FACTOR ANALYSIS OF COMPETENCIES OF TEACHER PERFORMANCE IN SECONDARY SCHOOLS IN SVAY RIENG PROVINCE, CAMBODIA

Kim Dimanchetra[1], Methee Wisaprom[2]

[1]MEd in Educational Research and Evaluation, Faculty of Education, Sisaket Rajabhat University, Thailand
(Email address: kimdimanchetra168@gmail.com)

[2]PhD, Division of Research and Evaluation, Faculty of Education, Sisaket Rajabhat University, Thailand
(Email address: methee07g@gmail.com)

ABSTRACT

The purpose of this research study was to develop the index of competencies of teacher performance and to validate the competency model of teacher performance. 700 school principals, deputy directors, specialized team leaders, and teachers who were teaching at upper and lower secondary schools in Svay Rieng in the 2008 academic year were selected from 23 secondary schools in Svay Rieng. The questionnaire form was used as research instrument. The content analysis and confirmatory factor analysis were conducted for the two objectives. The results revealed that the model was composed of eight factors with 40 variables and the model fitted the empirical data with a chi-square of 1235.80 on 732 degree of freedom; a p-value of 0.00; a goodness of fit index (GFI) of 0.92; an adjusted goodness of fit index (AGFI) of 0.91; a comparative fit index (CFI) of 0.90; a standardized root mean square residual (Standardized RMR) of 0.044; and a root mean square error of approximation (RMSEA) of 0.031.

KEY WORDS: Factor analysis, Competency, Teacher Performance.

1. INTRODUCTION

Throughout the educational systems in the world, few problems had obtained more concentration than the issues of guaranteeing that elementary and secondary school classrooms were all supplied with sufficiently qualified teachers (OECD, 2005; & Mullis, et al., 2003). More recently, very significant attention had been provided to policies that govern the support of quality of teachers. Intense discussion, along with legislative initiatives, had concentrated on the need for nationwide standards in authorized test, on the quality of teacher education programs, on effective methodologies in teaching, on academic needs, on employing and permanence practices, and on induction programs (Wang, et al., 2003). However, some of these problems had been seen as an original cause or possible resolution to inadequate teacher quality and consequent student

performance. Similarly, Korea had also viewed a strange concern in teachers as the most significant component affecting student success, which brings in a conclusion that teachers' quality should be developed in order that the quality of education will be raised (Kim, 2007).

Education is an importance criterion that helps develop the nation. Satisfactory educational management with high quality in the country improvement up to the opulence, economical achievement, developed society, stable politic, well-known culture, and technological improvement, significantly had to rely upon teachers (Noiphrom, 2010). This is because teachers play important duty in each and every aspect of the learning development. Furthermore, according to the Basic Education Curriculum of Thailand (2008), the educational institutes also had much responsibility to pay for the research in improving the teaching and learning through the educational administration in the connection with the curriculum performance that is suitable to the principle, the purpose, and the required project (Ministry of Education of Thailand, 2008). Hence, there should be a significant difference between the arrangement and the performance in coincidence with the effectiveness, the interest, and the students' needs. The educators had to combine the employment of the research procedure of the pedagogy for the quality development and students' abilities. The process of the research could be used as portion of learning procedure accompanying with stages of the problem analysis, the planning to solve or to enhance, the collaboration to develop or solve, the data collection, the conclusion on the problem solution, report on the learning results, and the application of the research outcomes (Ministry of Education of Thailand, 2005).

Not different from other countries in the world, Cambodia had also spent much more concern to higher education quality as well as to teachers' quality. The Royal Government of Cambodia (RGC) and the Ministry of Education, Youth, and Sport (MoEYS) had currently been trying to reach a long-term vision in order to establish and improve human resources of the highest quality and standards of ethics who have competencies in developing a knowledge-based society in Cambodia (MoEYS, 2014 &Chan, 2014). Extensive experience views that a long-term education is a determinant and a factor of socio-economic development as well as human development. A knowledge-based society that associated with good health of people brings a country with a creative and talented workforce for powerful and steady economic development. Furthermore, movement to qualitative education and successful educational capacity, especially among youth, who created the foundation of future development and growth, were very significant destinations for themselves. Education not only leads to income growth and helps encourage people, but it also provides learners the opportunities to obtain benefit of economic, social, and political growth; and puts individual in authority of their own goals by guiding them into a better life enjoyment (Sothy, et al 2015).

In order to enhance and develop teacher quality, Ministry of Education, Youth, and Sport, had set up a program called continuous teacher development. The teacher development program had an objective to secure an effective support of basic cycle teachers and teachers with bachelor degree who had opportunities to adapt for system development including training and upgrading of Teacher Training College (TTC) and education managers, National Institute of Education (NIE) trainers, school directors and other key MoEYS personnel (MoEYS, 2005). Another objective was to guarantee that TTC and NIE acceptance and subsequent trained teacher improvement reply to the rising needs in rural or remote areas and in difficult areas throughout the enrollment of new teacher

trainees from those areas and ethnic minority areas. The other objective was to raise the teaching quality through enlargement of in-service teacher training provision. This not only improve teacher quality or teaching competency but it also a good way to enhance educational system and student achievement as well.

Teachers' competencies are very significant factors predicting, expecting and producing the qualities for learners. Therefore, teachers must be able to give knowledge to students on purpose in accordance with educational methodologies. Teachers need to devote themselves in their profession and be ready to develop own selves to become professional instructors in all aspects of teachers with high competency. In order to get this, they must search for knowledge, skills, experiences, and strong instructional process, with a good behavior, and have to perform their duties through teaching pedagogy and do research related to their teaching competencies and as well as general knowledge and technological skills.

2. LITERATURE REVIEW

2.1. Teacher Performance

The concept "teacher performance" has to be avoided from ineffective motivations, an evaluation system disconnected to classroom realities, and a shortage of chance to learn and share best-practice lessons with colleagues (Tandon and Fukao, 2005). The ability of a teacher to bring in positive changes in the students' behavior, which results in student achievement, is called teacher performance (Teel, 2003).

Teacher performance really has influences on and relationship between the school inputs and student learning results from the perspective of economy, in the mean of searching for the effects of educational outgoings on student success. Meanwhile, teacher performance is also affected by teaching experiences and educational level as the above two types of school input variables. Furthermore, it looks for the common relationship between these variables and student success (Zhang, 2008).

2.2. Competency

The word "competency" refers to a related set of knowledge, skills, and attitudes that enable a person to effectively perform the activities of a given occupation or function in such a way that meets or exceeds the standards expected in a particular profession or work setting (Spector & Teja, 2001 and Smith, 2008). The word competence and competency can be utilized interchangeably, and it is stated that competency expression is more extensively used in the education area. Competency is identified as the application of knowledge, technical skills, and personal characteristics that lead to outstanding performance. Competency is defined as a basic characteristic of the worker that ensures his or her effective and high performance (Dubois & W. Rothwell, 2000 and Orazbayeve, 2016). The same as the qualities that people should have and use to reach their goals more effectively, the "competencies" embrace the knowledge, individual skills, ways of thinking and mentality, social functions, self-perception, thoughts, etc.

2.3. Overview of Factor Analysis

Factor analysis is the technique that uses mathematical procedures for the simplification of interrelated measures to discover patterns in a set of variables (Child, 2006). Discovering the simplest method of interpretation of observed data is called parsimony, and it is known as the main aim of factor analysis (Harman, 1976). Factor analysis is used in many areas such as behavioral and social sciences, medicine, economics, and geography as an output of the technological advancements of computers (Yong and Pearce, 2013).

Factor analysis is the analytical technique to reduce the set of measured variables to a smaller set of underlying factors that account for the pattern of relationships (Tinsley & Tinsley, 1987). This reduction of the number of variables serves to make the data more manageable and interpretable.

To describe unique variance most successful, the researcher is able to use factor analysis in developing theory through two different techniques. The two main factor analysis techniques are Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). EFA attempts to uncover complex patterns by searching dataset and testing predictions, whereas CFA tries to confirm hypotheses and uses path analysis diagrams to represent variables and factors (Child, 2006).

The Exploratory Factor Analysis exist several analytical models and results differently; the researchers prefer to use Confirmatory Factor Analysis instead of it (Wonpeng, 2009). Thus EFA has initial agreement that is strict and does not reflect reality. CFA has three objectives such as: to test theory used as the basic of factor analysis; to explore and specify factors; and to use as an instrument to develop new variables. Yet, this CFA technique can be used to analyze data having initial agreement less than EFA technique. For example, the discrepancy may be related.

Confirmatory factor analysis has been used more and more these days, because there are several computer programs which make it easier to analyze and thus Exploratory Factor Analysis has got much critic. stated that searching for appropriated knowledge for factor analysis does not have reasonable method that extracts knowledge irrelevant to initial source definitely (Mulaik, 1987).

3. RESEARCH METHODOLOGY

This research study focused on the study of the components of competencies of teacher performance and the validation of the index of competencies of teacher performance in secondary schools in Svay Rieng province, Cambodia. This research study was about confirmatory factor analysis which aimed to study the factors of competencies of teacher performance in secondary schools. The researcher defined the research procedures as follows:

3.1. Research Sample

The group of sample was selected from this population through sampling technique and for its purpose. This research study was concerned with confirmatory factor analysis. In this case, the sample size should be large enough for the analysis. Normally, the sample size should be at least five times as large as the number of variables to be analyzed; but to be more acceptable; it should be at least ten times as large as the number of variables being used in the research (Hair, Black, Babin,

& Anderson, 2010). In this research study, since 68 sub-dimensions (index) were constructed and used within the research instrument, the researcher selected 700 participants.

3.2. Research Instrument

The research instrument was a questionnaire about the competencies of teacher performance. The questions were constructed to cover all competencies which derived from reviewing the previous literature and related research studies. The questions were divided into two parts. Part 1 represented demographic information and background including gender, age, degree level, work experience, current position, and work place (type of school). All of these were in a checklist. Part 2 referred to the competencies on teacher performance in secondary schools in Svay Rieng province, Cambodia. They were in 68 items with five rating scales including the most, much, moderate, less, and the least. The content validity was carried out to examine item objective congruence (IOC) of the question items and performance which was at .80-100. Only 48 variables from the list were accepted to be used for further process. The discrimination used to check item total correlation was at .99 and the reliability of the questionnaire was at .95. Finally, eight competencies and 40 items were used in completed questionnaire for data collection.

4. RESULTS

4.1. Descriptive Statistics of the Sample

The researcher collected data from the sample of 700 teachers, deputy directors, and school principals in upper and lower secondary school in Svay Rieg province with the demographic information of the respondents of the research study such as: sex, age, degree level, work experience, position, and work place.

Table 1: Frequency and percentage of the respondents in terms of demographic data

Variables	Description	Respondents	Percentage (%)
Sex	Male	467	66.70
	Female	233	33.30
Age	Under 30	113	16.14
	30-39	262	37.43
	40-49	245	35.00
	50-59	80	11.43
Degree Level	Below Bachelor	312	44.57
	Bachelor	356	50.86
	Master	30	4.29
	Doctor	2	0.28
Work Experience	Less than 10	44	6.29
	10-19	86	12.29
	20-29	228	32.57
	More than 30	342	48.85

Position	Teacher	495	70.70
	Team leader	151	21.60
	Deputy director	42	6.00
	School principal	12	1.70
Work Place	Upper Secondary	460	65.70
	Lower Secondary	240	34.30

As can be seen from Table 1 provided background characteristics of respondents. Seven hundred secondary school teachers completed fully the questionnaire survey. Nearly half 66.70% of the respondents were male whereas 33.30% of them were female. The respondents between 30 and 49 were in the most number of 72.43% whereas 27.57% of them were lower than 30 and over 50 years of age. Mostly of the respondents 95.43% had an educational background in bachelor and below where a few of them 4.57% had a higher degree. The respondents with a longer experience more than 20 years were in the most number whereas a few were in lower experience. The respondents of teachers 70.70% replied the questionnaire much more than the others. Mostly of the respondents 65.70% were from upper secondary school whereas 34.30% of them were from lower secondary school.

4.2. Factor Analysis of Competencies of Teacher Performance

The result for factor analysis for this measure yield an eight factor solution such as: 1) competency of planning and preparation; 2) competency of classroom environment; 3) competency of instruction; 4) competency of technological skills; 5) competency of feedback; 6) competency of professional responsibilities; 7) competency of professional characteristics; and 8) competency of professional development.

Table 2: Descriptive statistics of variables used in analysis of competencies of teacher performance in secondary schools

Variables	Mean	S.D	CV(%)	Skewness	Kurtosis
1. include new knowledge into existing knowledge	3.613	0.540	0.149	0.060	-0.981
2. determine the amount of time necessary for instruction to take place	3.479	0.536	0.154	0.449	-1.047
3. develop plans to meet the needs of diverse students into the classroom	3.574	0.550	0.134	0.222	-0.971
4. plan instructions based on knowledge of students and curriculum goals	3.657	0.526	0.144	-0.123	-0.899
5. relate ideas and information to the content	3.733	0.654	0.175	0.277	-0.655
6. select strategies to engage all students in learning	3.644	0.610	0.167	0.154	-0.447

7. demonstrate effective classroom management and classroom procedures	3.363	0.655	0.195	-0.020	-0.248
8. respect individual differences among learners	3.320	0.640	0.193	-0.174	-0.438
9. create an environment of respect and rapport	3.329	0.664	0.199	0.133	-0.105
10. create and maintain a safe and purposeful learning classroom climate for all students	3.416	0.700	0.205	0.076	-0.209
11. use instructional time effectively to maximize student learning	3.803	0.575	0.151	0.029	-0.284
12. connect students' prior knowledge, life experience, and interest in the instructional process	3.724	0.540	0.145	-0.089	-0.479
13. employ effective instructional strategies	3.697	0.566	0.153	0.085	-0.592
14. use correct spoken and written language throughout instruction	3.709	0.569	0.153	0.089	-0.557
15. give clear directions and procedures specific to the lesson activities	3.727	0.544	0.146	-0.066	-0.466
16. facilitate high level of student participation in the discussion	3.657	0.607	0.166	0.342	-0.660
17. have the knowledge of internet search and research	2.921	0.559	0.191	-0.026	0.141
18. compose and check email and know how to attach files to an email	2.854	0.694	0.243	0.229	-0.830
19. be able to download files from the internet	2.983	0.754	0.253	0.108	-1.019
20. know how to use Microsoft Offices for teaching	2.914	0.761	0.261	0.262	-0.898
21. give students feedback to encourage them to have more responses	3.790	0.576	0.152	0.043	-0.330
22. give students positive and specific feedback on every task	3.777	0.557	0.147	-0.025	-0.281
23. have a conversation with each student and let them talk about their mistakes	3.624	0.569	0.157	0.227	-0.764
24. be happy to give positive feedback	3.744	0.580	0.155	0.097	-0.375
25. look for good chances to give feedback	3.677	0.567	0.154	0.122	-0.650
26. effectively manage and implement program for student protection	3.686	0.594	0.161	-0.133	-0.163

27. be responsible, honest, integrate, and fair on own work at all times	3.457	0.586	0.169	-0.197	-0.542
28. use school resources economically	3.459	0.588	0.170	-0.008	-0.468
29. participate with colleagues to share and plan for student success	3.703	0.629	0.170	-0.401	0.275
30. enjoy teaching	3.541	0.568	0.160	0.446	-0.773
31. be warm, accessible, enthusiastic, and caring	3.404	0.557	0.164	0.982	-0.052
32. be a skilled leader	3.751	0.562	0.150	0.011	-0.396
33. maintain professionalism everywhere	3.391	0.594	0.175	1.247	0.523
34. have strong commitment to develop instructional methodologies	3.779	0.564	0.149	0.004	-0.308
35. have informal dialogues to improve teaching	3.367	0.541	0.161	1.114	0.223
36. have observation visits both in own school or in other schools	3.419	0.581	0.170	1.042	0.090
37. strengthen general knowledge	3.330	0.509	0.153	1.144	0.183
38. connect own life into everyday life of school and other teachers	3.694	0.601	0.163	0.249	-0.623
39. offer opportunities for self-reflection and learning from experience	3.643	0.601	0.165	0.348	-0.668
40. encourage and support innovation and collaboration	3.726	0.625	0.168	0.278	-0.648

As can be seen from Table 2, the competencies of teacher performance in secondary schools in Svay Rieng province with eight factor and 40 variables had mean scores ranging from 2.854 to 3.803. Each variable had mean scores and standard deviation with similar number. Descriptive statistics in table 4.2 also provided some information about the standard deviation values (as a measure of dispersion). All standard deviation values (for variables from 1 to 40) were between 0.509 and 0.700 and indicated that the data are normally distributed and less concentrated around the mean and more spread. Some information concerning the distribution of scores (skewness and kurtosis) is also shown in table 2. These values are visually inspected and the results were as follows: most skewness values were positive and close to zero with values between 0.004 and 1.247, which shows a very slight skew to the left hand side. Meanwhile, skewness of variables 4, 7, 8, 12, 15, 17, 22, 26, 27, 28, and 29 were negative and close to zero with values between -0.401 and -0.008, which shows a very slight skew to the right hand side. Additionally, all the kurtosis values (except variables 17, 29, 33, 35, 36, and 37) were negative and roughly close to zero with values between -1.047 and -0.052 which shows very slight flat shape with very few cases at the extreme.

4.3. Second Order Confirmatory Factor Analysis of the Competencies of Teacher Performance

The results of second order confirmatory factor analysis of competencies of teacher performance in secondary schools were defined as 8 explicit factors with 40 variables as follows:

Table 3: Second Order Confirmatory Factor Analysis

Competencies	Factor loading		t	R^2
	β	b (SE)		
Planning and Preparation (6 variables)	0.74	0.09	7.82**	0.55
Classroom Environment (4 variables)	0.30	0.07	4.01**	0.09
Instruction (6 variables)	0.80	0.10	8.33**	0.64
Technological Skills (4 variables)	0.16	0.06	2.51**	0.02
Feedback (5 variables)	0.74	0.08	9.68**	0.54
Professional Responsibilities (4 variables)	0.66	0.08	7.94**	0.43
Professional Characteristics (5 variables)	0.56	0.20	2.81**	0.32
Professional Development (6 variables)	0.46	0.12	3.67**	0.21

As can be seen from Table 3, the model of competencies of teacher performance in secondary schools in Svay Rieng province fitted the empirical data with a chi-square of 1235.80 on 732 degrees of freedom and a p-value of 0.00, a goodness of fit index (GFI) of 0.90, an adjusted goodness of fit index (AGFI) with value of 0.91, a comparative fit index (CFI) of 0.90, a standardized root mean square residual (Standardized RMR) of 0.044, and a root mean square error of approximation (RMSEA) of 0.031.

The eight factors were importance to ensure the competencies of teacher performance in secondary schools as their factor loading were statistically significant at the .01 level with the range from 0.16 to 0.80. The factor with the highest factor loadings was competency of instructions (0.80) and followed by competency of planning and preparation and competency of feedback with factor loadings of 0.74; competency of professional responsibilities with factor loadings of 0.66; competency of professional characteristics with the factor loadings of 0.56; competency of professional development with factor loadings of 0.46; competency of classroom environment with factor loadings of 0.30; and the lowest factor loadings was the competency of technological skills with factor loadings of 0.16. All the factor loading shared covariance with the competencies of teacher performance in secondary schools at the levels of 64%, 55%, 54%,43%, 32%, 21%, 9%, and 2% respectively.

5. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The purpose of this study was to study the model of index of competencies of teacher performance in secondary schools and to validate the model of index of competencies of teacher performance

with the empirical data. The sample size of this research study was 700 school principals, deputy directors, and teachers who were teaching at upper and lower secondary schools in Svay Rieng province in Cambodia.

The related research studies and literature review were conducted so as to construct the model of competencies of teacher performance in secondary schools in Svay Rieng province, Cambodia. As a result, a model of 8 factors with 40 variables was developed. According to the confirmatory factor analysis results, it was a suitable model for competencies of teacher performance.

The results also demonstrated that the model of index of competencies of teacher performance with eight competencies and 40 observed variables were important to ensure the competencies of teacher performance as their factor loading were positive and statistically significant at the level .01 with the range from 0.15 to 0.82. The model measurement used in this factor analysis consisted of eight competencies such as: 1) competency of planning and preparation; 2) competency of classroom environment; 3) competency of instruction; 4) competency of technological skills; 5) competency of feedback; 6) competency of professional responsibilities; 7) competency of professional characteristics; and 8) competency of professional development. Among all competencies were in the good fit of the empirical data.

Recommendations

The results of this study can give several significances to both school principals and teachers.

For School Principals

School principals in each school should pay more attention to the process of learning and teaching, especially on the quality of teachers in every fields such as planning and preparation for the lesson; the ways teachers organize the class; what teaches knows about technologies; and other related criteria. School principals also need to find ways to give them opportunities to join workshop or encourage them to do research on their own.

For Teachers in Lower and Upper Secondary Schools

The teachers in lower and upper secondary schools should learn about themselves, find out what are their strengths and weaknesses, and spend time improve their weaknesses. Teachers should adopt new and different teaching techniques for their classes. Teachers should not only prepare and plan the lessons well, also they need to strengthen the technological knowledge and do researches on both own subject knowledge and general knowledge. Teachers should know the variety of knowledge and skills so that they can provide knowledge to learners easier and gain more success from them.

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