

A Confirmatory Factor Analysis of a Model for Creative Academic Administration for Early Childhood Level of Schools under the Office of the Basic Education Commission in Thailand

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Abstract-The purpose of this research was to study the components and analyze confirmation factors of a model of the Creative Academic Administration for Early Childhood level of schools under the Office of the Basic Education Commission in Thailand. There were 324 samples including directors, deputy directors and teachers working on academic affairs for early childhood level. The samples were selected using multi-stage sampling technique. The tool used for data collection was a 5-level rating scale questionnaire with an Index of Item-Objective Congruence (IOC) of 0.60-1.00 and a reliability of 0.976. The data was analyzed using Second-order of Confirmatory Factor Analysis (CFA). It was found that there were 6 main factors of the Creative Academic Administration for Early Childhood level of schools under the Office of the Basic Education Commission in Thailand. The 6 main factors included the development of early childhood creative curricula level, the development of early childhood creative learning processes level, the creative research for the development of early childhood education, the development of early childhood creative media and technologies level, the development of early childhood learning creative resources and atmospheres level and the development of early childhood creativity measurement and evaluation of education level. The results obtained from confirmatory factor analysis indicated that the factors were corresponded with the empirical data based on the empirical Chi Square statistics, $\chi^2 = 7.29$, $df = 5$, $P\text{-value} = 0.20028$, $RMSEA = 0.038$, $GFI = 0.99$, $AGFI = 0.97$, $RMR = 0.0014$, $CFI = 1.00$, $NFI = 1.00$ and $CN = 670.90$. The six factors had standard factor loadings between 0.34 - 0.55. The factor loadings of sub-factors ranged from 0.38 to 0.61.

Keywords: Creative Academic Administration, Early Childhood Academic Affairs, Early Childhood Education Administration

I. INTRODUCTION

Changing in economic, information technology development plus the 12th National Economic and Social Development Plan (2017-2021), National Education Plan

(2017-2036), Early Childhood Strategic Plan (2017-2021) have led to policies and goals to develop early childhood to catch up with the changing world.

Early childhood education is very important work because it deals with the early stage of learners. This early stage of life is a crucial stage for development of innovative thinking [1]. Innovative skill cannot emerge by itself. It has to be activated [2].

Characteristics of innovative person are absorbing knowledge, thinking in different ways, ability to improve or modify things which lead to new innovations [3].

Thus, early childhood education development has to be based on care taking and learning process development which related to nature and age of each learner under social and cultural context. This can lead to good base for good quality of individual life, family, society and also the country. Based on the philosophy of education for early childhood 2017, in order to reach the goal of Early Childhood Education, Administrators have to focus on academic administration. Administrators have to understand the concepts and models for education management based on the National Education Act 1999, revised in 2002 and manage to reach the goal of education according to the context of schools.

Therefore, the researcher was interested in developing a model of the Creative Academic Administration for Early Childhood level of schools under the Office of the Basic Education Commission by analyzing confirmation factors of a model of Creative Academic Administration for Early Childhood level of schools. The model could be a prototype for Academic Administration in schools in order to develop the quality of early childhood level education.

II. OBJECTIVE

To study the component levels and analyze confirmation factor of a model of Creative Academic Administration for Early Childhood level of schools under

the Office of the Basic Education Commission in Thailand.

III. CONCEPTUAL FRAMEWORK

The researchers established a conceptual framework for this research by studying theory concepts related to Academic Administration for Early Childhood level in order to examine the congruence of a model. The concepts obtained by synthesizing the various concepts of educators, academics and researchers including [4], [5], [6], [7], [8], [9], [10]. The researchers found 6 factors for Creative Academic Administration for Early Childhood level including 1) the development of early childhood creative curricula level; 2) the development of early childhood creative learning processes level; 3) the creative research for the development of early childhood education; 4) the development of early childhood creative media and technologies level; 5) the development of early childhood learning creative resources and atmospheres level and 6) the development of early childhood creativity measurement and evaluation of education level.

IV. RESEARCH SCOPE

Population and sample

Total population was 5,424 people including 2,712 administrators and 2,712 teachers working in early childhood level in schools under the Office of the Basic Education Commission.

Samples in this research were 350 administrators and teachers responsible for academic affairs in early childhood level. Multi-stage random sampling technique was used to choose the samples. The number of sample was based on [11], who stated that the sample size should be 350 or higher when the factor loading is from .30 or higher.

Variables

The variables in the research on Creative Academic Administration for Early Childhood level consisted of 1) the development of early childhood creative curricula level; 2) the development of early childhood creative learning processes level; 3) the creative research for the development of early childhood education; 4) the development of early childhood creative media and technologies level; 5) the development of early childhood learning creative resources and atmospheres level and 6) the development of early childhood creativity

measurement and evaluation of education level. The Creative variables consisted of 1) flexibility 2) vision 3) imagination 4) motivation and 5) new problem solving methods

V. RESEARCH TOOLS

The research tool used in this study was a 5-level rating scale questionnaire. It was divided into 2 parts.

Part 1 was a 5 question-checklist form collecting general information of the informants.

Part 2 emphasized the perspectives of the informants on the factors enhancing the success of the Creative Academic Administration for Early Childhood level of schools under the Office of the Basic Education Commission. It consisted of 6 factors including: 1) the development of early childhood creative curricula level; 2) the development of early childhood creative learning processes level; 3) the creative research for the development of early childhood education; 4) the development of early childhood creative media and technologies level; 5) the development of early childhood learning creative resources and atmospheres level and 6) the development of early childhood creativity measurement and evaluation of education level.

The questionnaire had consistency index between 0.60-1.00. The reliability of the instruments with a Cronbach's Alpha Coefficient analysis of 0.976.

Data collection and analysis

Data collection

1. Data collection was carried out by posting total of 350 questionnaires to selected samples
2. Researchers checked the number and the completion rate of the questionnaires. The total number of completed questionnaires was 324 (92.57%).

Data analysis

Data analysis was carried out using a computer program to analyze the following statistics.

1. General information of the informants was analyzed using descriptive statistics including frequency and percentage.
2. Confirmatory Factor Analysis (CFA) was used to examine the congruence of the model of Creative Academic Administration of Early Childhood level in schools under the Office of the Basic Education Commission in Thailand with the empirical data.

VI. RESULTS

1. The results of factor analysis of the six factors for Creative Academic Administration of Early Childhood level of schools under the Office of the Basic Education Commission in Thailand were as follow.

Factor 1: The development of early childhood creative curricula level had 16 variables, a1-a16

Factor 2: The development of early childhood creative learning processes level had 14 variables, b1-b14

Factor 3: The creative research for the development of early childhood education had 20 variables, c1-c20

Factor 4: The development of early childhood creative media and technologies level had 17 variables, d1-d17

Factor 5: The development of early childhood learning creative resources and atmospheres level had 14 variables, e1-e14

Factor 6: The development of early childhood creativity measurement and evaluation of education level had 15 variables, f1-f15.

2. The following steps were used to construct a model of Creative Academic Administration of Early Childhood level of schools under the Office of the Basic Education Commission in Thailand.

2.1 Researchers used Kaiser-Meyer-Olkin measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity to examine the factors. It was found that the KMO value was 0.860 and the Bartlett's Test of Approximate Chi-Square value was 3435.740. The results indicated that the techniques used to analyze the factors were well related with the collected data as shown in Table 1.

Table1. The results of examining factors using KMO and Bartlett's Test of Sphericity.

Factor	Bartlett's Test of Sphericity			Kaiser-Mayer-Olkin measure of Sampling Adequacy : (KMO)	
	Approx. Chi-Square	df.	Sig.	Criteria	Result
Creative Academic Administration of Early Childhood level of schools under the Office of the Basic Education Commission	50964.303	4753	.000	>.50	.860

2.2 Results of the Confirmatory Factor Analysis of a model of Creative Academic Administration of Early Childhood level of schools under the Office of the Basic

Education Commission in Thailand were shown in Table 2.

Table2. Results of the Confirmatory Factor

Analysis of a model of Creative Academic Administration of Early Childhood level of schools under the Office of the Basic Education Commission in Thailand.

Variable	\bar{X}	S.D.	CV	Factor Loading			
				ML	SE	t	R ²
The development of early childhood creative curricula level a	4.58	0.421	9.20	0.34	0.019	17.77	0.66
The development of early childhood creative learning processes level b	4.58	0.490	10.70	0.44	0.021	20.49	0.79
The creative research for the development of early childhood education c	4.52	0.538	11.91	0.47	0.024	20.09	0.78
The development of early childhood creative media and technologies level d	4.52	0.540	11.95	0.50	0.023	22.02	0.86
The development of early childhood learning creative resources and atmospheres level e	4.57	0.528	11.56	0.50	0.022	22.75	0.89
The development of early childhood creativity measurement and evaluation of education level f	4.53	0.566	12.50	0.55	0.023	23.72	0.94
Statistics values	$\chi^2 = 7.29$, $df = 5$, $P\text{-value} = 0.20028$, $RMSEA = 0.038$, $GFI = 0.99$, $AGFI = 0.97$, $RMR = 0.0014$, $CFI = 1.00$, $NFI = 1.00$ and $CN = 670.90$						

From table 2, the results from Confirmatory Factor

Analysis of a model of Creative Academic Administration of Early Childhood level of schools under the Office of the Basic Education Commission with 6 factors and 96 variables, each factor had standard factor loading ranged from 0.34 to 0.55. The reliability (R²) values were between 0.66 - 0.94. The main factor on the development of early childhood creativity measurement and evaluation of education level had the highest reliability.

Considering the congruence of the model with the empirical data, it indicated that the model was corresponded with the empirical data based on the empirical Chi-Square statistics, $\chi^2 = 7.29$, $df = 5$, $P\text{-value} = 0.20028$, $RMSEA = 0.038$, $GFI = 0.99$, $AGFI = 0.97$, $RMR = 0.0014$, $CFI = 1.00$, $NFI = 1.00$ and $CN = 670.90$ as shown in figure 1.

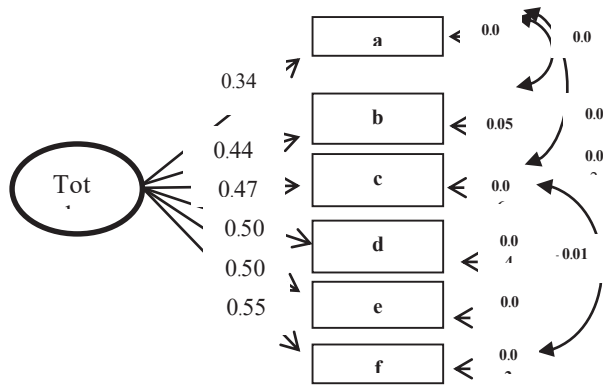


Figure 1. The confirmatory factor analysis of a model

From figure 1, the results from confirmatory factor analysis of a model of Creative Academic Administration of Early Childhood level of schools under the Office of the Basic Education Commission in Thailand revealed that the main factor on the development of early childhood creativity measurement and evaluation of education level had the highest factor loading. The development of early childhood creative media and technologies level and The development of early childhood learning creative resources and atmospheres level had the second highest factor loading values followed by the creative research for the development of early childhood education, the development of early childhood creative learning processes level, respectively. The development of early childhood creative curricula level had the lowest factor loading value. Therefore, the researchers had improved the model based on the factor loading values to propose this model to be used as a guild line for creative Academic Administration for Early Childhood level.

VII. CONCLUSIONS AND DISCUSSION

This research was to analyze confirmation factors of a model of the Creative Academic Administration for Early Childhood level of schools under the Office of the Basic Education Commission in Thailand.

The results obtained from confirmatory factor analysis indicated that there were 6 factors and they were well corresponded with the empirical data considering from index of congruence $\chi^2 = 7.29$, $df = 5$, $P\text{-value} = 0.20028$, $RMSEA = 0.038$, $GFI = 0.99$, $AGFI = 0.97$, $RMR = 0.0014$, $NFI = 1.00$, $CFI = 1.00$ and $CN = 670.90$. Each of the factors had factor loading values between 0.34 - 0.55 and had

reliability (R^2) values between 0.66-0.94. Considering factor loading values of the 6 main factors, they all had high t-value, all of the t-values were higher than 1.96. Construct Reliability (CR) was 2.67. Average Variance Extracted (AVE) was 0.91. The construct reliability (CR) was 2.67 and the Average Variance Extracted (AVE) was 0.91. The construct reliability (CR) of latent variables was higher than 0.60 and the average variance Extracted AVE was higher than 0.50 and these values passed the criteria as indicated [12]. Therefore, the results of this research had met the criteria. The results obtained from confirmatory factor analysis of a model of Creative Academic Administration for Early Childhood level of schools under the Office of the Basic Education Commission in Thailand revealed that the development of early childhood creativity measurement and evaluation of education level had the highest factor loading.

This indicated that the development of early childhood creativity measurement and evaluation of education level had to be conducted using various creative methods. Early childhood learners learn through experience and practice by themselves. Hence, measuring and evaluating development of learners should be related to activities in teaching and learning process based on the age of learners. Teachers monitor thinking process and promote student creative thinking continuously. Learners develop their knowledge and skills from various creative teaching and learning activities. Therefore, various tools should be used for measuring and monitoring education development of childhood level to obtain the best information.

The development of early childhood learning creative resources and atmospheres level had the second highest factor loading. Development of learning resources and learning atmosphere would lead to more opportunity for learners to learn from various sources from both inside and outside schools. Administrators should focus on the importance of development learning resources and learning atmospheres. They should manage to organize learning resource outside the schools as well. The creative children were the ones who eager to learn, search, survey, and dare to do things. They can develop their various skills from learning resources and learning atmosphere [13].

The development of early childhood creative media and technologies level, the same as the development of early childhood learning creative resources and atmospheres level, had the second highest factor loading. Media, innovation and education technology are the important tools for learning development. Learners are

activated by media. Based on vision of early childhood education curriculum 2017 [14], learners can develop knowledge, skills and life skills through media and innovation. Creative media, innovation and education technology development for early childhood level can promote learners to learn from experience and react with environment and enhance imagination, innovative thinking.

The development of early childhood creative curricula level had the lowest factor loading. This could be because the curriculum used in schools was launched in 2003, it is a flexible and international curriculum but it is also based on Thai way of life.

VIII. SUGGESTION

Suggestion for using research results

From the findings of this research, the development of early childhood creativity measurement and evaluation of education level had the highest factor loading. Administrators should encourage teachers to use creativity measurement and evaluation of education methods to evaluate development of learners in early childhood level in order to promote education quality of learners.

Suggestion for further research

Research on developing a model of Creative Academic Administration in Primary and Secondary education should be carried out.

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X. REFERENCES

- [1] Koster, B.J. (2001): Growing Artists: Teach art to young children. New York: Delmar
- [2] Ezzo, E. (2003): Introduction to early childhood education. Canada: Delmar Learning.
- [3] Phudphong, Suphachri. (2010): Enhance creativity through thinking skills. Educational Journal for Teachers and Parents 7 (2), 10-1.
- [4] Hoy, W.K. & Miskel, C.G. (2001): Educational administration: Theory, research and practice, 6th edition. Boston: McGraw-Hill.
- [5] Austin, Garham E, and John D. Reynolds. (1990): "Managing for Improved School Effectiveness: An International Survey." School Organization. 10(2/3). 101.
- [6] Kimbrough, R. B. and Nunnery, M. Y. Education Administration: An Introduction (3rd ed.). (1998): New York: Macmillan.
- [7] Torrance, E. P. (1972): Creative Learning and Teaching. New York: Book Mead Company.
- [8] Isaksen, S., G.; & Dorval, K. B.; & Treffinger, D.J. (2011): Creative Approaches to Problem Solving A Framework for Innovation and Change. New York: Sage.
- [9] Phanmanee Aree. (2014): Practice to think Think Creatively. Bangkok: Chulalongkorn University Press.
- [10] Suksoaraj Praphansiri. (2013): Thinking Development 5th, edition: Bangkok: Printing company limited partnership 9119 printing techniques.
- [11] Hair, J., Blak, W.C., Barbin, B.J., Anderson, R.E., & Tatham, R.L. (2010): Multivariate data analysis. New Jersey: Upper Saddle River, Prentice Hall, p. 94 - 118.
- [12] Suphasan, Angsuchot, Chotmat, Tawil, Vijitsiran, and Ratchanee, Kulpinyopananuvat. (2009): Analytical Statistics for Social Science and Behavioral Research Techniques Lisrel program. 2nd edition, Bangkok: Charoen Kong Printing.
- [13] Torrance, E. P. (1962): Guiding Creative talent. NJ: Prentice-Hall.
- [14] Ministry of Education. (2017): Early Childhood Education Curriculum BE 2560 Academic and Standards Office Education Office of the Basic Education Commission, Ministry of Education: Publishing House, Agricultural Co-operative Federation of Thailand, Bangkok.