The Linear Structural Relationship of Research - Supported Efficiency Factors in Secondary Educational Service Area 7

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Abstract

The purpose of this research is to study the Research-supported efficiency factors in Secondary Education Service Area 7. The population in this research is supervisors and teachers with research in Secondary Education Service Area 7. The fiscal year is 2015. The total number of people is 1171 guy. The sample used in this study is supervisors and teachers with research in Secondary Education Service Area 7. The fiscal year is 2015. The total number of sample is 313 guy. The independent variable in this study is agencies factor, personal factor, process management factor and Other factors. The dependent variable in this study is research efficiency. Tools used in research is multiple choice questionnaire (Rating Scale) data analysis using the average ($\bar{x}$), Standard deviation (S.D.) and Statistics and data analysis of respondents and test hypotheses in article 1. The analysis Confirmatory Factor Analysis (CFA) test hypotheses in article 2. Analysis using the Pearson correlation (Pearson's product moment correlation). Statistical analysis with LISREL.

The results of research:

1. The factors that support research and four factors of research at a high level.

2. The quality and benefits of research can affect the performance of research on a large scale.

3. The results of confirmatory factor analysis (CFA) of independent variable have 4 factors is 1) agencies factor 2) personal factor 3) process management factor 4) Other factors. And the results of confirmatory factor analysis (CFA) of dependent variable have 2 factors is 1) The benefits of research. 2) The quality of research.

4. The analysis of the linear structural relationship of research-supported efficiency factors in Secondary Education Service Area 7 is Every factor correlated structure.

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Background

Research is a process that strengthens knowledge in various field of study. It helps creating outstanding education and can be applied for other potential benefits in planning and setting of policies towards economical, social, political, and culture and tradition etc. These will lead to the sustainable development of community and nation at large. The research plays an important role that directly affects the development of the country. Once considering the impact of the research towards the country development thoroughly, it was found that the research is a major factor that support and create knowledge in many field such as the development of the economy. The research provides support in the innovation of products and services that change and generate benefits in the business and industrial sectors. Economic system requires the research finding for effective and efficient development. Besides, the finding of the research also helps in decision making process, for example, market demands, value of the investment, market potential and so forth. Therefore, a good quality of research done in the right time and helps making the right decision.

The research has come into Thailand for 55 years. It came during the time that Thailand decided to have National Economic and Social Development Plan. The starting point came from the institutions that provide education program such as Faculty of Education (Chulalongkorn University), Faculty of Educational Research (Srinakharinwirot University) and International Institute for Child Study. This creates common understanding that the research is faculty member's duty to do along with the teaching and educational services provide to the society. However, it was found that only less amount of faculty members are conducting research. For example, in teacher's college, the research has been specified to be one of their duties according to Teacher and Educational Personnel Act in 1975. In the early stage, there was only a little faculty member who conducted research. Nevertheless, these days, their opinion and believe have been changed in such a way that they are more understand on the necessity and significance of the research that need to be done in all educational level. This is because the research is a good way to improve the effectiveness of the education. The educational research is conducted to explore and identify truth and reality underlying the education, especially for the benefit in improving educational work. Chatsumon Phrŭtthiphinyō defined the research as the process of identifying knowledge and truth by trustable plan in order to form rules, regulations, and theory that explain phenomenon and allow for better control and future prediction.

The development of education in Thailand is under the framework of "The second educational reform" by having the National Education Act of B.E.2542 and Srinoi Povatong (2003) as blue prints. It consists of laws,

rules and regulations that are correspondingly with the National Education Act of B.E.2542 and the National Education Act (No.2) B.E.2545 (2002). The research is clearly indicated as a main responsibility and duty of teacher and educational personnel. The important detail is in section 30.

Section 30: Educational institutions shall develop effective learning processes. In so doing, they shall also encourage instructors to carry out research for developing suitable learning for learners at different level of education.

Statement of problems

Currently, the research system in Thailand is not very effective; therefore, the research has not fully developed as much as it was expected to be. There are various problems and barriers in many aspect of the country such as research and development resources. It was found that the budget for the research implementation in Thailand was limited. Research personnel and country development personnel include researcher, research assistant, and research supporter. However, even though the number of the research personnel tends to increase over the year, there is still the lack in term of quantity and quality, especially for the researcher. There are too many small research institutions that work independently and did not work in collaborate with each other whether in between government authorities, universities and private sectors. For the management and administrative of the research implementation,

there are lack of integration in term of policies, research strategies, and the allocation of research budget. For the research finding, it was found that intellectual property generated by the research done between institution who gives and takes the research budget were not sufficient to motivate people to do the research. Published research paper is an important assessment revealing the achievement of research and development activities. The Thailand Development Research Institute (2010) revealed that Thailand has not so many published research papers comparing to other countries such as Japan, China, Korea, and Taiwan. The dissemination and implication of the research finding are still limited and there is a lack of mechanical that link between institution that did the research and institution that will make use of the research finding. Therefore, the research benefits are still uncompleted as it cannot provide real solution to the problems. In addition, the level of competition of the country is critical information for the planning of country development plan. It is a tool that helps reflecting status and capability of the country comparing to other countries. It was found that the level of competitive capability of Thailand has decreased. In term of infrastructure, Thailand is weakest country. For the Balance of Payments on technology, income of Thailand in B.E. 2542-2546 has found to be even more deficit every year. This indicates that Thailand still has to rely on buying technology from other countries Bureau of the Budget (2003).

Research objectives

      1. To explore factors that support the effectiveness of research in 4 aspects, including organizational, personnel, managing process and other aspects such as social, culture, and tradition.

      2. To explore the level of effectiveness in term of the quality and research benefits.

      3. To analyze components of the factors that supports the effectiveness of research done in Secondary Educational Service Area 7.

      4. To analyze the Structural Relationship of Research - Supported Efficiency Factors in Secondary Educational Service Area 7

Hypothesis

      1. Factors that support the effectiveness of research consists of 4 factors, including organizational, personnel, process and other factors and the effective research consists of the quality and research benefits.

      2. Factors on organizational, personnel, managing process and other are having Structural Relationship of Research - Supported Efficiency Factors in Secondary Educational Service Area 7.

Research framework

Independent variable　　　　　　　　　　　　**Dependent variable**
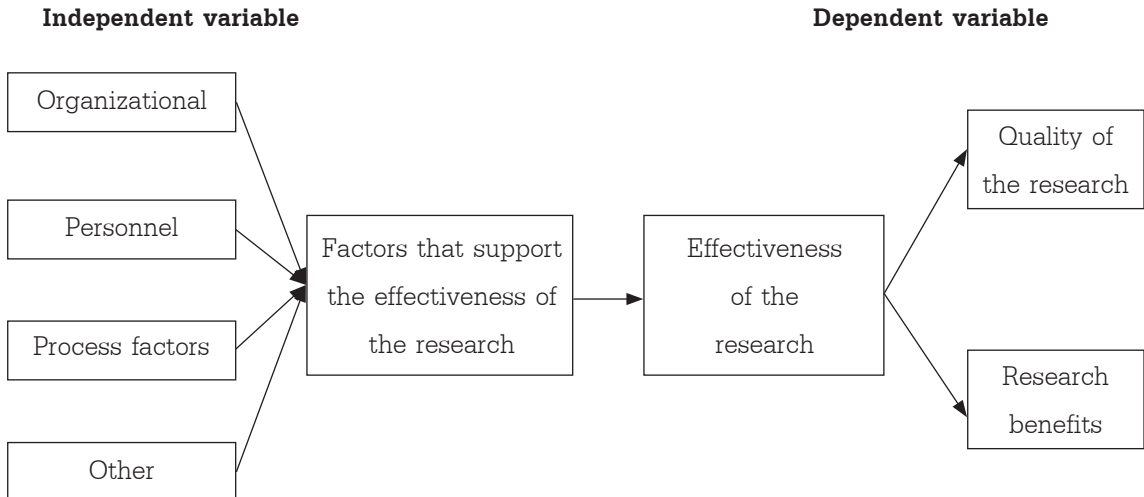
Figure 1 Research framework

Research methodology

In this research, Descriptive research methodology was implemented. The sample were research personnel who in charge of Secondary Educational Service in Area 7. The research instrument that was used was questionnaire survey related to the factors that support the effectiveness of the research done in the Secondary Educational Service in Area 7.

Population and sample

Research population was 1,711 people, including educational personnel and teacher who has done research in the Secondary Educational Service in Area 7 in 2015.

The sample was educational personnel who were responsible in research implementation and teachers who have done research in Secondary Educational Service in Area 7 in 2015. By applying Krejcie & Morgan's sample selection theory (Krejcie & Morgan, 1970: 607-610), there were 313 participants selecting by using stratified random sampling.

Research instrument

The research instruments used in this research was questionnaire that was divided into 3 main parts.

Part 1 consists of questions on demographic characteristic of the participants. The questionnaire was developed in form of check list on gender, education, position, research experiences, and general information on previous research that have done.

Part 2 consists of questions on factors that support the effectiveness of research which consists of 4 factors, including organizational,

personnel, process and other factors.

In part 2, there are 5 rating scale to select according to Likirt's Rating Scale.

Part 3, the questionnaire is about the effectiveness of research done in the Secondary Educational Service in Area 7 on quality and research benefits aspect.

Research instrument development

The researcher has developed research instrument that consists of 3 main parts in order to collect the data. Part 1 consists of questions on demographic characteristic of the participants. Part 2 consists of questions on factors that support the effectiveness of research and part 3 about the effectiveness of research done in the Secondary Educational Service in Area 7. In part 2 and part 3, 5 rating scale are provided based on Likirt's Rating Scale. The process of the research instrument development includes

1. Study on related-document, theory, and other research study about factors that support the effectiveness of the research.

2. Developing questionnaire survey form from those factors that support the effectiveness of the research in the Secondary Educational Service Area 7

3. Presenting that questionnaire survey form to the advisor to check the correctness, appropriateness, language usage, and conformity with variable and improve it according to advisor's advice.

4. Checking content validity using IOC (Index of Item Objective Congruence) by presenting to 3 experts to ensure that the IOC

is greater than 0.50.

5. Checking for reliability by trying out with 30 people who are not the participant of the research. Then, using those finding to analysis reliability by using aDistributing the questionnaire survey to the sample of the research to collect the data

Data analysis

1. Analyzing demographic characteristic of participant by using frequency and percentage.

2. Analyzing participants' answer by using $\bar{x}$ and standard deviation (S.D.) and comparing $\bar{x}$ with standard invented by Best.

3. Assessing the Structural Relationship of Research - Supported Efficiency Factors that affect the effectiveness of the research by using Confirmatory Factor Analysis (CFA) and assess the hypothesis with opinion of research participants through Structural Equation Model Analysis. It is the analysis that analyzes relationship between variables through the use of statistic program to assess whether the finding goes along with the theory. Linear Structure Relationship model (LISREL) was conducted to assess hypothesis model that the researcher had created. The assessment was done in 2 ways include 1) Overall Model Fit Measure   2) Component Fit Measure

Result

The result of the research can be concluded as follow:

Part 1: The result from the analysis confirmed the variable theory that has been used in this research.

The researcher has distributed the questionnaire survey to 313 participants. All 313 sets (100% of survey distributed) were returned. The concept suggested by Bob Waworuntu was applied in this research. He suggested that factors that support effective research consists of 4 factors include organizational, personnel, process and other factors (Bob Waworuntu, 1986). There were 2 dependent variables which were quality variable and research benefits variable. The researcher collected all data from questionnaire surveys and analyzed by using $\bar{x}$ and S.D.

Part 2: The analysis of the Structural Relationship of Research

Supported Efficiency Factors in Secondary Educational Service Area 7 was done by looking at Pearson's Product Moment Correlation and LISREL result.

Conclusion

From the research finding, the researcher has provided conclusion according to each research objectives as follow:

1. Research analysis of Supported Efficiency Factors in Secondary Educational Service Area 7 by using Confirmatory Factor Analysis (CFA) revealed that:

1.1 Factors that support effective research in Secondary Educational Service Area 7 consists of 4 factors include (1) organizational factors (2) personnel factors (3) managing process factors and (4) other factors. Every factor has an impact on the research effectiveness ranging from 0.31-0.67. The factor

that has the highest weight was other factors of 0.67 whereby the variation with factors that support the research contributed to about 64%. Following by managing process factors that have the weight of 0.54 and the variation with factors that support the research contributed to about 52%. Organizational factors contributed to about 0.42 with the variation with factors that support the research of 41%. Last but not least, personnel factors have the weight of 0.31 and the variation with factors that support the research contributed to about 30% respectively. The detail of each factors are as follow:

1.1.1 Overall, all 30 organizational factors were in the high level once considering factor by factor. The important factor that had the highest $\bar{x}$ value was the communication of research information through online database. Whereas, the factor that had the lowest $\bar{x}$ value was the setting of plan and project in supporting research implementation in the Secondary Educational Service Area 7.

1.1.2 Overall, all 20 personnel factors were in the high level once considering factor by factor. The important factor that had the highest $\bar{x}$ value was the researcher's experience that affects the effectiveness of the research. Whereas, the factor that had the lowest $\bar{x}$ value was the positive attitudes of the researcher towards the effectiveness of the research.

1.1.3 Overall, all 30 managing process factors were in the high level once considering factor by factor. The important factor that had the highest $\bar{x}$ value was the appropriate setting of achievement criteria. Whereas, the factor

that had the lowest $\bar{x}$ value was the giving of power to the researcher.

1.1.4 Overall, all 20 other factors were in the high level once considering factor by factor. The important factor that had the highest $\bar{x}$ value was the language used in the communication process such as local language and non-verbal language. Whereas, the factor that had the lowest $\bar{x}$ value was the student and community members' way of living.

1.2 Research analysis of the components of Efficiency Factors in Secondary Educational Service Area 7 by using Confirmatory Factor Analysis (CFA) revealed that:Both dependent variable weights of Efficiency Factors from were found to be positive ranging from 0.43 to 0.51. All variables were of significant. The variable that had the highest weight was research benefits variable which contributed to 0.51 and the variation with factors that support the efficiency research was 50%. Following by research quality that has the variable weight of 0.43 and the variation with factors that support the efficiency research was 44% respectively. The detail of each factors are as follow:

1.2.1 Overall, all 18 research quality factors were in the high level once considering factor by factor. The important factor that had the highest $\bar{x}$ value was having the dissemination of the research findings to other organizations/ institutions. Whereas, the factor that had the lowest $\bar{x}$ value was providing research support and exchange research knowledge with others.

1.2.2 Overall, all 22 research benefits factors were in the high level once

considering factor by factor. The important factor that had the highest $\bar{x}$ value was Teacher's research supports the usage the research finding in their careers. Whereas, the factor that had the lowest $\bar{x}$ value was Teacher's research promotes the improvement of teaching method.

2. From the analysis of the Linear Structural Relationship of Research - Supported Efficiency Factors in Secondary Educational Service Area 7, it was found that Chi-Square : x^2 was equal to 0.00 (P = 1.00). This revealed that there was no statistical significance. The Structural Relationship of Research - Supported Efficiency Factors that affect the effectiveness of the research in the Secondary Educational Service Area 7 was in accordance with empirical data and other index such as Goodness-of fit Index (GFI) and Adjusted Goodness-of-fit Index (AGFI) that the value were close to 1. Again, as GFI=0.97 and AGFI=0.95 were greater than 0.90, it shown that the Structural Relationship of Research - Supported Efficiency Factors that affect the effectiveness of the research in the Secondary Educational Service Area 7 was in accordance with empirical data. Moreover, as Root Mean Squared Residual (RMR) was equal to 0.035 and Root Mean Squared Error of Approximation (RMSEA) was found to be 0.00, it revealed that the model was in accordance with the empirical data. The assessment on the Goodness of Fit Index (GFI) revealed that the Product Moment Correlation of factors was ranging from 0.169 to 0.561 whereby it was all positive. Personnel factors and other factors had

the highest level of correlation (r = .561). Every variable factor had a Structural Relationship of Research - Supported Efficiency Factors that affect the effectiveness of the research with R^2 of 0.284. The independent variables for the prediction of effectiveness of the research was found to have significance of 0.05 that consist of managing process factors, organizational factors, research quality factors and research benefits factors.

Discussion

The discussions on research finding are as follow:

1. Research analysis of Supported Efficiency Factors in Secondary Educational Service Area 7 by using Confirmatory Factor Analysis (CFA) revealed as follows:

The factors that support effective research in Secondary Educational Service Area 7 consists of 4 factors include (1) organizational factors (2) personnel factors (3) managing process factors and (4) other factors. These were supported by the research done by Kanyarat Aeumumporn (2005: Abstract) that focused on the factors affecting research conducting by research personnel. The research participants were Payap University's Staff in 2008. The research finding indicated that factors affecting the conducting of the research include researcher-related factor, basic factors in conducting research, and research support from other organizations/institutions. Also, it was in accordance with the research done by Jiraporn Aemium that studied on factors

affecting the conducting of research of teachers in Phitsanulok Primary Educational Service Area Office 3, Office of the Basic Education Commission. She suggested that factors affecting the conducting of research can be categorized into 2 factors, including personal factors and managing process factors.

2. From the analysis of the Linear Structural Relationship of Research - Supported Efficiency Factors in Secondary Educational Service Area 7, it was found that Chi-Square : x^2 was equal to 0.00 (P=1.00). This revealed that there was no statistical significance. The Structural Relationship of Research - Supported Efficiency Factors that affect the effectiveness of the research in the Secondary Educational Service Area 7 was in accordance with empirical data and other index such as Goodness-of fit Index (GFI) and Adjusted Goodness-of-fit Index (AGFI) that the value were close to 1. Again, as GFI=0.97 and AGFI=0.95 were greater than 0.90, it shown that the Structural Relationship of Research - Supported Efficiency Factors that affect the effectiveness of the research in the Secondary Educational Service Area 7 was in accordance with empirical data. Moreover, as Root Mean Squared Residual (RMR) was equal to 0.035 and Root Mean Squared Error of Approximation (RMSEA) was found to be 0.00, it revealed that the model was in accordance with the empirical data. The assessment on the Goodness of Fit Index (GFI) revealed that the Product Moment Correlation of factors was ranging from 0.169 to 0.561 whereby it was all positive. Personnel factors and other factors had

the highest level of correlation (r=.561). Every variable factor had a Structural Relationship of Research - Supported Efficiency Factors that affect the effectiveness of the research with R^2 of 0.284. The independent variables for the prediction of effectiveness of the research was found to have significance of 0.05 that consist of managing process factors, organizational factors, research quality factors and research benefits factors. The discussions were:

2.1 Other factors are variables that highly influence the effectiveness of the research. The reasons might be because the society and the development of the educational service have been changed in such a way that the researches are having more important roles in the process. This makes teachers and other educational institution aware of the important of the research. The National Education Act of B.E.2542 and the National Education Act (No.2) B.E.2545 (2002) are clearly indicated the importance of the conducting of the research as a main responsibility and duty of teacher and educational personnel. The emphasis has been given to ensure researches are part of the learning process. Currently, the government tried to embed the research as a method for teachers and other educational personnel to make educational achievement. People who achieve academic standing will be accepted in the teacher society and earn more income and compensation. This might be the underlying reasons that explain why more teacher and educational personnel are putting more attention in doing research during the past

2-3 years. This was supported by the research done by Kanyarat Aueumporn who suggested that compensation or other benefits have direct affect on the conduction of research. In addition, Kasorn Kunamai had studied on the factors that help achieving academic standing and career growth in Payao Primary Educational Service Area Office 1.

2.2 Managing process factors are variables that highly influence the effectiveness of the research follow the other factors. Management team is of important as they are the one who judge the direction of the organization. If the management team understands the significant of the research and research procedure, teachers tend to be more aware of the importance of the research and might apply them to create learning activities for their students. Anderson (2000) who studied on educational-related leadership behavior also suggested that management team should have responsibility to set mission of the school, set up program, control teaching process, assess student progress, and create learning environment so that the teaching process will be conducted effectively.

2.3 Organizational factors are variables that can influence the effectiveness of the research. The reasons might be because organization is of important in policy setting and providing direction in the development of the organization, especially the educational service in the area that works closely with the teachers. Therefore, if the management team in the organization understands the significant of the

research, the teachers under their control tend to also understand the research significance.

2.4 Personnel factors are also variables that can influence the effectiveness of the research. The reasons might be because the participants of this research were educated people and have knowledge and have positive towards the research. Therefore, all variables on age, education, research experience tend to affect research effectiveness. This is in accordance with the study done by Surasak Karun whose research was focused on factors affecting research conducting of teachers in Nakhon Panom Educational Service Area 2. He found out that those factors consists of researcher and other related personnel's characteristic with the statistical significance of 0.05

Recommendation

From the analysis of the Linear Structural Relationship of Research - Supported Efficiency Factors in Secondary Educational Service Area 7, the important factors on teacher's research development were found. As a result, in order for the teacher to apply this knowledge effectively, the recommendations are provided as follow:

General recommendations

1. Recommendation on policy

Every Educational Service Area should set up the policies in such a way that make the research as part of the classroom activities. There should be the assignment of some people to work on research in every

Educational Service Area. Moreover, the research network should be established in order to support research instrument and tools for conducting the research.

2. Recommendation for action

Even though majority of teacher are aware of the important of the research, there are still lack of support from related organizations/ institutions in the higher level. Therefore, there should be the helps from experts and the establishment of information center that provide the collection of research paper in every Educational Service Area. This is to make better understanding towards the research among teachers. In addition, the learning forum can be conducted in order to create a place for the exchange of knowledge in similarly to the conduction of the student's Student craft fair.

Recommendations for future research

Recommendations for future research are as follows:

1. There should be teacher and educational personnel development program that support effective research and allow them to apply the research finding to the teaching process.

2. There should be a qualitative study on the working process on the use of research finding of educational personnel, starting from developing, using, and disseminate finding.

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