

Executive Summary

The research synthesis project is conducted to synthesize on methods, techniques, strategies, processes and innovations used in teaching and learning in basic education level in order to promote student's thinking abilities collected from Thailand and international research studies. The objectives of this study are: to analyze research characteristics, research quantity, research quality and effect size of innovations used in developing students' thinking in basic education level from research studies in Thailand and international; and to synthesize knowledge and approaches for supporting and developing innovations to promote students' thinking abilities. The research procedures consist of (1) searching and selecting research studies from domestic and international, then coding them into research database; (2) synthesizing research studies; and (3) studying trends and applications promoting thinking skills in 47 National profession teachers and award teachers. There are six sets of research instrument used in this study: four sets of data coding, a form of research quality evaluation, and a questionnaire. The data is analyzed in descriptive statistic and content analysis.

The summary of research results are as follow:

1) There are 276 research studies about innovations used in developing Thinking skills of students and teachers from domestic and international countries which are recorded in research database; 243 are from Thailand and 33 are from other countries. The research database system is developed and publicized into CD-ROM and website titled www.edu.chula.ac.th/thinking.

2) The thinking characteristics found from this study revealed more than 20 types which can gather into 3 groups. Group 1 is about thinking for personal life, those are analytical thinking, critical thinking, and decision making. Group 2 is thinking for social life, those are scientific thinking, problem solving and creative thinking. Group 3 is about other types of thinking, those are Yonisomnasikara thinking, sufficiency economy trend of thinking and mathematic thinking.

3) The average quality of researches is qualified in "good" level and varied in wide range distribution.

4) The average effect size of innovations used in developing students' thinking skills is qualified in "fair" level and varied in wide range distribution.

5) The knowledge about innovations promoting thinking abilities found from this study showed 9 types gathering into 3 groups: Group 1 is thinking for personal life, those are analytical thinking, critical thinking, and decision making. Group 2 is thinking for social life, those are

scientific thinking, problem solving and creative thinking. Group 3 is about other types of thinking, those are Yonisomnasikara thinking, sufficiency economy trend of thinking and content-based thinking. For innovations used to promote thinking abilities, there are 25 types of innovations found from this study which can gather into 5 groups as following: Group 1 is innovations used in learning managements, those are learning and teaching styles, teaching program, activities plan, lesson plan and practice plan of thinking; Group 2 is innovations used in learning processes, those are teaching method, learning management method, learning process and activities plan; Group 3 is innovations used in learning management procedures, those are teaching process of thinking, problem solving process, inquiry process, integration process and community process; Group 4 is innovations used in learning management techniques, those are graphic/mind mapping, strategic lead to read/thinking, self-teaching technique, lateral thinking technique, the six thinking hats technique and cognitive mapping technique; and Group 5 is innovations used in learning management aids, those are computer assistant instruction, thinking activities exercise, concept summarizing document and model technique using news and local folktales.

6) The trends for supporting and developing innovations in promoting students' thinking abilities can summarize as following:

6.1) This study shows the numbers of research on thinking in social life including scientific thinking, problem solving, and creative thinking. For thinking in personal life, there are analytical thinking and critical thinking but there is no study in decision making shown in the research synthesis. About other types of thinking, it includes yonisomanasikara thinking, content-based thinking and sufficiency economy thinking. The study provides appropriate guideline for doing more number of research studies in all three groups of thinking focus on decision making and reflective thinking that can be very useful for educational development in Thailand.

6.2) The finding of research quality evaluation shows the overall quality of researches is qualified in "good" level and varied widely distribution. It indicates that the quality standards of research studies used are different. The suggestion for next study is to emphasize more on research quality and research methodologies in sampling, data collection and data analysis that will help the study denote higher quality.

6.3) The recommendation for next study, the researcher should try thinking innovations to experiment and apply in research, as the result, many types of innovations will be renewed.

6.4) The samples of next study should aim more to in-service teachers, National profession teachers and award teachers developing them to be professional teacher, so that they can help promoting effective and efficiency students.

6.5) There should be a research about the effect of teacher's thinking development on teaching practice behaviors. The variables of the study should be something that can stimulate teacher's thinking, then, make change in teaching procedure and knowledge about students, finally, it can lead to student-centered teaching method which results to students having more effective and efficiency thinking ability and academic achievement.

Recommendation

1) Office of the basic education commission should promote teachers using research innovations and research database as materials to enhance students' ability of thinking in basic education level classrooms, especially in Thinking Classroom Project, Lab School Project, and other projects focus on developing thinking abilities and learning management of teachers and students

2) The results from this study will help teachers in basic education level apply the research innovations suitably with contents, subjects, and levels to their teaching activity to promote students' thinking ability. Moreover, they can enhance their teaching knowledge and professional teaching by doing a research that will support national policy in thinking education, especially in analytical thinking, synthesis thinking, critical thinking, creative thinking and reflective thinking.

3) The executive can utilize the results of this study using in curriculum reform emphasized on students' thinking ability development. Also, the results can be used for policy making about teachers training to use innovations promoting students' thinking ability.

4) The teacher trainers unit consisting of educational service areas, school principals and educational supervisors, can utilize the results of this study to design training sessions, to set up projects for educational staffs development, to design educational curriculum, to set up a training courses, and to help schools developing Thinking Classroom Project.