

META-ANALYSIS OF INSTRUCTIONAL AND ASSESSMENT FOR ENHANCING HIGHER-ORDER THINKING ABILITIES

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Abstract

The purposes of the research were to 1) study the status of the research which studies about instructional and assessment for enhancing higher-order thinking abilities including general, substantive, research methodology and research quality and 2) synthesis the research in an instructional and assessment for enhancing higher-order thinking abilities by meta-analysis. The independent variables were to moderator including general, substantive, research methodology and research quality. The dependent variable was effect sizes of research. Data was collected by employing quality research evaluation form and research characteristic record form. After that data was analyzed by using Glass Method. They were analyzed descriptive statistics and estimated statistics; Independent t-test, One way ANOVA and Scedge method.

The results of research synthesis were as follows:

1. Most of researches were in A.C. 2000 – 2007, from Burapa University and mostly master's degree thesis in the field of Curriculum and Instruction and Education Technology. Instruction focused on Cognitivism Theory, which in high school, and concentrate on the subject matter of science. In the activities of instruction, the instructor mostly acted as a coordinator while in the activities of students, the students mostly acted in small group discussion about real situations. However, technique media and assessment by testing were popularly applied. The one group pretest-posttest design was mostly used which applied purposive sampling method. The hypotheses mostly were direction. Most research applied t-test and had quality in good level.

2. The research characteristics were influence effect sizes were Learning Theory, activities of instructor, activities of learner, situation of learning and assessment. Instructional model for enhancing higher-order thinking abilities should be Cognitivism Theory. In the activities of instruction, instructor acted as a facilitator while students acted in small group discussion about real situation. Assessment by testing together with performance assessment.

Keyword: higher-order thinking abilities, instructional, assessment, meta-analysis

Introduction

Social change into the information age makes contact quickly. Learning is happening all the time both positive and negative. Positive learning makes benefit but negative learning caused threat to society. Thinking is an important mechanism used to learn and discern what is good and bad reasons. It is important to encourage the learners to provide students with the ability to think and apply the idea to capitalize on the good side [1].

The important concept in the development thinking ability is to teaching the students to develop higher thinking skill. It will be successful only if teachers can arrange activities for teaching and assessment, contributing to the students to figure out the answer [2], thus many researchers study the instructional and assessment to develop the higher-order thinking abilities but also lack of research synthesis is concluded that instructional and assessment that would be most effective.

Meta-analysis is quantitative research synthesis which studies the same problem. The unit of analysis is the findings from the research, each adapted to the same standard and taken as the dependent variable. The independent variable is characteristic of research. The results are summarized the research linking reports together. It showed that the effect size of the variables that affect the dependent variable. By synthesizing research results will not be interfered with personal opinions. Another highlight of the meta-analysis is to parse the trend of research on the topic without the research design, data collection several times. Thus concluded that the knowledge of the existing research. It was a good use of research well worth in the investment and guidance for development research that should be implemented in any direction [3].

This research is a research synthesis by meta-analysis. In order to know instructional and assessment of an effective talent development in higher-order thinking abilities to students. The results of this research will be useful in the creation of instructional and assessment to develop higher order thinking abilities.

Purposes

- 1) Study the status of the research which focus about instructional and assessment for enhancing higher-order thinking abilities including general, substantive, research methodology and research quality
- 2) Synthesis the research in an instructional and assessment for enhancing higher-order thinking abilities by meta-analysis.

Methods

This research was synthesized the research by Meta-Analysis that used Glass Method. The sample were 12 experimental or quasi- experimental research reports in A.C. 2000-2011 which studies about instructional and assessment for enhancing higher-order thinking abilities. Those research reports must be reported the values of descriptive statistics and estimated statistics that enough to calculate the effect size values by using Glass formulas.

The dependent variable was effect size indexes of research reports and the independent variables were moderator variables that focus on 4 variables

1) General data of research variables were years, universities or institutions, branches of research and types of research.

2) Substantive of research variables were classes, subjects, activities of instruction, activities of students, medias and assessments.

3) Research methodology variables were research designs, purposive sampling methods, hypotheses and test of statistics.

4) Research quality variable was scored assessment research quality by employing quality research evaluation form.

The research instruments were quality research evaluation form and research characteristic record form.

Data was collected by surveyed the research reports which studies about instructional and assessment for enhancing higher-order thinking from Thai Thesis Database and Thai Library Integrated System and read the research reports in the beginning for checking the substance that enough for synthesis the research by Meta-Analysis that used the Glass Method. After that, read the research reports in details for recorded data of research reports in research characteristic record form and assessed quality research from quality research evaluation form.

Data was analyzed by using Glass Method. The status of the research including general, substantive, research methodology and research quality were analyzed by descriptive statistics like frequencies, percentages, averages and standard deviations and they were analyzed the estimated statistics about distribution of effect sizes by Kolmogorov-Smirnov test founded distribution of effect size indexes was normal curve so that comparison average of effect size indexes by Parametric statistics were Independent t-test and One way ANOVA. If analysis of variance tests were significant then would analyze Post Hoc test by Scedge method because number of elements in each sample groups not equal.

Results

The results of research synthesis were as follows:

1. Most of researches were in A.C. 2000 – 2007, from Burapa University and mostly master's degree thesis in the field of Curriculum and Instruction and Education Technology. Instruction focused on Cognitivism Theory, which in high school, and concentrated on the subject matter of science. In the activities of instruction, the instructor mostly acted as a coordinator while in the activities of students, the students mostly acted in small group discussion about real situations. However, technique media and assessment by testing were popularly applied. The one group pretest-posttest design was mostly used which applied purposive sampling method. The hypotheses mostly were direction. Most research applied t-test and had good quality level.

2. The research characteristics were influenced effect sizes were Learning Theory, activities of instructor, activities of learner, situation of learning and assessment. Instructional model for enhancing higher-order thinking abilities should be Cognitivism Theory. In the activities of instruction, instructor acted as a facilitator while students acted in small group discussion about real situation. Assessment by testing together with performance assessment.

Conclusions

Instructional and assessment of an effective talent development in higher-order thinking abilities should look like the following

1. Instructional and assessment model for enhancing higher-order thinking abilities should be Cognitivism Theory. By learning from the students to take action or do and teachers are responsible for the environment that is conducive to learning and provide opportunities for students to see the relevance of stimuli is a problem with the stimulator. They are invited in result of learning as a result of interaction with the environment. Stimuli in the learning process are that students perceived stimuli and recognition are a critical factors in learning. Learning does not need to start with a trial and error thing. Students may be prudent to solve the problem and resolve it immediately [4-5].

2. In the activities of instruction, teachers should have a major role as a facilitator. This is consistent with the concept of teaching the truth as taught to reduce the lead role in the classroom as a facilitator and to help guide the students to be able to learn by themselves [6] sometimes the teacher may have a role as coordinator for the learning with students.

3. Students should have a role in group activities by students and teachers interaction. Activities which students should take action rather than sitting and listening to lectures. Students should take action both inside and outside the classroom and participate in teaching activities to become fully eager to learn or inaction. Teachers will be the experts for the learners to learn from the implementation to solve complex problems and create new knowledge. Focus on the interaction between the students with collaboration between students and teachers by operational activities to achieve the exchange of ideas between the students [6].

4. Situation should help the students to learn to learn from real-life situations in which students have participated or manually exposed. To help the students to eagerly urge to think about practical teaching and learning activities that would be taught to the most real conditions without having actually completed all the activities [7].

5. Assessment methods should be used in testing together with performance assessment due to higher-order thinking is a process that occurs in the brain that are abstract and not the content. The ability to measure higher-order thinking measure of expression in different ways thought process and gave outcome of thinking. The process of thinking is shown in the form of procedures or steps. The product of thinking is shown in the effect of the formed knowledge generated ideas in works or actions. Therefore, the ability to measure higher-order thinking should not be measured by test, questionnaire or observation form , but should be measured by a variety of methods to measure higher-order thinking abilities it should covered all aspects [8-9].

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