

Effects of Reflection Process on Classroom Action Research Effectiveness: Mixed Methods Research

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The purposes of this research were 1) to study reflection process on classroom action research, 2) to study the effects of the reflection process on classroom action research effectiveness from the selected good cases, 3) to develop the causal model of effects of reflection process on classroom action research effectiveness with mediator, and 4) to examine the goodness of fit of the model with empirical data. Mixed methods research was used by conducting quantitative method to extend qualitative results. Schools and teacher researchers were selected from Secondary Educational Service Area Office 1 as the research sampling. Interview forms and questionnaires were used for data collection. Data were analyzed by using analytic of induction and structural equation model analysis using LISREL 8.72. Research results showed that reflection process on classroom action research was divided into six steps which consisted of knowing what to do, correcting and changing, learning from doing, leading to new understanding, thinking of innovating, and acting from reflection. Result of reflection process was found as a mediator from case study method and was mediated between reflection process and classroom action research effectiveness. Developing causal model was consisted of four exogenous latent variables and three endogenous latent variables. The developed causal model of classroom action research effectiveness that cause of reflection process with mediator was fit to the empirical data ($\chi^2 = 133.59$, $df = 150$, $p = .828$, $GFI = .987$, $AGFI = 0.963$). This model could explain the variance in reflection process, result of reflection process, and classroom action research effectiveness about 86.7, 91.7 and 97.7 percent respectively.

Keywords: classroom action research effectiveness, mixed methods research, reflection process

Reflection was used as a key measurement in order to develop in various professions. Reflection was a strategy to develop people or staff for learning new methods from their jobs. Moreover, reflection was the process to develop both personal and organizational level. Leaders could modify workplace to be a community of reflection which initiated new technique of work. In recent year, reflection has become an important mechanism to push forward of self-development to gain high potential in the profession, and supported to be a collaborative learning community. (Gustafson & Bennett, 1999; Randle & Tilander, 2007; Epp, 2008; Fade, 2009)

Reflection was also used in educational context. Teacher used reflection as a process of professional development. Both self – reflection and peer – reflection were used within teacher’s community. This method has grown to be a reflective community. Teacher used reflection process to share idea and practice with another teacher and school head master. If every single step of work has been sharing with others, it will support teaching job effectively. Reflection has been divided into two aspects from literature review. First aspect supported that reflection process was the developing strategy that emerged effective practice. (Freese, 1999; Kreber, 2005; Hoban & Hastings, 2006; Randle & Tilander, 2007; Watts & Lawson; 2009) Second aspect was about studying in reflection and level of reflection within person. (Malkani & Allen, 2005; El-Dib, 2007; Gilstrap & Dupree, 2008; Chamoso & Caceres, 2009; Seng, 2008; Sambrook & Stewart, 2008; Yang, 2009)

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Classroom action research has become one part of the teaching job that teacher needed to conduct during teaching. Classroom action research was a systematic method to support teacher in order to develop teaching and learning activities. However, the process of classroom action research was quite hard and complicate for the beginners. As the result, effective strategies were still needed for supporting teachers while they were conducting classroom action research. Reflection process should be an effective strategy which effected to teacher's development of classroom action research. (Hoban & Hastings, 2006; Moran, 2007) After using reflection process on conducting classroom action research, teachers were able to receive new knowledge and teaching strategies which transformed from normal teaching to be an effective teaching. This process was related to theory of practice of Argyris and Schon (1974 cited in Redmond, 2004) that started from knowing – in – action of normal action until reached reflective practice in order to try innovative methods.

The study from related research found that there was not any effective model which caused from reflection. Pattern of reflection process for classroom action research was not clearly found. Reflection process has been normally used for general teaching and learning activity. Reflection process was known slightly in Thai context both in teaching and conducting research. Therefore, development of a causal model with reflection process was interested in this research for studying the effect of reflection process on classroom action research effectiveness. According to previous research, a casual model of classroom action research effectiveness was not clearly found. Mixed methods research might be very useful research method in order to answer the research questions. Mixed methods research was also very famous in recent year and it was an appropriate method to develop the conceptual framework. Moreover, this research was designed into two phases which needed to find out grounded theory by using qualitative method for developing a causal model. Then, quantitative method was used to confirm the causal model with the empirical data. As the result, mixed methods research would be the best method for this research design in order to propose the causal model for supporting teacher to conduct classroom action research through reflection process.

The following research questions guided this study:

1. How many steps of reflection process that support classroom action research?
2. How does reflection process effect to classroom action research effectiveness?
3. What is the best composition of latent variables to develop the causal model of effects of reflection process on classroom action research effectiveness with mediator?
4. Is the developed causal model fit with empirical data?

Research Objectives

1. To study reflection process on classroom action research
2. To study the effects of the reflection process on classroom action research effectiveness from the selected good cases
3. To develop the causal model of effects of reflection process on classroom action research effectiveness with mediator
4. To examine the goodness of fit of the model with empirical data.

Literature Review

The process of reflection was an integral part of teaching practice. Reflection underpinned all your learning and it was a vital part of your later professional practice.

Reflection was a 'looking back' on experiences in a professional context. It was a looking back on experiences so as to learn from them. Therefore reflection was a means of constructing knowledge about one's self and about the world.

Gustafson & Bennett (1999) identified eleven variables that affected the reflective behavior. These eleven variables are grouped into three main characteristics. First group was learner characteristics which consisted of 1) learner's skill and experience in reflective thinking, 2) breadth of learner's knowledge of the content area, 3) learner's motivation to complete the reflection task, 4) mental preparation (mental set) for reflecting, and 5) degree of security felt in reporting actual reflections versus perceived desired responses. Second group was environmental characteristics which consisted of physical environment in which reflection occurs and Interpersonal environment in which reflection occurs. Third group was reflection task characteristics which consisted of 1) nature of the stimulus questions, directions, or probes, 2) format required for reporting reflections, 3) quality of the feedback provided following reflection, and 4) consequences of reflecting.

Redmond (2004) has presented Schon's process of reflective practice which related to reflection process. There were six steps of practice which consisted of knowing in action, surprise result, knowledge in action, reflection on action, reflection in action, and reflective practice.

Classroom action research was the research that conducted by teachers. The research problem was found from the situation in classroom. Teacher used process of classroom action research to find new method for helping student's learning. It was an urgent research that needed to conduct quickly and used to solve student's learning problem immediately. (Mattetal, 2001 cited in Wongwanich, S., 2005)

Many researchers have been used mixed methods research as the research design in recent year (Creswell, 2009; Tashakkori and Teddlie, 1998 cited in Wiratchai, N., 2009). There were four different designs of mixed methods research which have been used in many field of research project, which consisted of 1) qualitative measures to develop quantitative instrument, 2) equal and parallel qualitative and quantitative method, 3) qualitative method to explain quantitative results, and 4) quantitative method to extend qualitative results which has used for this research design.

The literature review showed that reflection process was important process for practice in order to gain professional development especially in teaching profession. Classroom action research was a helpful research that teacher researchers conducted for supporting students' learning. The best causal model could help to guide the process of practice. Therefore, the effective research design should be a mixed methods research that would help to design both qualitative and quantitative research which related to research questions.

Conceptual Framework

As this research was designed by using mixed method, so the conceptual framework was set as a temporary framework for guide between doing research process. There were four exogenous latent variables, two endogenous latent variables and one unknown endogenous latent variable. The relationship between latent variables as showed in figure 1.

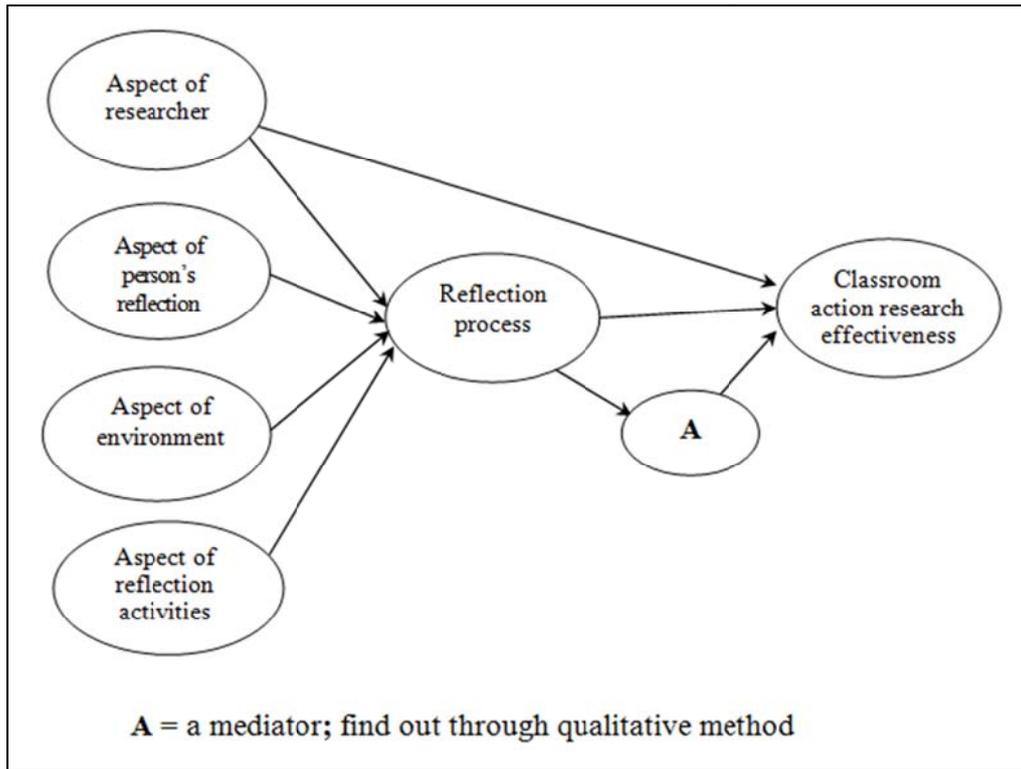


Figure 1. Conceptual Framework of a Causal Model of Effects of Reflection Process on Classroom Action Research Effectiveness with Mediator

Research Hypothesis

This research has been developed the causal model of effects of reflection process on classroom action research effectiveness with mediator. Mixed methods research was used to develop the theory of conceptual framework from literature review, related research, and field studies. After the analysis of qualitative data, research hypothesis then set for quantitative research. Therefore, the research hypothesis was “the causal model of effects of reflection process on classroom action research effectiveness with mediator was fit to the empirical data”.

Methodology

Mixed methods research was used as this research design by conducting quantitative method to extend qualitative results and was showed in figure 2.

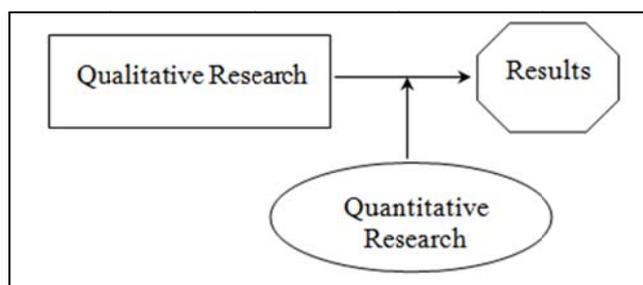


Figure 2. Mixed Method Research of Quantitative Method to Extend Qualitative Results
Source : Tashakkori and Teddlie (1998, cited in Wiratchai, N., 2009: p.57)

From literature review found that most of reflection process was studied by using qualitative research. The results were analyzed by using qualitative method. However, mixed methods research has been used for this research. The research design was divided into two phases in sampling design, measurement design, and analysis design as below.

Sampling Design

Participants in field study in qualitative phase were eight best practices of teacher researchers from Secondary Educational Service Area Office 1. Purposive sampling was used for the selection. In second phase of this research was quantitative research. The sampling was also selected from the same educational service area, and a 720 teacher researchers were selected as the research sampling by using stratified random sampling.

Measurement Design

Two interview forms were used for data collection in field studies. Questions were related to four exogenous latent variables and three endogenous latent variables. Questionnaire was designed after finished qualitative results. Questionnaire was divided into eight parts which consisted of general information of samples, aspect of researcher, aspect of person's reflection, aspect of environment, aspect of reflection activities, reflection process, result of reflection process, and classroom action research effectiveness.

Analysis Design

Qualitative data was analyzed by using analytic of induction. For quantitative data, confirmatory factor analysis was conducted to initially evaluate the validity of the measurement model. Structural equation modeling (SEM) was conducted to test the research hypothesis.

Results

1) Reflection process on classroom action research was divided into six steps which consisted of knowing what to do, correcting and changing, learning from doing, leading to new understanding, thinking of innovating, and acting from reflection. These six steps were showed in figure 3.

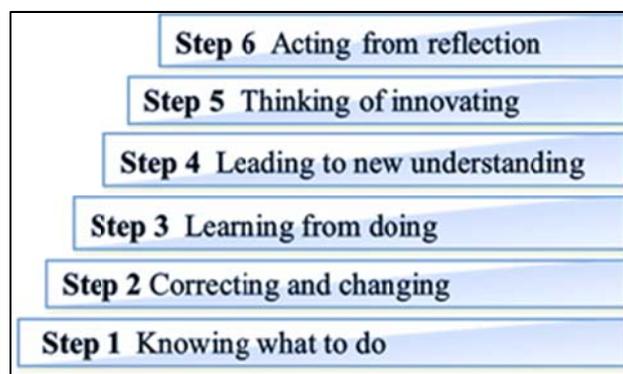


Figure 3. Reflection Process on Classroom Action Research

2) The factors affecting reflection were aspect of researcher, aspect of person's reflection, aspect of environment, and aspect of reflection activities. The good practice of classroom

action research consisted of a) clearly planning b) confidently doing research c) reflecting the research results with others d) supporting habits towards research and e) having good knowledge of research. In addition, the study of selected good cases indicated that the effects of the reflection process on classroom action research effectiveness were direct and indirect effects mediated through result of reflection process, measuring from knowledge on research process, acceptance of reflection process, and attitude towards learning from reflections.

3) The developed model consisted of four exogenous latent variables and three endogenous latent variables with result of reflection process as a mediator, mediating the effects of the reflection process on classroom action research effectiveness.

4) The developed causal model of classroom action research effectiveness that cause of reflection process with mediator was fit to the empirical data ($\chi^2 = 133.59$, $df = 150$, $p = .828$, $GIF = .987$, $AGFI = 0.963$). This model could explain the variance in reflection process, result of reflection process, and classroom action research effectiveness about 86.7, 91.7 and 97.7 percent respectively. Correlation matrices between latent variables found that each pair of variables had positive correlation. The correlation matrices showed between .661 to .980, and the highest correlation matrix was the correlation between reflection process and classroom action research effectiveness. Considering direct and indirect effects on classroom action research effectiveness found that aspect of researcher and reflection process had a significant direct effect toward classroom action research effectiveness ($p < .01$). Reflection process had an indirect effect toward classroom action research effectiveness with result of reflection process as a mediator, but it was not at significant level.

From this result showed that teacher could conduct classroom action research effectively if they used six steps of reflection process. Result of reflection process also supported classroom action research effectiveness of teacher researcher. The analysis results of this research were showed in table 1 and figure 4.

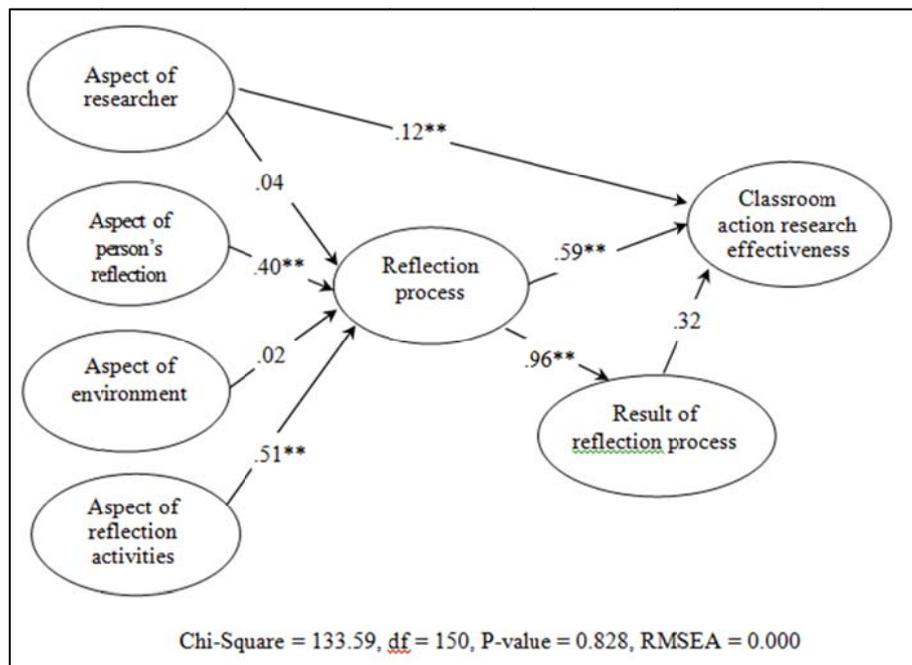


Figure 4. A Causal Model of Classroom Action Research Effectiveness That Cause of Reflection Process with Mediator

Table 1

Statistical Analysis of Correlation between Latent Variables and Effect of Causal Model of Classroom Action Research Effectiveness that Cause of Reflection Process with Mediator

Effect variables Causal variables	REFLPRO			REFLRES			CAREFF		
	TE	IE	DE	TE	IE	DE	TE	IE	DE
CHARACT	.038** (.040)	-	.038** (.040)	-	-	-	.151** (.035)	.034 (.036)	.117** (.027)
REFLECT	.401** (.095)	-	.401** (.095)	-	-	-	-	-	-
ENVIR	.017 (.049)	-	.017 (.049)	-	-	-	-	-	-
ACTIVITY	.507** (.092)	-	.507** (.092)	-	-	-	-	-	-
REFLPRO	-	-	-	.972** (.071)	-	.972** (.071)	.900** (.072)	.306 (.204)	.595** (.223)
Statistics	$\chi^2 = 133.59$ df = 150 p = .828 GFI = .987 AGFI = .963 RMR = .009								
Variable	REFLPRO1	REFLPRO2	REFLPRO3	REFLPRO4	REFLPRO5	REFLPRO6			
Reliability	.223	.331	.303	.300	.324	.341			
Variable	REFLRES1	REFLRES2	REFLRES3	CAREFF1	CAREFF2	CAREFF3			
Reliability	.806	.888	.756	.829	.848	.807			
Variable	CHARACT1	CHARACT2	CHARACT3	CHARACT4	CHARACT5	CHARACT6			
Reliability	.470	.588	.572	.493	.671	.516			
Variable	REFLECT1	REFLECT2	REFLECT3	REFLECT4	REFLECT5	ENVIR1			
Reliability	.684	.732	.610	.624	.696	.671			
Variable	ENVIR2	ACTIVI1	ACTIVI2	ACTIVI3	ACTIVI4				
Reliability	.858	.738	.807	.787	.872				
Structural Equation of Variables	REFLPRO		REFLRES		CAREFF				
R SQUARE	.867		.917		.977				
Correlation Matrix between latent variables									
Latent Variables	REFLPRO	CAREFF	REFLRES	CHARACT	REFLECT	ENVIR	ACTIVITY		
REFLPRO	1.000								
CAREFF	.980	1.000							
REFLRES	.957	.965	1.000						
CHARACT	.683	.732	.654	1.000					
REFLECT	.907	.903	.869	.736	1.000				
ENVIR	.807	.803	.772	.661	.816	1.000			
ACTIVITY	.914	.901	.876	.668	.916	.862	1.000		

Note : Numbers in parentheses is standard error value , **p < .01

TE = Total effects, IE = Indirect effects, DE = Direct effects

Discussions

The research finding showed that reflection process on classroom action research was divided into six steps which consisted of knowing what to do, correcting and changing, learning from doing, leading to new understanding, thinking of innovating, and acting from reflection. This finding was related to the process of practice that was presented by Schon (Redmond, 2004). This reflection process also related to theory of practice that Argyris and

Schon had been presented since 1974. This reflection process was considered to use for self-development and organization to shift from normal working habit into an effective working habit in order to gain their professional development. It was the process of learning that correlate with transformative learning theory (Mezirow, 1996 cited in Taylor, 2010).

The causal model of classroom action research effectiveness that cause of reflection process with mediator was fit to the empirical data. This result was related to research hypothesis. Reflection process also had a significant direct effect toward classroom action research effectiveness. Moreover, the highest correlation matrix was the correlation between reflection process and classroom action research effectiveness. These results showed that teacher researchers who used reflection process as the process to conduct classroom action research would show their effectiveness in classroom action research. Therefore, the result from qualitative data also supported that teacher researchers used reflection process continually during they were conducting research which related to the study of Chamoso and Caceres (2009) about the role of reflection process to motivate the highest potential of learning to practice.

Recommendations

The recommendations for practice were as follows:

1. The result of this research will guide the school administrator to encourage teacher researchers on conducting classroom action research by using reflection process as a part of their professional development.
2. In order to achieve a real success for teacher development of classroom action research, school should focus on teacher training which related to reflection process that have aspect of person's reflection and aspect of reflection activities as the main factors of developed plan.
3. The stimulus questions, quality of the feedback provided following reflection, and consequences of reflecting are needed to develop reflection process during conducting classroom action research.

The recommendations for further research were as follows:

1. This research finding showed that result of reflection process was not the best mediator. In order to do future research, researcher needs to check the measurement variables and try to adjust the model again.
2. Aspect of environment was not showed any effect to reflection process at significant level, so researcher needs to consider with the literature review to find out more information. Moreover, researcher should try to collect new data and analyzes the model again for study how fit of the model with the empirical data.

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