Teachers' Competency Indicators in Research Universities under Jiangsu Province

Lin Tingting
Chuanchom Chinatangkul
Kamolmal Chaisirithanya
Leadership in Educational Administration,
Faculty of Education, Bangkokthonburi University
Email: 253844700@qq.com
Received : 20 September 2023
Revised : 24 June 2024
Accepted : 24 June 2024

ABSTRACT

The research objectives were: (1) to explore the components of teachers' competency in research universities under Jiangsu Province; and (2) to verify teachers' competency indicators in research universities under Jiangsu Province.

This research was a mixed method research, including quantitative research and qualitative research. The population consisted of 9178 teachers from eight research universities under Jiangsu province. The sample size was determined by Taro Yamane formula program obtained through stratified random sampling technique. There were 383 teachers in total. Eight experts key informants were gained through purposive sampling methods. The instruments used for data collection are semi-structured interview form and five-point rating scale questionnaire. Statistics used for data analysis included frequency, percentage, mean, Standard Deviation, Exploratory Factor Analysis and Delphi Technique.

The research findings revealed that:(1) there were three components of teachers' competency indicators in research university under Jiangsu province which consisted of basic quality**;** teaching ability and research ability; (2) the 15 indicator of teachers' competency in research universities under Jiangsu province verified by 17 experts: good learning ability, good communication and teamwork skills, strong information search ability, good observation and insight , the ability to analyze the problems, affinity and have a harmonious relationship with the students, good organizational skills, advanced educational concepts,

solid academic background, good scientific ethics, good scientific ethics, the spirit of dedication to scientific research , good critical thinking , persistence and focus of the research , innovative thinking.

Keywords: Teachers' competency, Competency indicators, Research university, Jiangsu province

1. Introduction

According to records, the earliest research university was the University of Berlin in Germany, founded in 1810, the founder Wilhelm von Humboldt put forward through scientific research methods and teaching and scientific research method to pursue the idea of pure knowledge, make scientific research for the first time become university functions, created the university 'research and teaching'.

Wilhelm von Humboldt based on the educational philosophy of "university autonomy", "academic freedom" and "integration of teaching and research" has also made the University of Berlin a target for countries to follow suit, especially in the United States, where many scholars have gone to study and brought back the German experience, Johns Hopkins university in 1876, became a new milestone in the modern sense of the birth of the research university.

After more than 100 years of development, the achievements of research universities occupy their leading position in the world of science and higher education circles.

The basic characteristics of a research-oriented university are the following six points: First, advanced school management concept and distinctive school-running characteristics. Second, the convergence of academic masters, outstanding scientific research achievements. Third, high-level research, permeated into classroom teaching. Fourth, the quality of students is first-class, and the "teacher-student ratio" is moderate. Fifth, with abundant scientific research funds and superior conditions for running schools. Sixth, the variety of complete disciplines, scientific and standardized management.

China has implemented the "211" project since 1995, Since the implementation of the "985" project in 1985, Has developed a number of research universities, China's research universities are selected by the state education administration according to academic and educational standards.

These universities on the list will receive strong national and local support, mainly for the purpose of cultivating outstanding talents, higher academic level, with a large number of doctoral programs and awarded doctoral degrees. The ratio of undergraduate and graduate students is around 1:2.5, A complete range of disciplines, strong ability to raise funds.

As the province with the largest number of universities in China, Jiangsu Province has several high-quality research universities, which play an exemplary role in cultivating innovative talents, improving academic status, accelerating the transformation of achievements, directly serving the society and promoting international exchanges, and playing an exemplary role in adhering to educational innovation, improving the level of school-running, and ensuring the quality of teaching. This is a new platform for higher education in Jiangsu Province to leap to a new level and form new advantages; Economic and social development can be supported by new goals of stronger talent and intelligence.

As a prerequisite for cultivating innovative talents, teachers can correctly guide students 'sense of innovation, deeply develop students' innovation potential, and create a superior innovation atmosphere for students through a good teacher-student relationship. If a university has a group of innovative teachers, then the students trained by the university will be more innovative consciousness and innovative ability.

How to measure the competency of faculty in research universities and to verify teachers’ competence indicators for research universities in Jiangsu Province? This should be an important measure to improve the teaching mode of research universities in Jiangsu Province and build the teaching quality of Jiangsu Province from a large higher education province to a strong higher education province.

2. Research Questions

1. What are the components of teachers’ competency in research university?

2. What are the verified teachers’ competency indicators in research universities under Jiangsu Province?

3.Research Objectives

1. To explore the components of teachers’ competency in research university under Jiangsu Province.

2. To verify the teachers’ competency indicators in research universities under

Jiangsu Province.

4.Research Method

4.1 Research Design

This dissertation mainly adopts the mixed research methods of quantitative research and qualitative research. The phase 1 is Qualitative research: The researcher studied the concepts, principles and theories of the components of teachers' competency indicators in research universities under Jiangsu Province, and conducted in-depth interviews with 8 experts. The phase 2 is Quantitative research: The researcher selected the validity variables of the competency of teachers in Jiangsu research universities from phase 1, and compiled a questionnaire to explore the components of the competency model of teachers in Jiangsu research universities, and established a sample data collection tool. The phase 3 is qualitative research using Delphi Technique to select various and indicators of the teacher competency indicators of Jiangsu research universities from phase 2, and verify the teacher competent indicators of Jiangsu research universities by 17 key informants.

4.2 Population and Sample

The phase 1 Qualitative research: In-depth interviews with 8 key informants, the phase 2 population included teachers in Jiangsu Province. Choose 383 teachers from totally 9178 faculty members. The sample group will be selected by using proportional stratified random sampling from Taro Yamane formula totally 383 teachers.

4.3 Research Instruments

Phase1: Collect the relevant literature on the teachers' competency indicators in research university by semi-structured interview format. Phase 2: The instrument for this phase is questionnaire. Phase 3: A five-point rating scale questionnaires for Delphi Technique.

4.4 Data Collection

Phase 1: Data collection was performed by the researcher, through 20 documents and the interview of 8 experts. Phase 2: The questionnaires were sent by online and mail. Information on the indicators of teachers' competency in research universities under Jiangsu Province was collected by filling in the questionnaire of 383 teachers. Phase 3: Checklist will be sent to the panel of experts by mail and online. The data collected in this stage mainly consisted of interviews and surveys conducted by 17 experts.

4.5 Data Analysis

Phase 1: The collected data was analyzed by Content Analysis statistics using frequency and percentage. Phase 2: Data for demographic variables were analyzed by frequency and percentage. Descriptive statistics were used to analyze the variables of the indicators of teachers' competency in research universities under Jiangsu Province; mean, standard deviation (S.D.). For interpretation criteria about classifying mean score. The indicators of teachers' competency in research universities under Jiangsu Province was analyzed by Exploratory Factor Analysis (EFA), reduce unrelated variables. Phase 3: Mode, Median, Inter Quartile Range are used for data analysis.

5. Research Results

5.1 Demographic Information

Data analysis resulted according to Table 4.8 reveal that, the respondents in this studied 216 persons (56.39%) were male and 167 persons (43.61%) were females. When classified by age, the majority were over the age of 25-34 years, with 94 people or 24.54 percent and 35-44 years, with 123 people or 32.11 percent .45-54 years, with 101 people or 26.37 percent. 21-30 years, above 55 years, with 23 people or 6.00 percent. For Educational time with 1-10 years of experience, the total number of 125 persons (32.63%), 11-20 year of experience, there were 122 persons (31.85%) , the 21-30 year of experience, there were 74 persons (19.32%), the 31-40 year of experience, there were 20 persons (5.22%) The Professional title that with 82 persons (21.41%) were Teaching assistants and 180 persons (46.99%) were Lector, 55 persons (14.36%) were Associate professor ,14 persons (3.65%) were Professor. By qualification It was found that with 17 persons (4.43%) were at collages degrees level and 114 persons (29.76%) were Bachelor degree level, 166 persons (43.34%) were master degrees level ,44 persons (11.48%) were doctoral degrees level.

5.2 Reliability analysis of initial measurement

For reliability of questionnaire is a way of assessing the quality of the measurement procedure used to collect data. The researcher has sent out 30 questionnaires to collect data from non-samples in order to consider a result of reliability. Cronbach's alpha coefficient was at 0.986 above 0.80 means adequate reliability to determines the internal consistency or average correlation of items in a survey instrument to gauge reliability of the questionnaire. which can be used to describe the reliability of questionnaire.

5.3 Exploratory factor analysis

Through comprehensive analysis of the KMO value, variance interpretation rate, and factor load coefficients, etc.to verify the validity level of the data. Among them, the KMO value is used to evaluate the effectiveness of the data, and the variance interpretation rate value is used to illustrate the level of information extraction. The results of KMO value were 0.794, which indicates that the sample's adaptability is very good. Another test is the Bartlett's Test, which can be used to detect the independence between variables, and whether the correlation between variables was suitable for factor analysis. As a result, the approximate card value inspected by the Bartlett's Test, was 33871.488, the degree of freedom is 3160, and the significant level is 0.000. This result shows that the correlation between variables was significant.

Table 1 Data analysis results of the third part of the questionnaire-Squares Loading (n=383)

Factors	Extracted Sums of Squares Loadings			Rotation Sums of Squared Loadings		
	Eigenvalues	Percentage of Variance	Percentage of Cumulative	Eigenvalues	Percentage of Variance	Percentage of Cumulative
1	32.264	40.330	40.330	32.264	40.330	40.330
2	10.002	12.502	52.833	10.002	12.502	52.833
3	8.414	10.517	63.350	8.414	10.517	63.350
4	1.599	1.998	65.348	1.599	1.998	64.348
Extraction Method: Principal Component Analysis						

In this form, we could see that 4 main components (factor) were extracted, and each main factors had a corresponding extraction load square and rotating load square. It could be seen that the extraction load of the first main factor was 32.264, which accounts for 40.330% of the total difference, and the accumulated total difference was explained to 40.330%. For the second main ingredient, its extraction load square and 10.002, accounting for 12.502% of the total difference, and the accumulated total difference was explained to 52.833%. Based on this, each main ingredient had a corresponding extraction load square. The accumulated total difference was interpreted as 64.348%. factor analysis and principal component analysis were used to analyze the influencing factors. the rotated adopts the maximum variance orthogonal rotation method, with a total of 4 factors extracted fixedly. It was generally believed that the

total variance interpretation Factor extraction rate was greater than 60%, indicating sufficient information Has been extracted. The validity of the scale was considered to be good. It showed the factor loading and variables described in each of the main variables. Components behind the rotating shaft.

Table 2 Data analysis results of the third part of the questionnaire- summary

Order	Assembly	Number of variables	Factor load
1	Component 1	31	0.771-1.058
2	Component 2	27	0.535-1.021
3	Component 3	22	0.747-1.015
	All	80	0.535-1.058

According to table 2, there were 3 qualified components as follows;

Component 1 was described by 31 key variables. After rotation, on the shaft, the variable factor load in the component was between 0.771-1.058, with the maximum eigenvalue of 32.264, which could explain that the total variance was 40.330%. Compared with the variance of other components, it was found that this part was the most important, that was all 31variables were the best combination with the component. The maximum factor load of variable " I am used to making detailed plans first and then implementing specific work tasks " was 1.058. The variable " I can keep up with the subject trends and constantly learn and update my professional knowledge ", and the minimum factor loading was 0.771. Researcher named it " Basic quality".

Component 2 was described by 27 key variables. After rotation, on the shaft, the variable factor load in the component was between 0.535-1.021, with the maximum eigenvalue of10.002, which could explain that the total variance was 12.502%. Compared with the variance of other components, it was found that this part was the most important, that was all 31variables were the best combination with the component. The maximum factor load of variable " I think teaching can help students develop a new way of thinking in this subject" was 1.021. The variable "I often attend teaching seminars or workshops", and the minimum factor loading was 0.535. Researcher named it " Teaching ability ".

Component 3 was described by 22 key variables. After rotation, on the shaft, the variable factor load in the component was between 0.747-1.015, with the maximum eigenvalue of 8.414, which could explain that the total variance was 10.517%. Compared with the variance of other

components, it was found that this part was the most important, that was all 31variables were the best combination with the component. The maximum factor load of variable "I often use my spare time to focus on writing papers, writing textbooks, and applying for scientific research projects " was 1.015. The variable "The number of scientific research projects I had participated in the past year ", and the minimum factor loading was 0.747. Researcher named it " Research ability ".

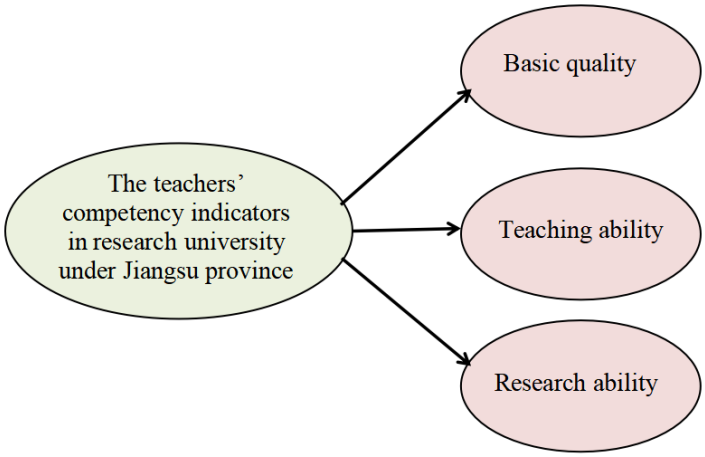


Figure 1 Showed the Component of teachers' competency indicators in research universities under Jiangsu province

5.4 Verify teachers' competency indicators in research universities under Jiangsu Province (Delphi)

(1) Content Analysis of Opinions from Expert Interviews on teachers' competency indicators in research universities under Jiangsu Province for the dimension of Core Competencies, Round 1

The Round 1 of open-end interview questions was guided by research questions. Respondents from 17 key informants were received by email, and 17 key informants' names returned the open-ended questions by email. The first interview round was completed within 3 weeks. The open-ended questions were used as a guide for the interviews. Some general open-ended questions would be submitted to in advance.

(2) Verifying teachers' competency indicators in research universities under Jiangsu Province in Round 2

The result of teachers' competency indicators in research universities under Jiangsu Province was a feasibility trend. Teachers' competency indicators in research universities under Jiangsu Province Median was found to be 5. When considering the list, there

was a base value in the Inter quartile Range of 0.00 from 17 expert. No .55, 59, 60, 64, 67, 70, 75, 76, 78, 79, 80 Inter quartile Range of 0.50. No.3,9,15. No.11, 14, 26, 27, 28, 35, 36, 42, 43, 46, 49, 65, 66, 68, 72, 73, 77 Inter quartile Range of 1.00. No.10, 12, 13, 19, 21, 22 Inter quartile Range of 1.50. It was acceptable for inter quartile range 0.00-1.50. Data trend concentration, with a skewed distribution.

Therefore, there were 3 important dimension of teachers' competency indicators in research universities under Jiangsu Province: Basic quality, Teaching ability, Research ability.

(3) To develop the model of teachers' competency indicators in research universities under Jiangsu Province.

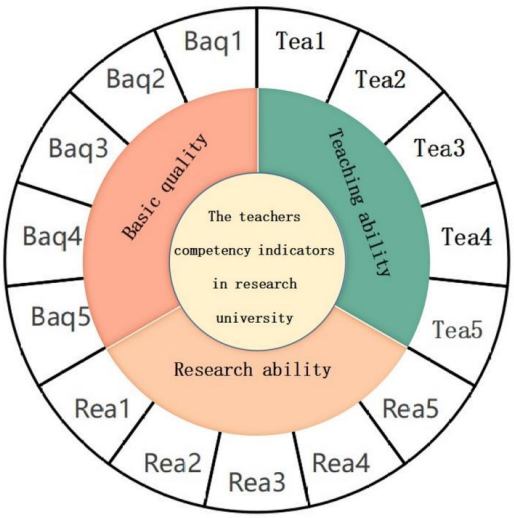
Based on the results of an analysis of the feasibility trends of teachers' competency indicators in research universities under Jiangsu Province of a group of 17 key informants, teachers' competency indicators in research universities under Jiangsu Province can use the analysis results to create a picture of the model. There were three dimensions as follows:

(1) Basic quality: there were 5 indicators.

(2) Teaching ability: there were 5 indicators.

(3) Research ability: there were 5 indicators.

Figure 2 The model of teachers' competency indicators in research universities under Jiangsu Province.



6. Discussion

The discussion will be presented as follows:

6.1 Discussion about major findings of objective 1

The first objective of the research was to explore the components of teachers' competency in research university under Jiangsu Province. The major findings revealed three components of teachers' competency in research university: Basic quality, Teaching ability, Research ability.

The major findings were revealed as such because teachers' Basic quality, Teaching ability, and Research ability are a key component of the teacher competency indicators. Through the collision of various factors and spiral progress, improve the overall level of research university teachers, so as to better guide students.

These research findings were in accordance with the theories or research of Chelo Moreno Rubio (2009:34-46) found that an effective teacher must be able to provide relevant and relevant tasks accompanied by an equitable assessment system. In addition, efficient teachers are responsible for creating a good school or educational environment that foster a passionate, motivated and interactive teacher-student relationship. It also involves caring for and responding to the needs of learners. Anna Maria Pesso a de Carvalho (2016:1-16), Alamgir Khan (2017:18-21), Adeleke Foluso Florence (2022:240-245) studied highlights the importance of teacher communication skills, and indicates that not only experienced but also inexperienced teachers need to constantly learn and improve this key skill. Marlene Edith Reyes Manrique (2016:17-30), Fareeda Ibad (2018:162-177), Nyoman Sugihartini (2019:306-310) believed that education is a comprehensive art that shapes people. To maximize the benefits of this comprehensive art, its cornerstone and engine are the qualities and abilities of teachers. ükran Tok (2010:4142-4146), Sariaman Gultom and Ahmad Fakhri Hutauruk (2020:1564-1569) found that by studying the level of teaching, educators can plan and implement the curriculum more effectively to meet the needs of different students and promote the acquisition and deeper understanding of knowledge. Trigwell, L.&Suzanne Shale (2004:18-24), David Blazar (2016:1-161) believed that over the past decade, research has confirmed that teachers have substantial impacts on their students' academic and life-long success.

6.2 Discussion about major findings of objective 2

The second objective of the research was to verify the teachers' competency indicators in research universities under Jiangsu Province. The teachers' competency indicators put forward a more comprehensive and practical competency indicators to develop the teachers' competency indicators in research universities under Jiangsu Province.

The teachers' competency indicators in research universities under Jiangsu Province,

there were total 15 competency indicators. The major findings were revealed as such because the good learning ability, good communication and teamwork skills, strong information search ability, good observation and insight , the ability to analyze the problems, affinity and have a harmonious relationship with the students, good organizational skills, advanced educational concepts, solid academic background, good scientific ethics, good scientific ethics, the spirit of dedication to scientific research , good critical thinking , persistence and focus of the research , innovative thinking.

These findings were in accordance with the theories or research of Lin Lijie (2007:230-234) , Wang Yu, Dai Liangtie, Xiong ke (2006:120-122) which was found that the views proposed are consistent. Leng Jiaqing (2018:68-72), Nie Shaoqun (2017:89-92), Mwiya DB (2017:1044-1098), W Wahyuddin (2016:102-128) Zhu Jianliu (2016:34-51), Wang Jinyou (2014:127-136), Gao Yingbin (2013:190-193) believed that the basic quality to ensure that teachers can interact more effectively with students, parents, and colleagues, so as to improve the quality of teaching and students' learning experience. These basic qualities together constitute the educational foundation of a teacher and help them to perform their educational work effectively. Eric Hoyle (2012:76-88), Wang Xiaolong (2011:3-45), Liu Yeyu (2008:147-169), Song Qian (2008:21-23), Xie Heping (2008:4-9), Lin Lijie (2007:230-234), JM Bartunek (2006:9-15) found that teacher's teaching ability able to great significance for the long-term development of the education system and the society. Shi K (2006:586-595), Tigelaar D E H (2004:253-298), Gerard Kaspal (2002:57-69), Mcber H (2000:58-67), Sandbe Jorgen (2000:9-17), Martin Finkelstein (1998:135-168) found that research abilities help to enhance teachers' sense of value and dignity towards their profession, making them more motivated and satisfied to achieve higher level educational goals.

7. Recommendations

7.1 Recommendations for Policy Formulation

The investigators believe that the suggestions for policy making can be discussed based on the following three dimensions:

(1) Basic ability dimension:

a. Develop comprehensive quality standards: The government and schools can formulate clear comprehensive quality standards, covering communication skills, teamwork ability, leadership and other aspects, to guide the development of teachers.

b. Establish a comprehensive quality training system: set up a comprehensive

quality training program, provide courses and training to help teachers improve their basic abilities, including speech skills, interpersonal relationship, conflict management, etc.

c. Encourage cross-field training: Promote teachers to participate in cross-field training and develop interdisciplinary competence to better adapt to the changing academic and social needs.

(2) Teaching ability dimension:

a. Promote teaching innovation: Formulate policies to encourage teachers to explore innovative teaching methods, such as problem-oriented teaching, flipped classroom, etc., to improve teaching effects.

b. Provide teaching and training resources: establish a teaching and training resource database, provide training materials in teaching design, textbook compilation, classroom management and other aspects, to help teachers continuously improve their teaching ability.

c. Establish a teaching evaluation system: establish a comprehensive teaching evaluation system, including student evaluation, peer review, etc., to encourage teachers to constantly improve their teaching methods.

(3) Research ability dimension:

a. Encourage scientific research project application: formulate policies to encourage teachers to actively participate in scientific research project application, provide scientific research funds and resource support, and promote the development of scientific research activities.

b. Establishment of scientific research cooperation fund: establish scientific research cooperation fund, encourage teachers to carry out interdisciplinary and cross-school cooperation, and promote the implementation of innovative scientific research projects.

c. Support the transformation of scientific research achievements: formulate policies to support teachers to transform scientific research achievements into practical applications, such as technology transfer and entrepreneurship support, so as to enhance the social influence of scientific research.

In conclusion, research based on different dimensions can provide guidance for policy makers, provide suggestions on practical applications for schools and teachers, and continue to explore more segments in future research to better promote the all-round development of teachers in research universities in Jiangsu Province.

7.2 Recommendations for practical application

Based on the study of Jiangsu Province, the results can be applied to the following fields or institutions:

(1) University education management: The research results can provide the basis for teacher training, development, selection and evaluation in colleges and universities, and optimize the structure and quality of teachers.

(2) Teacher training institutions: The research results can design training courses and contents for teacher training institutions to help teachers improve their basic quality, teaching ability and scientific research ability.

(3) Government education authorities: the research results can provide reference for the government to formulate higher education policies, promote the all-round development of university teachers, and improve the quality of education.

(4) Educational research institutions: The results can provide data support for educational research institutions' in-depth discussion of teacher development paths, educational policies and educational reform.

(5) Academia and academic communities: The results can provide an empirical basis for academia to explore topics such as teacher career development, academic innovation, and interdisciplinary collaboration.

In conclusion, these research results can be applied in many fields and institutions, including higher education management, education training, government policy making, and academic research, to support the comprehensive development of research university teachers and improve the quality of education.

7.3 Recommendation for Further Research

After two rounds of Delphi analysis, through data analysis, from three dimensions to determine the 80 ability project, to verify the research university in Jiangsu province teachers provide foundation, for the research university of Jiangsu province screening, training, improve teacher’s competent factors provide significance, also for the future direction for the development of the following aspects of thinking:

(1) In-depth discussion of factors: to further deepen the dimensional analysis of the basic ability, teaching ability and scientific research ability, and to explore the correlation between different factors, and their influence in different backgrounds.

(2) Longitudinal follow-up study: a long-term follow-up study of teachers 'competence factors, to understand the development trajectory of teachers at different stages of their career, and to provide more detailed guidance for teachers' career development.

(3) Research on influencing factors: explore the influence of external factors on teachers 'competence factors, such as policy changes, social environment, etc., so as to deepen the comprehensive understanding of teachers' ability development.

(4) Education policy research: explore the influence of education policy on the development of teachers 'competence factors, and analyze the guiding role of policy formulation on teachers' career and ability cultivation.

(5) Research on education quality evaluation: explore the relationship between teachers' competence factors and school education quality, to provide more scientific basis for education quality evaluation.

(6) Exploration of education reform: Based on the research of teachers' competence factors, explore the direction of education reform to meet the needs of education in the new era, and promote the innovation and development of college education.

In short, the future research direction should explore the development of the competence factors of teachers in research universities in Jiangsu Province from a deeper and broader perspective, so as to provide more specific and practical suggestions and guidance for the development of higher education. At the same time, interdisciplinary cooperation, education policy research and education quality evaluation and other areas are also worthy of further research direction.

BIbliography

Abdelhady Elnagar. (2021). **International Education and the Internationalization of Public Schooling in Canada: Conceptualizations and Approaches.** Canadian Journal of Educational Administration and Policy. 2021, 80-94.

Alamgir Khan, Salahuddin Khan. (2017). **Communication Skills of a Teacher and Its Role in the Development of the Students' Academic Success.** Journal of Education and Practice, 2017(1): 18-21.

Cheng Lisi. (2017). **Research on the open construction of primary and secondary school teachers.** University Of Hebei, 2017: 1-64.

David Blazar. (2016). **Teacher and Teaching Effects on Students' Academic Performance, Attitudes, and Behaviors: Extensions of the Literature.** the Graduate School of Education of Harvard University. 2016, 1-161.

Gao Yingbin. (2013). **Discussion on the classified management mode of "three functions in one" university teachers.** Human Resources Management, 2013 (10): 190-193.

Kıymet Selvi. (2016). **Teachers' Competencies.** International Journal of Philosophy of Culture and Axiology, 2016, 7(1): 167-175.

Liu Xiangjie. (2019). **Construction of the index system of the comprehensive ability evaluation of higher vocational professional teachers.** Journal of Hunan Industrial Vocational and Technical College, 2019, 19(04): 107-112.

Nie Shaoqun, Xiong Qi, Li Tiebin. (2017). **Empirical study on the relationship between the characteristics and job performance of university teachers in Jiangxi Province.** Journal of Gannan Normal University, 2017, 38 (1): 89-92.

Teachers' Council of Thailand. (2018). **The Southeast Asia Teachers Competency Framework (SEA-TCF).** 2016,1-43.

Wang Jinyou, Pu Shilu. (2014). **Analysis of the classified management of university teachers from the perspective of the reform of the personnel management system of modern universities.** China University Teachers Research, 2014 (1): 1-6.

Wang Jinyou, Pu Shilu, Tu Huimin, Li Ni. (2014). **On the classification management of university teachers' positions -- the experience of foreign universities and the practice of business schools in China.** Journal of Sichuan University (Philosophy and Social Sciences Edition), 2014 (2): 127-136.

Wang Xiaolong. (2011). **Thoughts on the reform of personnel management system in colleges and universities.** Heilongjiang Higher Education Research, 2011,3): 43-45.

Zhang Leping, Liu Jiajia. (2023). **Comprehensively improve the quality of independent training of high-level talents: the role, response and guidance of research universities in the new era.** The Journal of Higher Building Education, 2023:1-11.

Zeng Xiaodong. (2004). **Sorting out the performance evaluation process of primary and secondary school teachers.** Research on Teacher Education, 2004 (1).