groups were surveyed in the analytical measurements of the ANP approach and the entropy method. The 15 experts of first group were interviewed for the expert's surveyed questionnaires of assessed measurements in the ANP model in order to identify the most core teacher's competencies. These empirical experts comprised of 5 senior professors with over 5-10 years research experience in the teachers' competency field, 5 senior researchers with over 5-10 years in lecturing methods of higher education institutes and 5 senior teaching consultants with 2-5 working experience in the teachers' training centers at current higher education institutes.

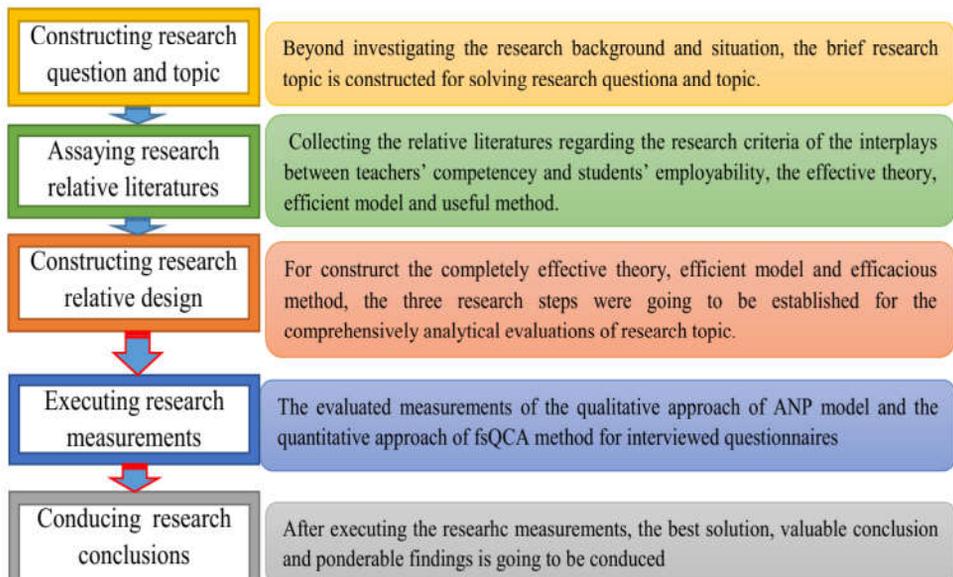
Subsequently, the 15 experts in the second expert's group were surveyed for the weighted-questionnaires of assessed measurements of the ANP approach in order to recognize the most critical students' employability. These professional experts comprised of 5 senior researchers with over 5 years of research experience in the human resource management research field, 5 senior managers with over 10

years of working experience in human resource departments of various industries and 5 senior employment consultants with over 5 years of working experience in recruiting and training. Statistically, the questionnaire’s selection is 5-Likert’s weight-scale to measure transitivity, comparing weights principle, evaluating criteria, and estimating positive reciprocal matrix and supermatrix in the ANP model and entropy method. Significantly, each assessable criteria are necessarily refined as geometric mean for each 5-Likert’s weight-scale:

$$\sqrt[n]{\prod_{i=1}^n X_i} = \sqrt[n]{X_1 * X_2 * \dots * X_n}, X_i = \{X_i(k) | k = 1, 2, \dots, n\}, i = 1, 2, \dots, n \tag{7}$$

*Research Design*

In order to find the empirical conclusion for the research question: “How to Transmit Teacher’s Competency to Be Student’s Employability in The Taiwanese Higher Education Great Recession Era?”, four research procedures were designed as shown in *Figure 3*:



*Figure 3*: The core structure of research design

In association with the best conclusion for research topic and question, the core TC and SE evaluated hierarchies of qualitative approach of the ANP model was established as shown in *Figure 4 and 5*.

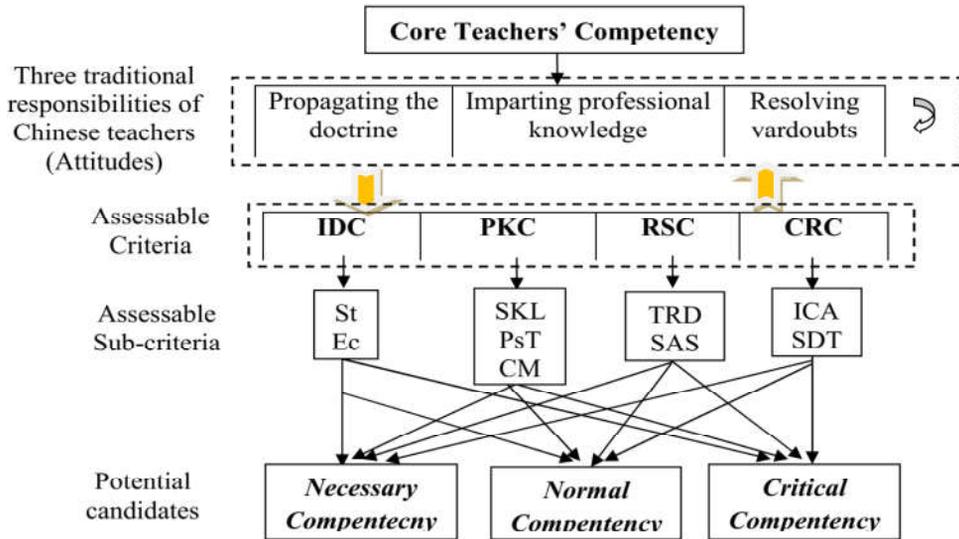


Figure 4. Essential evaluated framework of Core Teacher's Competencies

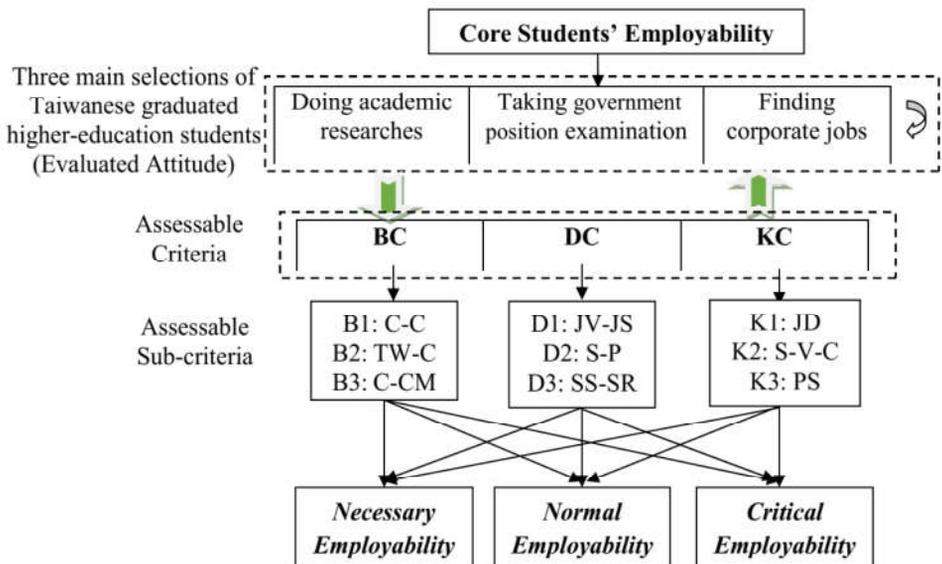


Figure 5. Essential evaluated framework of Core Student's Employability

## Results

Statistically, the ANP approach was applied to measure the weighted results of completed questionnaires on each potential candidate in Figure 4 and 5 for the core teacher's competency and the core student's employability by means of the pairwise compared matrixes. Additionally, in order to reflect the comparative score for the all kinds of each potential candidate for the core teacher's competency and the core teacher's competency in Figure 4 and 5 to problem-solve the research issue, the equation (4) was induced from the mergers of the ANP brief equations and the research design hierarchy (see Figure 4 and 5.) for comprehensively measuring comparative related priority weight  $w$  (eigenvector) in the matrix. Therefore, the best solutions (candidate) were selected by calculating the

synthetically comparative index numbers ("SCIN",  $D_i = \sum_{j=1}^s \sum_{k=1}^{kj} P_j T_{kj} R_{ikj}$ ), based

on equation (2), (3), (4) and (7).

Where the importance of related priority weight  $w$  (eigenvector) for assessable criterion  $j$ ; is the importance of related priority weight  $w$  (eigenvector) for assessable characteristic  $k$  of criterion  $j$  and is the important potential candidate  $i$  (business website  $i$ ) on the characteristic  $k$  of criterion  $j$ .

Particularly, in relation with a series computed consequences, Table 2 hierarchically demonstrated the ANP approach results of the core teacher's competency according to Figure 4. First, the highest standardized SCIN of the three candidates (teacher's competency) of 0.7312 was located in the "Critical Competency" and the top three weights scores were further located in the "and CRS-SDT (Cooperative Relationship Competency - Social Developing Techniques) (0.4664), CRC-ICA (Cooperative Relationship Competency - Interflow Communication Abilities) (0.4705) and RSC-TRD (Resource Satisfaction Competency - Teaching Resource Distribution) (0.1807)". Subsequently, Table 3 systematically illustrated the ANP approach results of the core student's employability in terms of Figure 5. In succession, the highest standardization SCINs of the three candidates (student's employability) of 0.7214 was located in the "Critical Employability" and the top three weights scores were further located in the "and K1: JD (Knowledge Competencies: Job Discovering) (0.5294), K3: PS (Knowledge Competencies: Problem Shooting) (0.5166) and K2: S-V-C (Knowledge Competencies: Sense of Value and Costs) (0.5152)".

Table 2: ANP approach results of the core teachers' competency

Criteria	Weights	Sub-criteria	Necessary Competency		Normal Competency		Critical Competency	
			Weights	Evaluated Score	Weights	Evaluated Score	Weights	Evaluated Score
IDC	0.0315	St	0.0634	0.0020	0.2157	0.0068	0.7209	0.0227
		Ec	0.0581	0.0018	0.2155	0.0068	0.7265	0.0229
PKC	0.0849	SKL	0.0622	0.0053	0.2248	0.0191	0.7131	0.0606
		PsT	0.0624	0.0053	0.2116	0.0180	0.7260	0.0617
		CMS	0.0621	0.0053	0.2125	0.0180	0.7255	0.0616
RSC	0.2478	TRD	0.0632	0.0157	0.2074	0.0514	0.7294	0.1807
		SAS	0.0627	0.0155	0.2211	0.0548	0.7162	0.1775
CRC	0.6358	ICA	0.0604	0.0384	0.1996	0.1269	0.7400	0.4705
		SDT	0.0614	0.0391	0.2050	0.1303	0.7336	0.4664
Standardized SCIN				0.0616		0.2072		0.7312

Table 3: ANP approach results of the core students' employability

Criteria	Weights	Sub-criteria	Necessary Employability		Normal Employability		Critical Employability	
			Weights	Evaluated Score	Weights	Evaluated Score	Weights	Evaluated Score
BC	0.0641	B1: C-C	0.0607	0.0039	0.2203	0.0141	0.719	0.0461
		B2: TW-C	0.0636	0.0041	0.2186	0.014	0.7178	0.046
		B3: C-CM	0.0684	0.0044	0.2339	0.015	0.6978	0.0448
DC	0.2168	D1: JV-JS	0.0597	0.0129	0.2256	0.0489	0.7146	0.1549
		D2: S-P	0.0625	0.0135	0.2267	0.0492	0.7108	0.1541
		D3: SS-SR	0.0578	0.0125	0.2175	0.0472	0.7247	0.1571
KC	0.7191	<b>K1: JD</b>	0.0578	<b>0.0415</b>	0.206	<b>0.1481</b>	0.7363	<b>0.5294</b>
		K2: S-V-C	0.0612	<b>0.044</b>	0.2224	<b>0.1599</b>	0.7164	<b>0.5152</b>
		<b>K3: PS</b>	0.0607	<b>0.0437</b>	0.2208	<b>0.1588</b>	0.7185	<b>0.5166</b>
Standardized SCIN				0.0602		0.2184		0.7214

In increment with the research validity, the fsQCA method of qualitative analysis was employed to verify a series of measured weights of each sub-criterion and selected candidate (evaluated score) in *Table 1* and *2*. Extraordinarily, *Table 4* apparently described that the solution coverage and consistency of the solved combinations , “a1\*a2\*a3\*b1\*b2\*b3”, are 0.97006 and 1 which means all measured sub-criteria and selected candidates (evaluated scores) belongs “sufficient analysis” not “necessarity analysis” for testifying the correlationships among the most effective student’s employability and teacher’s competency.

Table 3: Consequences of fsQCA method in response with the results of FA approaches

	raw coverage	unique coverage	consistency
a1*a2*a3*b1*b2*b3	0.97006	0.97006	1
solution coverage: 0.97006 solution consistency: 1			
Definition: a1: Critical Competency; a2: Normal Competency ; a3: Necessary Competency; b1: Critical Employability; b2: Normal Employability; b3: Necessary Employability			

### Conclusion

In particular, this research applies the ANP approach of the quantitative analysis to compute a series of the weighted-measurements of the two professional expert’s surveyed groups as well as further testify these consequences of weighted-measurements for advancing the research reliability and validity by means of the employment of the fsQCA method of qualitative analysis not only for detecting the best solution of the two most core key issues but also discovering the best solution for achieving the research goal. As a result, according to a series of crucial measurements, the most valuable and contributive conclusion is that the Job Discovering (JD), Problem Shooting (PS) and of Sense of Value and Costs (S-V-C) of Knowledge Competencies are the most effective student’s employability by means of the nourishment of the Social Developing Techniques (SDT) and the Interflow Communication Abilities (ICA) of Cooperative Relationship Competency (CRS) and Teaching Resource Distribution (TRD) of Resource Satisfaction Competency (RSC) from the higher education teachers’ competency. Therefore, the three effective teachers’ competency of Interflow Communication Abilities (ICA) of Cooperative Relationship Competency (CRS) and Teaching Resource Distribution (TRD) of Resource Satisfaction Competency (RSC) are necessary to systematically developed for increasing not only the student’s employability but to also add value of higher education in order to eventually strengthen student’s employment rate in Taiwan.

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