

The Activity Model and Components to Support Collaborative Learning Using JIGSAW Technique on Computer Online System

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ABSTRACT

This research aims to study the activity model and components that support collaborative learning by mainly using the JIGSAW technique. This technique could be used in the knowledge matching method as well as the self-studying method. In the first phase, the Delphi technique is examined to be the research instrument. Data collection was gathered 3 times from 28 specialists in 17 universities where educational curriculums are available. The data were gathered and synthesized in order to design the model components. The result revealed that the following components were vital to support JIGSAW based on learning activities; (1) home group: using round table technique, (2) expert group: using structure problem solving, and (3) evaluation process: using teams games tournament technique.

Keywords

Collaborative Learning, JIGSAW, Round Table, Structure Problem Solving, Teams Games Tournament

1) INTRODUCTION

1.1) Background and Significance of the Problem

Learning significantly composes of both learners and learning. A number of various techniques, such as learning using different levels of learners or between friends and friends, self-learning and learning along with technology supports, are applied in order to

support learning (Yun and Somchai, 2003). It is obvious that learning should be arranged in well-planned stages in order to assist learners to gain knowledge of provided lessons. It can be claimed that everyone has potential in self-learning (Thisana et al., 2002). A class management is usually limited to teaching and class schedule; in addition, teachers are the center of classrooms. Moreover, teachers also absolutely empower the class management and usually emphasize a memorization method in teaching. This leads to restrict students from analytical skills, opinion sharing and self-learning (The National Education Commission, 2000). Problems in class management that discourage students to think, practice and solve problems cause students lack confidence, struggle with joining class and then hinder knowledge sharing from groups (boonfirm, 2003). Self-learning may cause learning obstacles leading to the feeling of isolation, the lack of joining activities and the deficiency of reinforcement in group working (haawke, Schwemmer, Haake, 2006). Class management focusing on memorization rather than critical thinking and practical learning necessarily needs adjustments that assist students to enhance their learning efficiency. Team learning and group processes may develop students' communication skills and problem solving skills in interpersonal relationship building and self-learning. Therefore, team learning may be an appropriate choice of learning (Waraporn, 2000).

Team learning shares the common characteristics with the collaborative learning in

the sense that learners are divided into groups or small teams then working in collaboration for achieving ultimate goals (Slavin 1987; Ref to Waraporn, 2002). The degree of learning success depends on not only learners but also collaborative learning skills which improve students' behavior and attitudes toward study achievement (McManus, 1997). Activities encouraging students in classroom participation aim at improving the critical thinking skills, self-knowledge-building skills and teamwork skills of students (Thitiporn, 2004).

Teachers play an important role in forming preferable graduates. This forces the teachers to change their role from knowledge providers to be learning supports in order to assist students in maximize their potentials. (Chalerm, n.d.). Although a number of collaborative learning methods is applied in classroom teaching, a well-known and highly accepted technique is an activity management that includes jigsaw concepts into group activities (Narin, 1999). Jigsaw technique, developed by Elliot Aronson, affects students to have an attraction for learning contents and enhancing perception skills (Turk, Brineand, Kanev, 2006). Moreover, jigsaw technique, which is a greatly efficient teaching method, consists of challenging problems, participating student, and sharing their own opinions and ideas (Maritland, Latourelle, Valenti and Bookman, 2001). Jigsaw technique immensely emphasizing fundamental interactions among students provides advantages of student independence, group learning and multiple levels of learning (Kanokporn, 1997). In addition, the jigsaw technique encourages students to efficiently work in collaboration, to improve teamwork skills in problem solving. Furthermore, it also promotes students' self-responsibility and group responsibility leading to knowledge sharing among students with different level of learning abilities. Using the jigsaw technique, all students have a chance to take turns to be a leader along with learning social skills (Suwit and Orathai, 2002).

An objective of higher education is to build student intelligence. After processes of knowledge exploration, thoroughly understanding in theory and practical

knowledge including working attitudes, students will be formed themselves to be wisdom concentration (Paitoon, n.d.). At the present, called the information age, tremendous data and information are readily available for student to investigate and explore. It can be seen that education currently is not restricted into a classroom and also teachers are not only main information providers. Consequently, students play the most important role in learning processes (Anan, n.d.). The use of information technology becomes an essential component in operating a number of systems as so to the educational systems which have taken information technologies to improve processes (Yun and Somchai, 2003).

For example, the Internet which is a supremely efficient worldwide computer networks has been extensively applied in learning and teaching methods (Waraporn, 2002). The Internet also gives opportunities to students to interact with teachers and fellows for the purpose of learning at any time and any places. Appointment arrangements, discussions via distant conferencing and video conferencing are excellent examples of the Internet used in educational systems. Students are able to learn contents and participate at their own available time through email, bulletin board systems and Listserv which support interactions between a student and a student, between a student and a group and between a group and a group (Woranut, 2001). Computer Supported Collaborative Learning (CSCL) is a use of technologies for supporting several students to simultaneously learn along with facilitating students in group communication, information exchange, collaborative working via computer networks (Hsiao 1996: 1 ref to Wittaya, 2006). Accordingly, it can be claimed that online collaborative learning is the most popular learning method (Kao, Feng, Kuo: 2006).

As mentioned above, the researchers are interested in studying and congregating experts' opinions in relation to the learning management that supports collaborative learning mainly using Jigsaw technique via online computer networks. The Delphi technique is examined to be a research instrument for aggregating data from 28 educational experts working in 17

universities in order to extract experts' points of view. The result of this research may yield the framework for developing appropriate learning activities.

1.2) Objectives of the Research

The followings are objectives of the research

1.2.1 *In order to analyze a model of learning activities that support collaborative learning by mainly using Jigsaw technique through an online computer system along with Delphi technique with educational experts.*

1.2.2 *In order to synthesize a model of learning activities that support collaborative learning by mainly using Jigsaw technique through an online computer system.*

1.3) Scope of the Research

The scope of this research will be described below:

1.3.1) *This research applies Delphi Technique to collect points of view from 28 educational experts among 17 participating universities in order to study an activity model supporting collaborative learning by using Jigsaw technique via an online computer system.*

1.3.2) *The main point of this research focuses on activities supporting Jigsaw technique in the Home Group and the Expert Group in conjunction with the team tournament technique.*

2) RESEARCH METHODS

2.1) Population and Sample

Research population is a group of educational experts who have experience not less than five years in government universities where Education and Educational Science degrees are available. The population can be classified into three groups which are 1) experts in activities supporting collaborative learning, 2) experts in Jigsaw technique and 3) experts in online teaching systems. The population containing 28

educational experts is specifically selected from 17 public universities.

2.2) Methods and Materials of the Research

Methods and materials used in this research are

2.2.1) *five informal interviews for collecting ideas regarding Jigsaw technique*

2.2.2) *a design of learning activity by creating questionnaires to aggregate the points of view from 28 educational experts working in 17 public universities. With the use of Delphi technique, the data collection was arranged in three phases.*

Firstly, open-ended questionnaires were sent to the population to encourage experts to extremely express their own opinions with regard to Jigsaw technique and collaborative learning supporting the effective Jigsaw technique. At this phase, the experts suggested totally 28 collaborative learning techniques and five competitive techniques.

Secondly, the synthesized data from the first phase demonstrated that Jigsaw technique can be categorized into two groups which are the home group and the expert group. Additionally, the selected research instrument is the questionnaire estimation ratio with Likert five-level data collection. As a result, data obtained from the first phase were synthesized to form the questionnaire for experts to pinpoint each issue (shown in Figure 1).

Use of collaborative learning integrated with Jigsaw	Home Group					Expert Group				
	5	4	3	2	1	5	4	3	2	1
1. Round Robin										
2. Round Table										
3. Send A Problem										
...										
28. Brainstorm										

Figure 1: Questionnaire Estimation Ratio

Thirdly, the questionnaire was similar to the one used in the previous phase. However, median, interquartile range (IR) and answers from each expert were included. Then, the newly created questionnaire sent back to each expert in order

to obtain confirmations and validations (shown in Figure 2).

Collaborative learning using Jigsaw technique including median range	Home Group					Median (Mdn)	Interquartile Range (IR)
	5 Highly Agree	4 Much Agree	3 Agree	2 Disagree	1 Highly Disagree		
1. Round Robin						4.03	0.87
2. Round Table						4.07	0.96
3. Send A Problem						3.78	1.62
....

Figure 2: Questionnaire sent to the experts for validation.

2.2.3) synthesizing and summarizing the teaching model are the process of gathering all experts' opinions to analyze the inclusion and then calculate the median and the interquartile range in order to form the learning activity model

3) RESEARCH RESULT

3.1) Results from collaborative learning activities principally using Jigsaw technique

3.1.1) General concept of Collaborative Learning using Jigsaw Technique.



Figure 3: Jigsaw Technique Model

- 1) Home Group: Teachers separated students into groups consisting of four to six members. Each member was assigned to different contents for self-learning.
- 2) Expert Group: Members who are assigned to the same topics from every group gathered to study together.
- 3) Home Group: Members returned to their group to discuss and clarify contents they were assigned.
- 4) Class discussion: All members discussed the contents in order to summarize the effect of learning.
- 5) 5) Assessment: Teacher evaluated the learning result of each person.

3.1.2) An activity supporting Jigsaw technique for Home group from ideas of the experts is the Round Table technique that members share their own opinions by recording discussed issues.

3.1.3) An activity supporting Jigsaw technique for Expert Group from ideas of the experts is the Structure Problem Solving technique which teachers emphasize the critical thinking method and encourage the problem solving method step by step.

3.1.4) An activity supporting group competition from ideas of the experts is the Team Games Tournament technique which separates students into groups depending on their own abilities.

3.2) Activities supporting collaborative learning mainly using Jigsaw technique

According to the experts' opinion relating to activities supporting collaborative learning principally using the Jigsaw technique, the researchers analyzed and then synthesized a model from data collection from experts using the Delphi technique to develop components for significant activities (as mentioned in 3.1). The researcher also synthesized obtained ideas and opinions to create a collaborative learning model using the Jigsaw technique (as shown in Figure 4).

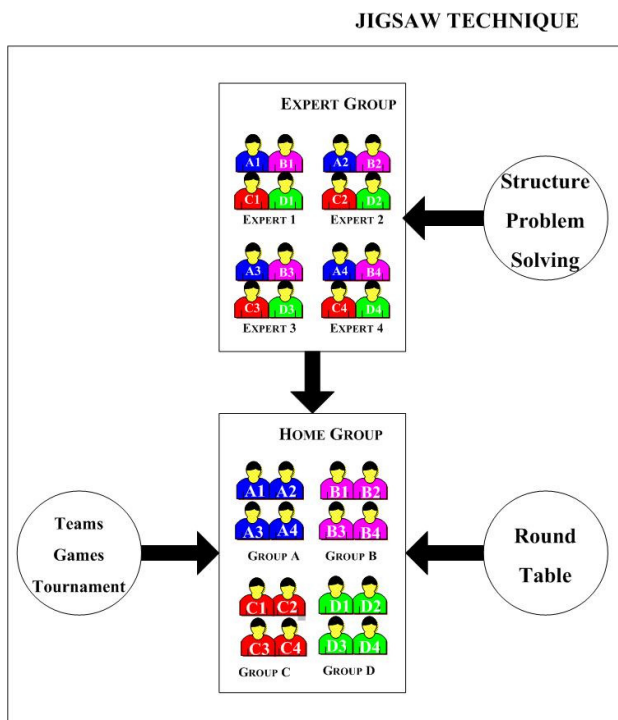


Figure 4: A model supporting collaborative learning by using Jigsaw

3.2.1) Activity in Expert Group

This procedure concerns with the process of Structured Problem Solving. Members from all groups, who are assigned to the same study topic, work in collaboration for understanding documents and exploring additional information related to their own area. After that, each member cooperatively summarizes the assigned topic to ensure that every member shares the knowledge and understanding in the contents. Then, each member returns to their own home group in order to explain and discuss the summarized contents with other members in their home group.

3.2.2) Activity in Home Group

This activity continues from the activity in 3.2.1. After all members return to their home group, they describe and clarify the knowledge they obtained to other members of the group by using the round table technique.

3.2.3) Activity in Team Games Tournament

This activity also continues from the activity in 3.2.2. After group discussion, evaluation of

each member is arranged by applying the team game tournament technique which categorizes students into groups depending on their learning ability such as excellent, average and below average in order to take a test. The test scores from all members in each group will be accumulated to be the group score afterward. According to the synthesizing experts' opinions acquired from the questionnaire, the model shown in Figure 4 was created.

4) SUMMARY

This research aims at investigating activities supporting collaborative learning using the Jigsaw technique via an online computer system in conjunction with the Delphi technique. The result revealed that an activity supporting Jigsaw technique for the home group is the round table technique. Moreover, the structure problem solving technique seemed appropriate for the expert group whereas the teams games tournament is more suitable for the group competition activity.

An interesting study in the future will be an investigation of activity conformable with contents in order to develop a learning activity model then evaluate with the actual teaching through e-Learning system. The study may apply in order to compare a learning efficiency between a typical teaching class and a model-developed class. Then the satisfaction of both students and teachers will be subsequently assessed.

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