The Comparison of Learner's Learning Achievement in Principles of Management Subject between Using Traditional Teaching Method and Cooperative Learning Method by Using Jigsaw Technique

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Abstract— **National Education Act 1999 Section 22 stated that all students should be capable of learning and self-development. Meanwhile section 23 – 24 said the education should encourage their relationship with society, community, national and global communities. Meanwhile teachers had to set up the atmosphere and learning environment and activities in line with the interests and the aptitudes of the students. It should provoke the system thinking skill and dare to face with the situations.**

During the traditional teaching of the BUS-109 Principles of Management in the second semester in 2014, found that students lack motivation in learning, always absent from the class and lack of cooperative learning. They act as individual learning and sometimes they did not hand in their homework. They cannot recall when they learn individually. As the result, the new way of teaching method that would solve for these problems is required. After reviewing the literature, found that cooperative learning method by using jigsaw technique is a very interesting method that could be applied to solve problems than traditional teaching method. Therefore, the jigsaw technique would be used in this experimental research. The population and samples were Thai-Nichi Institute of Technology (TNI)' students who enrolled BUS-109 Principles of Management in the second semester in 2015, two sections for 35 each in control group and experimental group, amounted to 70 students. Research tools are pre-test, post-test and lesson plan. Analytical statistics are frequency, mean ($\bar{x}$), standard deviation (σ) and 60%-standard score pass.

After the experiment, there is a statistically significant difference at the level of .05, which was found in the post-test of the experimental group, which used jigsaw technique teaching method ($t = 17.060$, $p < .05$). A comparison of the post-test scores indicated that learning method by using jigsaw technique enhanced and promoted students' performance in learning BUS-109 principles of management. The average score in the experimental group (J) is higher than the control group (T) ($\bar{x}_J = 8.63$, $\sigma_J = 0.88$; $\bar{x}_T = 6.71$, $\sigma_T = 1.38$). This shows that Jigsaw teaching method can create students' intrinsic motivation in the activities. They are more responsible in social responsive as well as more communication and participation in the classroom than traditional teaching method.

Keywords— **Learning Achievement, Traditional Lecture Teaching Method, Cooperative Learning Method, Jigsaw Technique**

I. Introduction

At present, the pace of the technology change has enhanced the effective communications between senders and receivers. Even the education, technology especially in both hardware and software has been used as the media in teaching and learning. National Education Act 1999 section 22 stated that all educators can learn what they need in order to help for their self-development. So, student-centered is emphasized. Meanwhile, section 24 aimed at the learning process and recognized the individuals' difference. In addition, it is expected that learners could apply their knowledge in solving problems and learn from that direct experiences. Except that the environment rearrangement, additional educational media and facilities to help learners are become essentials.

In the past, the principles of management subject used traditional lecture teaching method during the second semester in 2014 as normal. At that time, 21.43% of students who enrolled in the course, their learning achievement were under the 60%-criteria pass or below "C". Meanwhile, various theories are the majority of this subjects, which causing students bored and hard to understand in the context. In addition, most of the students may not understand what they learn in the context of the subject.

From the last students' teaching evaluations, some said that they lacked incentive and motivation in learning for this subject. They did not want to attend. As the result, they always absent from the class and thought that they can read book by their own. As mentioned, the new way of teaching that needs for more cooperation in learning, sharing ideas and experience among students within a short period of time is required. One of the most effective method is the cooperative learning by using jigsaw technique to research for this study. The activities in the jigsaw technique will promote student-centered in cooperative way. They can work together in group and sub-group in order to reach to the goal setting while sharing their ideas, knowledge and experiences among peers. [8] In addition, this technique also promotes social learning and analytical thinking because they have to work interactively instead of individual. They are free in sharing their knowledge or ideas about what they have learnt from others. Meanwhile, the jigsaw technique can motivate students while increasing their enthusiasm to work with others. This is for the active but not the passive learners.

II. Literature Review

A. Learning achievement

Learning achievement is the use of knowledge or skills acquisition that are measured by the subject matter, usually measured by test scores. The teacher examine the score after testing in the class, which is an indicator for gaining knowledge. Meanwhile, the learning achievement can be measured by capabilities or competency of students after learning in the subject matter. It is the student success level in learning. Their knowledge can be expressed from the indicator of scores obtained from the results of tests on a tested subject. [6] In conclusion, learners' learning achievement can be measured by capabilities or competences of the learner in learning the subject matter which are shown by score. So, the level of student success in learning the subject matter that are expressed in the form of scores can be the indicator to measure that they are success for failure after they learn the subject matter in the classroom. [19]

B. Traditional teaching method

The traditional teaching is the teaching process that teacher is the center of learning and takes the flexible in teaching. Teachers supervise the whole teaching activity and direct their students to the learning objectives of the subject. Teacher will provide all contents, explains and lectures in the class, aiming at the bulk of learners. Teacher cannot take care of every students in class who has different background or basis and departed from real life. Normally, this is the one-way communication from teacher direct to students. However, this method ignores the initiative and potential of the students. Therefore, students are in a passive position. The traditional teaching methods have always focused on the lecture-based methods in which the students are passive recipients of knowledge. [1], [8], [9]

In conclusion, the traditional teaching is the way that teacher direct their students to the point obtained from teacher. Teacher is the center of learning. Students are passive learner because they just listen to or act as teachers direct to their subject matter. Teachers may ignore or do not react to the different students' background or basis.

C. Cooperative learning method

Cooperative learning is a well-documented pedagogical practice that promotes academic achievement and socialization, yet many teachers struggle with implementing it in their classes. [7] Cooperative learning creates an interactive classroom for all students. This interactivity may alleviate the challenges faced by lecturers and may assist in achieving other organizational objectives. [1] The success of cooperative groups depends on positive independence and supportive interaction. It is important that the learning environment be designed in a learner-centred style to ensure that all students have an opportunity to contribute to their team. [8]

This mean that students will depend on each other interactively in social context, idea and information sharing. The cooperative learning can create social learning, achievement in learning outcomes both individually and group. As the result, the cooperative learning can lead to learner's learning achievement.

In conclusion, Cooperative learning is the social learning context obtained from working together in group. Students will share what they have learnt from resources individually and help each other to achieve the overall learning outcomes. The learning support a student-centred style to ensure that all students have an opportunity to share or exchange what they learn among their peers.

D. Jigsaw technique teaching method

Jigsaw is a cooperative learning technique that students can share their knowledge or whatever they find out and work in group. This technique supports students to reduce their misunderstanding in learning context. Students are motivated and enthusiastic about their jobs. They will get the benefits from knowledge sharing both in and out of the classroom. [3] The characteristics of the Jigsaw technique is the high level of interdependence that is generated when the larger classroom is divided into smaller subgroups. Each subgroup (called the expert group) focuses on the sub-topic of the overall assignment. Each member in the group will become the expert for their assigned sub-topic. Next, new subgroups are formed which comprising of an expert from each expert group. The expert would explain what they have learnt or knew in their assigned topic from their expert groups to compose for overall picture of the assignment. The students are interdependent because the assignment cannot be completed without contributions from each student. [2], [14], [15] As for the qualitative findings in the study, students often used the expressions that Jigsaw technique enhanced the achievement and self-confidence, developed cooperation and interaction, activated students and arouse the idea of searching. [10] Face-to-face interaction, individual accountability, cooperative social skills, positive interaction and group processing are the basic elements of this application. [8]

In conclusion, this teaching method is the pedagogy based on jigsaw. Individuals search for knowledge and share among peers in their group. Individuals are responsible for sub-topic of the overall topic assigned by the team or home group, which they will be the expert. They go outside the home group to acquire knowledge by discussing and sharing information with others in subgroup or expert group. Finally, they come back to their home group and tell or share or discuss what they get from the expert group to peers. This technique, students can effectively understand the learning context because they are motivated and enthusiastic about their jobs.

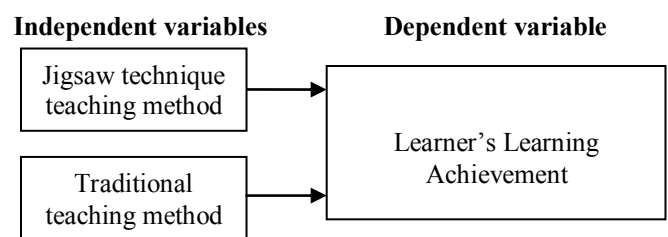After the related literatures review, the conceptual framework is defined as follows.

Fig. 1 Conceptual framework for the study

III. METHODOLOGICAL DESIGN

The participants in this study came from two sections of students (n = 70) who were enrolled in BUS-109 course entitled Principles of Management, offered at Thai-Nichi Institute of Technology during the first semester in 2015. Overall participants were pursuing undergraduate level education programs in content areas of Japanese Human Resources Management major. Thirty-five participants in the first section were in the experimental group and another thirty-five participants in the second section were in the control group. Two periods of time, totally 6 hours, are spent for this study. Pre-test was used to test for both experimental and control group to study their previous knowledge before study. As for the experimental group in the first period of learning (3 hours), teacher will divide larger class room (n = 35) into smaller 7 groups (called the home group). Each group will contain 5 members randomize by using lottery method and later selecting the group head. Then, teacher will assign overall assignment and source of information to the group to focus on. Each group head will again assign each subtopic of the overall assignment to each member in their home group. In this study, there are 5 subtopics, which are (1) The Customer Perspective, (2) The Business Process Perspective, (3) The Financial Perspective, (4) The Learning & Growth Perspective and (5) Vision & Strategy in the strategic planning and management assignment. Fig. 2 shows the assigned subtopic to each member in the home group no. 1 (called experts). Next, new subgroups are formed which comprising of an expert from each home group that studies the same subtopic. Fig. 3 shows the Financial Perspective experts, apart from each home groups. The experts in each subtopic will discuss in what they learn from various sources of information or research about what they have responsible for their subtopic. In this stage, they discuss, share, and comment each other and summarize in what they learn in their expert group as cooperative learning. In the second period of learning (2.30 hours), each expert from each expert subgroup will go back to their home group and share, teach or explain what they have learnt for each subtopic. Fig. 4 shows how the assigned experts share or explain what they have learnt from the expert subgroup. Then, post-test are used to test for learner's learning achievement at the last 30 minutes of the study. At the end of the study, teacher will accumulate the individual point for each home group. Therefore, the home group that has the highest point will get the reward for incentive.
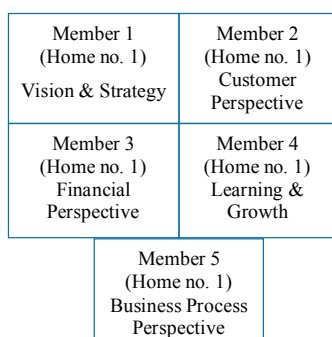
Member 1 (Home no. 1) Vision & Strategy	Member 2 (Home no. 1) Customer Perspective
Member 3 (Home no. 1) Financial Perspective	Member 4 (Home no. 1) Learning & Growth
Member 5 (Home no. 1) Business Process Perspective	

Fig. 2 Example of the group head that assigns subtopic to each member (expert) in the home group.

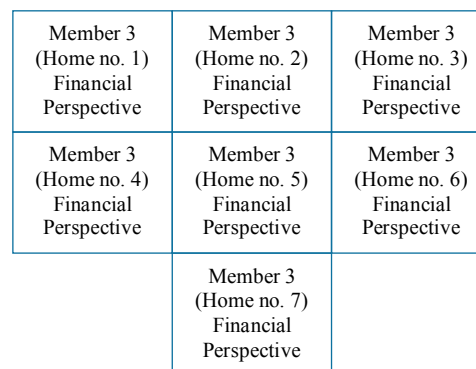| Member 3 (Home no. 1) Financial Perspective	Member 3 (Home no. 2) Financial Perspective	Member 3 (Home no. 3) Financial Perspective
Member 3 (Home no. 4) Financial Perspective	Member 3 (Home no. 5) Financial Perspective	Member 3 (Home no. 6) Financial Perspective
	Member 3 (Home no. 7) Financial Perspective	

Fig. 3 Example of Financial perspective experts apart from their home groups to create an expert subgroup.
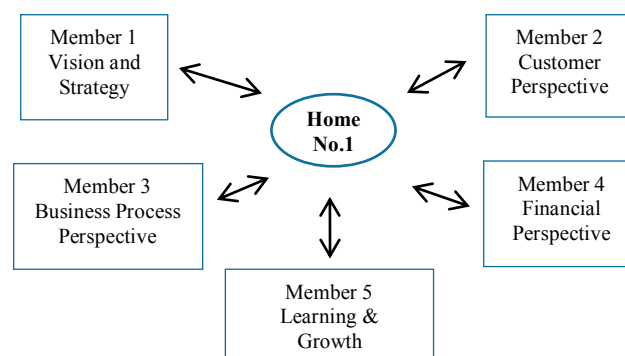

Fig. 4 Example of assigned experts share or explain what they have learnt from the expert subgroup

As for the control group, teacher will direct their students to the learning objectives of the subject in two periods of time, totally 6 hours. Teacher will provide the content while learners follow to the given lesson plan. Teacher is the center of learning while students are the followers. Finally, the post-test are used to test for learner's learning achievement at the last 30 minutes of the study.

IV. ANALYSIS AND DISCUSSION

In this section, the results acquired as a result of the research have been analysed in the directions of the aim of the study. Table 1 presents the independent groups t-test results of pre-test mean scores of experimental and control groups.

As seen in table I, there is no statistically significant difference was found in pre-test ($t = .308$, $p > .05$). The t-test results for average pre-test scores in table 1 showed similar features in terms of their average pre-test scores before experiment. This shows that there are no different in achievement both in experimental group and control group before experiment. Explicitly, there is no different in knowledge or learning background for both experimental group and control group in both section before the treatment. The average pre-test score ($\bar{x}$) of the traditional teaching method group is better but there is no significance to the average pre-test score ($\bar{x}$) of the Jigsaw technique teaching method group ($\bar{x}_T = 4.37$, $\sigma_T = 1.85$; $\bar{x}_J = 4.26$, $\sigma_J = 1.22$).

TABLE I

T -TEST RESULTS FOR PRE-TEST AND SCORES TOWARDS
LEARNING BEFORE EXPERIMENT.

	$\bar{x}$	σ	t	p
Traditional teaching (T)	4.37	1.85	.308	.760
Jigsaw technique teaching (J)	4.26	1.22		

(n = 35 for each experimental group and control group)

After the experiment, there is a statistically significant difference at the level of .05, which was found in post-test of the experimental group, which used jigsaw technique teaching method (t = 17.060, p < .05). As shown in Table II, indicated that the learner's achievement is increased. Average mean score in post-test is higher. They all achieve higher over the 60%-standard score pass, compared with the pre-test average mean score, which there were only 20% pass the test as shown in Table III. Therefore, the cooperative learning method by using jigsaw technique is a proper way to promote learners' participation and enthusiasm as well as a useful technique to focus on the cooperation to accomplish learning tasks. [11] It revealed the effectiveness of the classroom environment that utilized a cooperative-learning model and showed that the students in the experimental group performed better and supported them with the most benefit. [8] In addition to the post-test, using jigsaw technique will enhance students to pass over 60%-standard score pass to the score pass at 70%. Meanwhile, there are 25.71% of students do not pass the exam or standard score when using traditional teaching method, compared with students in the experimental group who all pass 100%. In the interview, students said jigsaw technique can encourage their cooperation, enthusiasm and motivation during they work in the group's activities. They could share their ideas, information, while debating the situations. They are enjoyable, react to the group and present what they learn from their subgroup or expert group.

TABLE II

T -TEST RESULTS FOR PRE-TEST AND POST-TEST SCORES
TOWARDS COOPERATIVE LEARNING METHOD BY USING
JIGSAW TECHNIQUE.

	$\bar{x}$	σ	t	p
Pre-test	4.26	1.22	17.060	.000*
Post-test	8.63	0.88		

(n = 35) (* < .05)

TABLE III

THE NUMBER OF THE STUDENTS WHO PASS EACH
STANDARD FROM THE PRE-TEST AND POST-TEST SCORES
PASS TOWARDS EACH LEARNING METHOD.

Criteria	Traditional teaching method		Jigsaw technique teaching method	
Standard score pass	Pre-test (person)	Post-test (person)	Pre-test (person)	Post-test (person)
100%	-	1	-	5
90%	-	3	-	16
80%	2	5	-	10
70%	3	11	1	4
60%*	7	6	6	-
50%	3	9	6	-
40%	4	-	11	-
30%	11	-	10	-
20%	5	-	1	-
Total	35	35	35	35

(* 60% standard for the score pass)

Table IV presents statistical results for pre-test and post-test scores. As comparison between pre-test and post-test score in control group, the mean score was changed from 43.7% to 67.1%. Meanwhile the mean score between pre-test and post-test in the experimental group was changed from 42.6% to 86.3%. As the result, teaching by using the jigsaw technique can increase learners' learning achievement, which the experimental group shows mean score higher than the control group. In addition to treatment, minimum score has changed from 20% to 70%, compared with the control group which has changed from 20% to 50%. There is someone who cannot reach the 60%-standard score pass. Meanwhile, students in the experimental group are all pass the 60% criteria after the treatment.

TABLE IV

STATISTICAL RESULTS FOR PRE AND POST-TEST SCORES
TOWARDS TRADITIONAL TEACHING AND COOPERATIVE
LEARNING METHOD BY USING JIGSAW TECHNIQUE.

Statistics	Traditional teaching		Jigsaw technique	
	Pre-test	Post-test	Pre-test	Post-test
Mean ($\bar{x}$)	43.70%	67.10%	42.60%	86.30%
Standard deviation (σ)	1.85	1.38	1.22	0.88
Minimum score	20%	50%	20%	70%
Maximum score	80%	100%	70%	100%

Table V presents the learner's learning achievement between groups showed a statistically significant difference at the level of .05, which was found between the post-test scores of the groups in the achievement test. A comparison of post-test scores of the groups indicated that learning method by using jigsaw technique enhanced and promoted students' performance in learning BUS-109 principles of management. The average score in the experimental group is higher than the control group ($\bar{x}_J$ = 8.63, σ_J = 0.88; $\bar{x}_T$ = 6.71, σ_T = 1.38). Therefore, teaching by using the jigsaw technique can improve students' learning outcome and their achievement. Students increases their attention, more individual and group responsibility, knowledge retention, intrinsic motivation, as well as more communication and participation in the classroom. They are proud of what they can show their knowledge in the content as the expert. They are enthusiasm in the class. [16] Meanwhile, traditional teaching method is the one-way communication from teacher direct to students. However, this method ignores the initiative and potential of the students. The teaching

process emphasizes system and completion but few thinking space for students. Students are passive in the class teaching and teachers cannot take care of every student in class who has different basis and interests. Students are listeners and put the teacher as the center. [9]

TABLE V
T -TEST RESULTS FOR POST-TEST SCORES TOWARDS TRADITIONAL TEACHING AND COOPERATIVE LEARNING METHOD BY USING JIGSAW TECHNIQUE.

	$\bar{x}$	σ	t	p
Traditional teaching (T)	6.71	1.38	7.638	.000*
Jigsaw technique teaching (J)	8.63	0.88		

(n = 35 for each experimental group and control group) (* < .05)

V. CONCLUSIONS

This research investigated the comparison of learner's learning achievement in principles of management subject between using traditional teaching method and cooperative learning method by using jigsaw technique. The findings suggest that jigsaw technique teaching method is the interdependent study, otherwise, individuals may not achieve overall learning objectives. Learning environment is arranged to face the real problems that need working in cooperation. Teachers are facilitators and provide resources or guide their students to achieve in each activities to reach overall objectives. Additionally, most students find that jigsaw technique teaching method enhance their self-confidence, cooperative learning, interactive learning and enthusiasm. As the result, this technique can improve in higher learning achievement. [3], [8], [10], [13] In conclusion, the cooperative learning method by using jigsaw technique have shown the better improvement than the traditional lecture teaching method because the jigsaw technique has encouraged students' cooperation and motivation. They could share their ideas, information, while debating the situations. Meanwhile, they can learn from the internet and available resources which draw more attentive than traditional lecture teaching method.

Social learning is a factor that support this method. They are enjoyable in their idea exchange, discussion or share information with peers. However, there are some limitations because jigsaw technique spends more time during study than traditional teaching method. Teachers as the facilitators have to spend more time in assignments and taking care of students. Teachers have to control the activities during the time frame. The different students' background have to be concerned, especially the intellectual level. This can take more time in elaboration during teaching. [13]

In addition, this study is mainly focused on social and behavioral sciences education. As for other science educations, additional activities may be required or adjusted to suit for the subject.

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