

Development of Holistic Thinking Skill for Secondary School (Mathayom Suksa) Students

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Abstract: This research aimed to develop training activities kits for holistic thinking skill and achievement of learning after training with activities to develop the holistic thinking of students. Sampling group was 40 students who were studying in secondary school. Tools used in this research were 1) four sets of the training activities kits for development of the holistic thinking skill, in total of 16 activities and 2) achievement test of the holistic thinking skill. The training of holistic thinking skill comprised of 8 skills which were observation skill, discrimination skill, classifying skill, ordering skill, interconnecting skill, reasoning skill, integrating skill and knowledge application skill. The training activities kits comprised of many packages; 1 package in power point program, 8 packages in videodisc, 2 packages in multimedia, 5 packages in materials media and job sheet. For the achievement of learning found that posttest scores of the students were higher significantly than the pretest scores at a level of 0.01.

Keywords: Holistic Thinking, Training Activities Kits, Thinking Skill

Introduction

Educators agree that educational system which depends on learning by memory does not develop learner's thinking process but destroy their brain potential. Learners, usually, are accustomed to listen to lecture and rarely have an opportunity to ask and express their opinions. When instructors ask, learners are shy to answer. Learning becomes tense and learners get bored. They only want to finish their class. That's why some ignore learning for lifelong learning[1]. In societies which have numerous thinkers, we found that the strengthening in science, technology, medical health, politics, commerce, and economic have been occurred. Developed societies are interested in this idea and give funds to develop and support by establishing thinking institute. They develop young people to think and develop instructors to improve themselves. People with skills in thinking must be trained by both their parents and instructors since childhood. Systematic thinking will make learners able to think and do as a whole with holistic thinking. Therefore, we as teacher should concern to this strategy in learning..[2]

Research Objectives

- 1) To create a series of training activities which develop holistic thinking skill.
- 2) To compare holistic thinking skill of learners before and after the training.

Research Scope

- 1) Sampling group consisted of 40 secondary school students in Ratchaprachanukrao School II, Noe Klong District, Krabi Province.
- 2) Independent variable was training in thinking skills with a series of activities concerning holistic thinking.
- 3) Dependent variable was score in problem solving which was regarded as an icon of holistic thinking.

4) Time frame for training in thinking skills with 4 main series of activities (16 sub-activities in total) lasted for 29 hours.

Research Methodology

1. Tools

Series of training activities, tests, and practice evaluation were done as follows:

Series of training activities in holistic thinking could be categorized into 4 characteristics: a) observation and differentiation, b) categorization and ordering, c) linking relationship and reasoning, and d) integrating information and applying knowledge. Learners participated in those activities from easy to difficult level. Learners also studied in groups under learning-friendly environments. To illustrate, learners did activities inside and outside classroom; learners did brainstorm to create their work with happiness; researchers and learners had interaction with good relationship; we used various media and activities; learners were appraised in terms of knowledge and thought by 3 steps (Tawee Chaiyachote) [3]

Step 1

- * Introduce an activity with stimulating questions to gain learners' attention
- * Explain activity's objectives
- * Form groups
- * Give them activity guide, media, and instruction

Step 2

- * Learners in each group do activity as assigned and discuss
- * Learners summarize their ideas in their own group

Step 3

- * Learners discuss and present the data to the whole class
- * Instructors and learners summarize their result of activities and knowledge together

The researchers have created 4 series of training activities according to the objectives and 16 sub-activities in total. The training set was examined by experts in order to find out the efficiency of the training set. To find out the efficiency of the test, five subjective questions were given to the group which was not the same as sampling group to participate in these activities, namely 26 secondary school students in Ratchaprachanukrao School II. The t-test had a significant level at 0.01. That meant all five questions could differentiate high and low groups, so the test could be used in this research.

Instructions emphasized on factors affecting thinking development, environment, media, interaction between instructors and learners. These all were important in developing learning process. Moreover, learners were also observed by instructors and peers. With this kind of environment, learners felt familiar and relax as learners' centered. Practice appraisal was done by learners and instructors and learners could express their opinions towards training. Appraisal used approximation scale. There were 3 appraisal sheets: self-appraisal during activity, observation sheet by researcher or instructor, and questionnaire after activity in holistic thinking.

2. Experimentation and Achievement Test

Training in holistic thinking development was a research with quasi-experimental design in terms of one group pretest posttest design. This was done with only one group as shown in Table1:

Table 1 : *Research Process for One Group Pretest Posttest Design*

Group	Pretest	Experiment	Posttest
Experimental Group	T ₁	X	T ₂

T₁ is Pretest on holistic thinking

X is treatment

T₂ is Posttest on holistic thinking

Sampling group consisted of 40 students. The researchers trained them in 5 days, or 23 hours in total. If instruction, pretest, posttest were counted, it would be 29 hours. Training in holistic thinking was done throughout the week.

Operation Results

Media used in order to develop thinking skills were 4 series of training activities, or 16 sub-activities in total. Training details were as shown in Table 2

Table 2 : *Activity Detail*

Activity Title	Activity Details	Image
Introducing thinking development and pre-test	Power Point to introduce training in holistic thinking development and pretest on holistic thinking	
Activity 1 Which bottle what	Training in observing and distinguishing media used which learners could taste, touch and smell	
Activity 2 Which bottle what	Training in observing and distinguishing media used which learners could taste, touch and smell	
Activity 3 Where different	This activity used application to train learners in using eyes to observe pictures with different spots or different from the prototype	
Activity 4 What face shows	A video clip showing 10 faces expression with different feelings in order to practice visual and emotional skills	
Activity 5 What do you see	A video clip showing faces and situations in order to practice visual skill and observe emotion from 8 situations	

Activity Title	Activity Details	Image
Activity 6 Phai's diary	To practice auditory and visual skills and observe, learners looked at maps and listened to the media and then wrote down what they knew	
Activity 7 Mysterious box	This activity used real material to practice direct sensory skills and wrote down what they knew	
Activity 8 Mysterious Geometry	Real material in many geometrical shapes, various colors in order to practice observation, order, and classification skill by using learner's own rules	
Activity 9 What to do with garbage	A video clip to inform learners of how to classify each kind of garbage, to let them observed and throw away garbage the right way, as well as wrote down what they knew	
Activity 10 Hi-tech jigsaw	An application to practice observation, order, as well as classification, e.g. picture of hued colors, real objects, and animations	
Activity 11 Young writer	A video clip to practice observation and order of situations, then linked and wrote a story from picture, sound, and speech	
Activity 12 Left brain helps calculation	Power Point to practice observation, order, and relationship between numbers given from 0-10	
Activity 13 Grow rich with garden	A video clip concerning mushroom farming to practice observation, order, and relationship. Learners will use mind maps to show what they should do to get cost and profit.	
Activity 14 Teens and Drugs	A video clip to practice observation, order, relationship, and application of knowledge by drawing maps of reasons why people were addicted to drugs and how to protect themselves. Moreover, learners had to solve problems when they were persuaded to participate in taking drugs.	

Activity Title	Activity Details	Image
Activity 15 Tsunami	A video clip to practice observation, order, and relationship, along with application of ideas. Learners did mind maps and be given each a tree to do whatever they wanted.	
Activity 16 Your picture frame	Real material to practice observation, order, application, and problem solving, by doing in groups to create a picture frame	
Posttest on holistic thinking and end of training		

Comparisons on Holistic Thinking

To find out the efficiency of training in holistic thinking, five questions were used and scores were analyzed by t-test. Results were shown in Table 3

Table 3: *Comparisons on holistic thinking test*

Score	n	\bar{X}	S.D.	t-test
Pretest	40	18.05	6.70	11.89**
Posttest	40	29.94	6.81	

** P < 0.01

According to the analysis from Table 3 using t-test, it was found that there was a significant difference at the level of 0.01. Pretest’s average score (\bar{X}) and standard deviation (S.D.) were 18.05 and 6.70, respectively. Posttest’s average score (\bar{X}) and standard deviation (S.D.) were 29.93 and 6.81, respectively. This showed that learners had improved their holistic thinking with a significant difference at the level of 0.01.

Evaluation of Training in Holistic Thinking

1. Self-Appraisal

Learners did a self-appraisal after each activity. The evaluation was done in 5 following themes: As for presenting the data to the members in group, namely, courage to express opinions increased after each activity, the average score (\bar{X}) was 4.28 and standard deviation (S.D.) was 0.67; As for participating in group and activity, the average score (\bar{X}) was 4.48 and standard deviation (S.D.) was 0.63; As for finishing tasks in time, the average score (\bar{X}) was 4.43 and standard deviation (S.D.) was 0.60; As for acquiring more knowledge after each training activity, the average score (\bar{X}) was 4.56 and standard deviation (S.D.) was 0.59; And as for cooperation in group, the average score (\bar{X}) was 4.36 and standard deviation (S.D.) was 0.77. As for all themes, there were opinions at a high level.

2. Behavior Evaluation by Researcher or Instructor

Instructors observed their learners and found that all kinds of evaluation were at a high to the highest level. The first evaluation was learner's confidence in presenting, which ranked at a high level. The average score (\bar{X}) was 4.82 and standard deviation (S.D.) was 0.42. The last one was that learner's right operation was at a high level. The average score (\bar{X}) was 4.34 and standard deviation (S.D.) was 0.77. Learner's self-confidence and respect of other's opinion were at a high level.

3. Study of Learner's Opinion towards Overall Training

According to the questionnaires on learner's opinion towards overall training, learners presented that they could apply these thinking techniques with other subjects. The average score (\bar{X}) was 4.70, which was the highest. Learners acquired knowledge from activities. The average score (\bar{X}) was 4.68, which was the second highest. The third highest one was that content was suitable for learners. The average score (\bar{X}) was 4.65. The last highest one was learner's courage to express opinion. The average score (\bar{X}) was 4.48.

4. Observation of Other Behaviors

Learners helped other groups. Poor learners would not express their opinions in group because they were afraid of being laughed at. Female learners do not like to be in group with more male learners. Male learners wrote less than female ones because they thought their handwriting were not beautiful. Learners did not have courage to use computer.

Research Discussion

1. Discussion on Development of Training in Holistic Thinking for High School Students

The training used for this research emphasized on the development of learner's thinking process. There were various activities and media. To illustrate, activity 3 "where different" was used to observe two similar pictures with different spots. Activity 8 "mysterious geometry" allowed learners to learn with real material in all three dimensions. Activity 12 "left brain helps calculation" created by Allen D. Bragdon and David Gamon was used according to learner's age (referred to Jakrit Kanjan) [4]. There were also activities like Tsunami, what to do with garbage, and young writer, which used computer technology to assist creating learning environment.

2. Discussion on Results of Training in Holistic Thinking

2.1 The training to develop thinking followed these 3 steps of learning process:

Step 1 emphasized on gaining attention from learners by questions and inquiry about learner's experience. This complied with Thisana Kaemane[5] which says, "Introduction is a motivation towards learning."

Step 2 emphasized on practice in thinking. Activities were done in group and all must change group. Training in holistic thinking were done by using numerous media and various activities. Learners expressed their opinion over the time.

Step 3 emphasized on evaluating thinking process. The assessment was done to comply with activity's objectives using discussion so that they knew each other. Reinforcement was done by gifts or applause. This complied with Oraphan Pornseema[6].

2.2 The training emphasized on creating learning environment. Learners could express their opinion openly and worked together in group. This increased their personalities and presentation skills. Researchers always encouraged learners to participate in activities, asked questions, and expressed opinions. Familiar environment made learners spent more time on activities and they were happy to work and learned by themselves. Learners developed themselves in all ways.

2.3 Result of training was that learners progressed in thinking. Learner's thinking process after training was higher than the one before training at a significant level of 0.01. Moreover, learners were more enthusiastic. They helped other groups and respected other's opinions. This complied with Tissanana Kaemmanee et al. [5]. Aspects which facilitate thinking are generosity, virtue, curiosity, enthusiasm, thoughtfulness, endurance, challenge, confidence, and mental balance.

Suggestions

1. Suggestions for Trainers

1.1 Trainers should set a corner for media which helps development of learners so that learners can practice by themselves whenever they want.

1.2 Trainers should use computer applications because the tools can interact with learners immediately.

1.3 Trainers should let learners ask questions and always guide them to think according to activity framework.

1.4 Trainers should build relationship in group so that learners feel familiar and relaxed, and express more opinions.

1.5 Trainers should use microphone when there are many learners. If the sound is not clear enough, learners will get distraction and have no attention to trainer. Moreover, learning environment will get worse.

2. Suggestions for Trainees

2.1 Trainees should be able to read and write well. This will make them confident in presenting the data to the group.

2.2 There should be other activities which help increasing confidence, for example, situation where learners can play roles to solve problems.

2.3 Trainee should be instructed on using computer. This will facilitate learning by computer.

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