

# Development of a Model of Reflection Using Video Based on Gibbs's Cycle in Electronic Portfolio to Enhance Level of Reflective Thinking of Teacher Students

Teeraphon Pianpeng and Prakob Koraneekij

**Abstract**—The purpose of this research is to develop the reflection using video based on Gibbs's cycle in electronic portfolio to enhance the level of reflective thinking of teacher students. The model was developed based on the review of literature and the experts' evaluation. Then, it was tested by 21 teacher students, followed by the approval from the experts. Data analysis indicated that there was statistical difference between pre and post test scores at .05 level of significance. The results of this study showed that the model should consist of seven steps as detailed in the article.

**Index Terms**—Electronic portfolio, reflective thinking, video reflection.

## I. INTRODUCTION

Reflective thinking towards learning plays a part in helping the students achieve the goals and realize the purposes of thinking to reach learning targets and bring knowledge for integration. Reflective thinking process arises from training the students to have the skill in thinking reflectively and considering various things carefully by means of causes and effects. As a result, the individuals can review and reflect on their actions, causing the understanding and learning from experience. This leads to development, improvement, solving of various problems [1]. It helps train the students to develop a flair for analysis of their performance, planning, presentation of approach to development, correction and improvement up until planning for applications in practice.

As to evaluation of reflection to examine the students' results towards learning and working, it is possible to assess the classified levels of reflection capability towards the work of students called "level of reflection." Such level of reflection is in the developmentally-orientated form. Besides, there is the presentation of level in which the reflective thinking of learner is. Also, it is feasible to make progress through the stages of reflection process development further [2].

Regarding the use of video as a tool for presenting one's own story or commenting on the work, this is also a way to develop the communication skills of students through video prepared on one's own. According to the explanation

provided by Nawanit Songkharm [3], the educational management by giving students the opportunity to present themselves via video called "digital video" as a medium for reflection promotion in the manner of communicating knowledge and experience from learning through piece of work is helpful in the process of self-reflection. Besides, communicating one's own story will allow the learner to reflect on experience, opinions through expression to help develop skills in various fields.

The work of students, which is stored and presented, is intended for use in the authentic assessment of learners' performance. Electronic portfolios are widely utilized as a tool for storing the work of digital media type. The purposes are to show the evidence of students' progress and opinions of the students about their own learning. In this regard, the students store the work of all kinds according to classification set by the system. Concerning the work stored, the students must also feel that they themselves decide on which work to store. The opinions of learners will allow them to take responsibility for their own learning, which can be utilized in various fields and serve as a channel of developing students in terms of reflective thinking. Moreover, the students' comments are concluded for use in adjusting educational management with the display of results in relation to effective learning.

## II. REVIEW OF LITERATURE

From the outcomes of studying literature and related researches, the information on various issues is presented as follows:

### A. Reflective Model

Reflective thinking is a process of checking and searching for the object of one's interest. It will arise out of stimulation from various experiences of the past and leads to the change of perspectives and ideas to the new ones. Therefore, such reflective thinking process is considered as a context of learning through the process of intellect and attitudes towards actions. Each person can find this from one's own existing experience, leading to the understanding and acceptance of new things. Also, it is considered that reflective thinking is a person's potential for learning, which results in the change of perspectives. It will happen in the manner of a process. One important thing is that reflective thinking must be done straightforwardly. This would result in seeing the information or errors truly, accepting the changes and correction so as to lead to learning the approach appropriate for such given situation.

Manuscript received August 30, 2014; revised September 29, 2014. This work was supported by the T.H. 90<sup>th</sup> Anniversary of Chulalongkorn University Fund (Ratchadaphiseksomphot Endowment Fund) for funding this research.

The authors are with the Department of Educational Technology and Communications, Faculty of Education, Chulalongkorn University, Bangkok 10330, Thailand (e-mail: siesta\_cop@hotmail.com).

This research refers to the reflective thinking process based on the concept of Gibbs [4] that presents a model for developing reflective thinking conducive to continuous learning and development of the self. This model is characteristic of being arranged in a circle called Reflective cycle as follows.

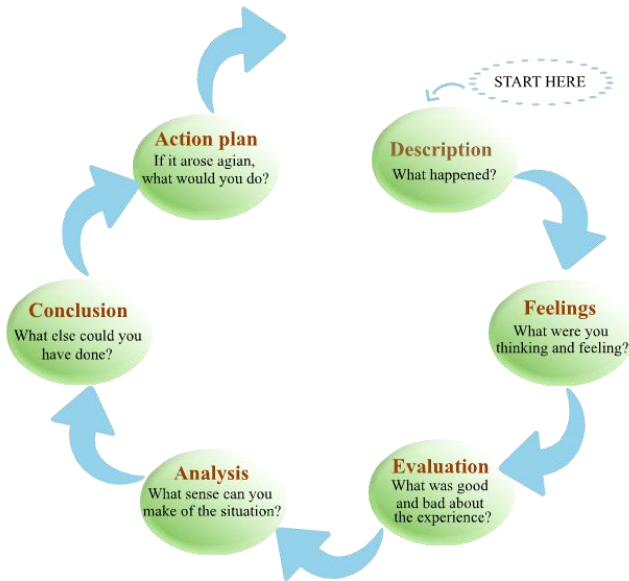


Fig. 1. Gibb's reflective cycle model.

The diagram of reflection cycle based on the concept of Gibbs [3] shows the continuous development of learners' reflective thinking. It comprises six following phases.

Phase 1: Description – It is about specifying the details of the situation that occurs according to circumstances.

Phase 2: Feelings towards situation – Occurrence of thinking and considering the feelings caused by the impact

Phase 3: Evaluation - Assessment of situation as to how it has strength or advantage and weakness or disadvantage

Phase 4: Analysis – Analysis of the situation that happens from existing knowledge or experience so as to lead to new knowledge arising from learning such situation.

Phase 5: Conclusion – Conclusion from analysis of detailed information on various aspects on the basis of existing experience. This causes new knowledge, resulting in the change of perspectives or ideas that are different.

Phase 6: Planning for practice (Action plan) leads to the change of perspectives, ideas, ability to deal with the problem or situation that similarly occurs appropriately.

### B. Video Reflection

The students produced video reflection on their own by using leading questions created by the researchers for reflective thinking in the video. Leading questions are developed from the reflection development process according to Gibbs' reflection cycle model [3]. This is concerned with posing questions about the details of portfolio preparation of the students. The students were asked to answer questions by proposing opinions or feelings towards portfolio. There are nine questions as follows:

1) What is the portfolio that the student prepares? How are the details of preparation? For example, equipment and material media, duration, knowledge used for creating the portfolio and so on

- 2) How does the student have opinions / feelings towards the portfolio prepared?
- 3) What are the strengths and weaknesses lying in preparing this piece of work?
- 4) In relation to this piece of work, what is already good and what should be improved according to the student's opinion?
- 5) What is the student's approach to developing /improving this piece of work further?
- 6) What are the results that occur after development / improvement of portfolio by the student?
- 7) What does the student learn from preparing this piece of work?
- 8) How does the student plan for preparing the portfolio next time so that the subsequent piece of work has better quality?
- 9) What are major goals of working next time?

Then, the learners were allowed to reflect on the questions brought up in the video for dissemination in one's own electronic portfolio.

### C. Electronic Portfolio

The electronic portfolios were used as a tool to support learning and be a part of storing the work of students for presenting the results of reflective thinking by means of video prepared on one's own. Therefore, the researchers studied the literature and researches related to the use of electronic portfolios for storing the work and presenting the results of reflective thinking through video. The students had to create electronic portfolios by using the Blackboard learning management system with 4 parts of components, namely: 1) introduction, i.e. front page, profile page and references page; 2) work and evidence part, i.e. artifacts page; 3) reflective thinking part, i.e. reflection page and 4) assessment part, namely evaluation page.

## III. METHODOLOGY

This research is divided into 2 phases with the aims to (1) develop the model of reflection by using video based on the concept of Gibbs's cycle in electronic portfolios to enhance the level of reflective thinking of teacher students and (2) test the use of reflection model by using video based on the concept of Gibbs's cycle in electronic portfolios so as to enhance the level of reflective thinking of teacher students.

### A. Phase 1: Development of Reflection Model by Using Video Based on the Concept of Gibbs's Cycle in Electronic Portfolios to Enhance the Level of Reflective Thinking of Teacher Students

The research in this phase included the study on literature and researches related to the reflection development process by using video, concept of Gibbs's reflective cycle, electronic portfolios and level of reflection for use as guidelines on the design and development of reflective thinking model by using video. Subsequently, this was submitted to 5 experts for assessing the appropriateness of the model and providing suggestions.

### B. Phase 2: Test on Using the Model of Reflection by Using Video Based on the Concept of Gibbs' Cycle in

*Electronic Portfolios to Enhance the Level of Reflective Thinking of Teacherstudents*

The representative sample used in this research consisted of 21 teacherstudents. The duration of experiment was 8 weeks. The tools used in this research included electronic portfolios, learning activities arrangement plan and reflection video. The instruments used for data collection included form of assessing portfolios for presentation, form of evaluating the reflection results by using video and form of evaluating the reflection level. Data was analyzed by determining the arithmetic mean, standard deviation and t test (t-test for dependents).

The quality of tools was assessed by experts according to the quality level in the manner of 5-level rating scale. According to evaluation results, the model of electronic portfolios had the average of 4.63 (4.5 - 5.0 = Most Suitable), the reflection model by using video had the average of 4.14 (3.5 - 4.49 = Very Suitable) and the assessment form of reflection level had the average of 4.49 (3.5 - 4.49 = Very Suitable).

IV. RESULTS

The findings of research on the development of reflection model by using video based on the concept of Gibbs’s cycle in electronic portfolios to enhance the level of reflective thinking of teacherstudents reveal the following:

*A. Phase 1: Results of the Development of Reflection Model by Using Video Based on the Concept of Gibbs’ Cycle in Electronic Portfolios to Enhance the Level of Reflective Thinking of Teacherstudents*

From the study of literature and related researches, the process of reflective thinking development by means of video based on the concept of Gibbs’s cycle is divided into 7 stages, namely

- 1) Concrete Experiences: Learners could apply knowledge linked from existing experience in preparing portfolios and could describe, make comments or express the feelings towards the preparation of portfolios.
- 2) Details Consideration: Students could consider the details of portfolio preparation by identifying the problems caused by working and could propose guidelines for developing the preparation of portfolios to have higher quality. Besides, they were able to analyze strengths/ weaknesses of the preparation of portfolios, plan and determine the methods of solving problems as well. Students were able to offer guidelines on developing or improving the portfolios further appropriately. The purposes are to plan the improvement of working to be effective and ensure the quality work further.
- 3) Proposal Development: Students were able to propose guidelines for problem-solving or various techniques/ methods for use as approach to development of working. This will allow the preparation of portfolios next time to have greater quality.
- 4) Plan & Choose: Learners could plan for working with quality by selecting guidelines on problem-solving or techniques / methods with most appropriateness for use in developing the preparation of portfolios next time.
- 5) Action: Learners were able to perform according to the

methods of developing the work selected by following such techniques / methods so that the preparation of portfolios had more quality.

- 6) Evaluate & Conclude: After having implemented the methods of developing the work as planned, the learners were asked to report the performance and learning outcomes from working to be additional learning experience.
- 7) Implement & Improvement: Learners have already built the knowledge from planning based on techniques / methods of developing the work properly. This would create guidelines on the development of work next time to have more quality with the setting of attainment targets to enable the achievement of the specified goals.

The results of evaluating the reflection development process by using video based on the concept of Gibbs’ cycle according to quality levels of 5-level rating scale by 5 experts are as follows:

TABLE I: EXPERTS’ EVALUATION SCORES OF PROCEDURE OF REFLECTION DEVELOPMENT BY USING VIDEO

Phase of Gibb’s Reflective Cycle Model	Procedure of reflection development by using video	Mean ( $\bar{X}$ )	Interpretation
Phase 1: Description	Step 1: Building experience	5.00	Most Suitable
	Step 2: Review and analysis of causes of problems and approach to development	4.20	Very Suitable
Phase 3: Evaluation	Step 3: Proposal of guidelines for problem-solving and the ways of development with appropriateness	4.20	Very Suitable
	Step 4: Planning and determining the methods of problem-solving	4.80	Most Suitable
Phase 4: Analysis	Step 5: Conduct of problem-solving	4.80	Most Suitable
	Step 6: Evaluation and finding conclusion	4.60	Most Suitable
Phase 6: Action plan	Step 7: Bringing problem-solving guidelines for deployment	4.60	Most Suitable
<b>Total Average</b>		<b>4.60</b>	<b>Most Suitable</b>

Note: 4.5 - 5.0 = Most Suitable, 3.5 - 4.49 = Very Suitable, 2.5 - 3.49 = Suitable, 1.5 - 2.49 = Less Suitable, 1.0 - 1.49 = Not Suitable

From Table I, the evaluation scores of Procedure of reflection development by using video from five experts’ scores were at “Most Suitable” level, which indicated that most of the experts strongly agreed with using video reflection based on Gibbs’s cycle in electronic portfolios to enhance the level of reflective thinking of teacher students. Besides, the experts believed that this proposed model can be used in a real context. The illustration of the proposed model is shown in Appendix A.

According to the study on literature and related researches, the design of electronic portfolio structure based on the Blackboard learning management system and setting of pages in electronic portfolios for presentation of reflection video are as follows:

- 1) Introduction: This is a part of showing the first page of

electronic portfolio, the student's personal information and list of references related to the student, which are presented in one's own electronic portfolio, including Home page, Profile page and References page.

- 2) Products of work and evidence: It is a part of storing the work and presents the work of student, i.e. Artifacts page.
- 3) Reflective thinking: It is a part of communicating the work of reflection video such as providing details, relating experience, expressing comments and feelings towards the preparation of each student's portfolio by using the video-based reflection process according to the concept of Gibbs' cycle, which comprises Reflections page.
- 4) Evaluation: This is a part of overall evaluation of electronic portfolios for presentation, which consists of Evaluation page.



Fig. 2. Example of student portfolios page.

**B. Phase 2: Test on Using the Reflection Model by Using Video Based on the Concept of Gibbs' Cycle in Electronic**

**Portfolios to Enhance the Level of Reflective Thinking of Teacher Students**

The results of analyzing the scores of reflective thinking by means of video before and after test with the use of analysis comparing the average, standard deviation and T-test are shown in Table II

TABLE II: THE REFLECTION USING VIDEO BASED SCORES WITH ANALYSIS OF DATA BY USING MEAN, STANDARD DEVIATION, AND T-TEST DEPENDENT

The reflection using video based scores	scores	(X)	S.D.	T	Sig.
Pre-test	50	24.29	7.895	8.876	0.000*
Post-test	50	41.81	5.604		

\*\*  $p < .05$

From Table I, the experimental results indicated that the subjects had video reflection post-test mean scores higher than pre-test mean scores at 05 level of significance.

Results of evaluating the representative sample by classification according to the levels of reflection with comparison between pre-test and post-test are shown in Diagram 2.

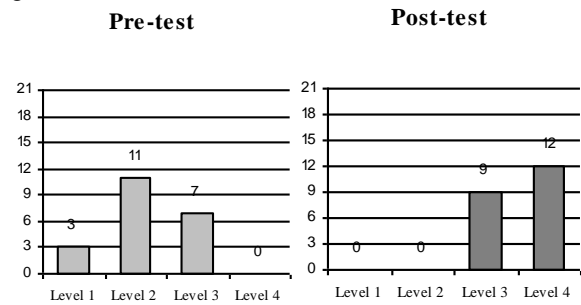


Fig. 3. Results of comparing the subjects of representative sample according to reflection levels before and after the experiment.

According to Fig. 2, the results of comparing the subjects of representative sample by classification according to reflection levels reveal the following:

Before the experiment, the subjects of representative sample are mostly in level 2 with a number of 11 persons, followed by being in level 3 with a number of 7 persons and being in level 1 with number of 3 persons while the representative sample is not found in level 4.

After testing, the subjects of representative sample are mostly in level 4 with a number of 12 persons, followed by being in level 3 with a number of 9 persons whereas the representative sample is not found in level 1 and level 2.

**V. CONCLUSION AND DISCUSSION**

The results of this study revealed that the reflection model by using video based on the concept of Gibbs' cycle in electronic portfolios enhanced the level of reflective thinking of teacher students due to the work preparation process for presentation in electronic portfolios. Also, the students produced reflective thinking by using video based on the concept of Gibbs' cycle towards preparation of portfolios. In this regard, the students would gain knowledge about preparation of portfolios by learning from educational activities in courses. As a result, the students learned the concept of Gibbs' cycle in a sequence of steps. They started to perform until being able to explain the details of the work

(Description), express the feelings towards the portfolios prepared (Feelings). This led to the process of reflective thinking towards preparation of portfolios [5]. After completing preparation of the portfolios, the students would be assessed in terms of reflective thinking (Evaluation). The assessment of reflective thinking is a tool that stimulates the learning development of students. The reason is because the learning experience that occurs is significantly linked to the students' learning goals [6]. Reflective thinking by means of video is a tool that allows the students to develop a flair for analysis towards work (Analysis), which reflects the functioning processing each step. It is possible to learn the problems along with the development process by showing the results of performance afterwards. The outcomes of reflection towards portfolios by means of video of teacher students would lead to the guidelines for conclusion (Conclusion) and planning to work next time (Action plan) so as to create the new knowledge of one's own. Thus, this enables the deployment of knowledge created as guidelines for further improved working [7]. The results of judging higher reflection levels of students indicate the development of reflective thinking towards portfolios. The effects of video would allow the students to have confidence in reflection with ability to perform activities and review existing knowledge related to higher learning, hence the desire for advanced learning too. In terms of self-confidence as a consequence of one's own reflective thinking via video when being communicated through the presentation of electronic portfolios, this opens a channel of presenting the portfolios resulting from the students' learning on their own. Electronic portfolio is a part of creating a space for storing the work. Access to data, updating information and presentation of the students' work are done through different designs of personal portfolios [9]. Moreover, this is a way of showing the information recorded or stored as evidence to indicate or confirm the study results and the progress achieved in various fields of the students [10].

APPENDIX

Appendix A: The Illustration of the proposed model



Fig. 4. The Illustration of the proposed model.

Appendix B: View all student portfolios page



Fig. 5. Example of home page.



Fig. 6. Example of Home page.

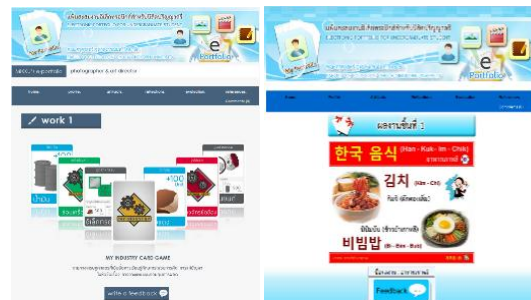


Fig. 7. Example of artifacts page.



Fig. 8. Example of reflections page.

ACKNOWLEDGMENT

The researchers would like to thank The 90<sup>th</sup> Anniversary of Chulalongkorn University Fund (Ratchadaphiseksomphot Endowment Fund) for funding this research.

REFERENCES

- [1] B. J. Dixon, "A formative experiment investigating the use of reflective video journals to increase high school students' metacognition," Ph.D. dissertation, Dept. ED., University of San Diego and San Diego State University, US, March 2009.
- [2] D. Kember, J. McKay, K. Sinclair, and F. K. Y. Wong, "A four-category scheme for coding and assessing the level of reflection in written work," *Assessment & Evaluation in Higher Education*, vol. 33, no. 4, pp. 369-379, 2008.
- [3] N. Songkram, *Creating the Digital Video & Digital Storytelling for Instruction in the Digital Age*, Bangkok, TH: Chulalongkorn Univ. Printing, 2011, pp. 98 – 104.
- [4] G. Gibbs, *Learning by Doing. A Guide to Teaching and Learning Methods*, FEU, London, 1988.
- [5] G. Cheng and J. Chau, "Digital video for fostering self-reflection in an ePortfolio Environment," *Media and Technology*, vol. 34, pp. 337-350, December 2009.
- [6] M. Turpin and J. Higgs, "Clinical reasoning and evidence-based practice," *Evidence-Based Practice across the Health Professions*, pp. 300-317, 2010.
- [7] Y. Pomee, "Effects of thinking enhancement program using news and current issues in daily life in social studies, religion, and culture learning area on reflective thinking ability of fifth grade students," M.S. thesis, Dept. Edu Tech and Commu., Chulalongkorn Univ., Bangkok, Thailand, 2010.
- [8] R. H. Shroff, C. Deneen, and E. M. Ng, "Analysis of the technology acceptance model in examining students' behavioural intention to use an e-portfolio system," *Australasian Journal of Educational Technology*, vol. 27, no. 4, pp. 600-618, 2011.
- [9] LIC, Chulalongkorn Univ., *Electronic Portfolio*, Bangkok, TH: Chulalongkorn Univ. Printing, 2011, pp. 1-24.
- [10] P. Koraneekij, "Effect of levels of learning ability and types of feedback in an electronic portfolio on learning achievement of students in electronic media production for education subject," Dept. Edu Tech & Commu., Chulalongkorn Univ., Bangkok, Thailand, 2009.



**Teeraphon Pianpeng** was born in 1987 in Trat Province, Thailand. In 2010, he received the B.Ed. degree in elementary education from Srinakarinwirot University, Bangkok, Thailand. He worked for two years at Watkireewiharn (Somdejphrawannarat Auppatham) School, Trat Province, Thailand. Afterwards, in 2011 he continued the study for a master's degree in educational technology and communication program, Faculty of Education, Chulalongkorn University. During the study, he served as a teaching assistant of the Learning Innovation Center, Chulalongkorn University relating to the use of blackboard learning management system for staff and students on campus. Also, he conducted the research on the use of electronic portfolios for educational management in various courses, namely project study in educational technology, application of computer packages for education, designing web-based instruction, computer based educational printed material production, educational technology and information and computer assisted instruction authoring systems. He has become an expert in the field of creating and designing electronic portfolios for use in learning and presentation of the students' portfolios through LMS system.



**Prakob Koraneekij** was born in Chonburi Province, Thailand. In 1997, he received the Ph.D. degree in educational technology and communication program, Faculty of Education, Chulalongkorn University. From 1988 to 2002 he was teaching secondary school student technology class in Chulalongkorn University Demonstration Secondary School. Afterwards, in 2003 he was an educational technology lecturer in the Department of Educational Technology and Communication at the Chulalongkorn University. During that time he also conducted the research on the electronic portfolios for educational instruction. His research interests are in an effect of levels of learning ability and types of feedback in electronic portfolio on learning achievement of students in electronic media production for education subject and development of blended e-learning model using online interactive reflective learning logs to enhance faculty of education students' inquiring mind and retention at Chulalongkorn University.