EFFECTS OF TEACHING ACTIVITIES USING TEAM LEARNING WITH DIFFERENT AND NON- DIFFERENT MAJOR SUBJECT GROUPS ON INNOVATIVE KNOWLEDGE CREATION OF UNDERGRADUATE STUDENTS

Noawanit Songkram

Faculty of Education, Chulalongkorn University.

noawanit_s@hotmail.com

Proceedings of APRU 9th Distance Learning and the Internet Conference 2008 (DLI)

Waseda University, Japan, 19-22 November 2008, Publication Date: 19 November 2008

Abstract

The purpose of this research was to study effects of teaching activities using team learning with different and non-different major subjects on innovative knowledge creation of undergraduate students. The subjects were 14 undergraduate students registered in Technology Activities course (2726311), faculty of Education, Chulalongkorn University. They were divided into four teams 1) Four team members with different major subjects 2) Three team members with different major subjects 3) Four team members with non- different major subjects 4) Three team members with non- different major subjects. All groups were taught by using team learning method. Instruments in this research consisted of the observational assessment, and innovation evaluation form. The data were analyzed by average, standard deviation, and t-test.

The results of the study revealed that:1. The evaluation showed that the scores of innovative knowledge creation in four groups; (1) Four team members with different major subjects were 94.66. (2) Three team members with different major subjects were 96.17 (3) Four team members with non- different major subjects were 98.83. (4) Three team members with non- different major subjects were 95.00 2. The results of factors for success team learning in interviewing team members consisted of five factors; 1) Leadership 2) Information Technology 3) Motivation 4) Sharing knowledge, experiences, and opinions 5) Trust

3. Team learning style of 14 undergraduate students after being taught by team learning method was higher than before being taught at .01 level of significance.

Keywords

Knowledge Creation, Team learning, Innovation.

Introduction

When there is revolution from "the age of information" to "the age of knowledge" and coming of knowledge-based society knowledge becomes one of important factors that promotes competitive advantage of several organizations. Both academic and economic sectors knowledge management process is increasingly seen as a key to organizational creativity and innovation. (Henard and McFadeyen, 2008) Nonaka and Takeuchi (1995) proposed that knowledge can be created through a process of dynamic interactions between explicit knowledge and tacit knowledge and also presented knowledge creation model which is the process of innovational creation. Senoo and Magnier (2007) also recommended that knowledge creation can enrich students' intellectual growth to perform their professional responsibilities by real practice and small group works. Working in Small groups support collaborative learning by sharing new ideas, experience, and discussion between intragroup and intergroup while instructors are able to facilitate students by giving advice, recommendations and setting learning environment. Many educators agree that when students work in small groups, they tend to understand the subject matter more thoroughly including small group work transforms the class into supportive learning teams. (CTE, 2008) Team learning, one of the best methods, supports working in small groups and enhances creation of knowledge because it is easier to arrive at correct answers and new ideas as a team rather than as individuals. (Feingold, 2006) It is well-defined instructional strategy development over 20 years and well-knowned organizational strategy development by Peter Senge. Team learning brings together theoretically based and empirically grounded strategies for ensuring the effectiveness of small group works independently. Assignments for group activities are designed to promote collaboration and sharing ideas or answers among students within a team. Thus, team learning

will have more powerful learning than individual learning and the discipline of team learning involves mastering the practices of dialogue and discussion to exchange the concepts, beliefs, and experiences of each individual member (Senge, 1990)

From reviewing the literature, the researcher found that innovative knowledge creation should be mentioned in term of education and should be implemented with undergraduate students to create educational innovation. Therefore, not only was the researcher interested to use team learning method for creating innovation but undergraduate students also enhanced themselves to be effective teachers. The results of this study will provide guidelines for further researches and be used to create innovative knowledge creation in other fields.

The objective of this study:

The purpose of this research was to study effects of teaching activities using team learning with different and non- different major subject groups on innovative knowledge creation of undergraduate students in field of education.

Hypothesis:

1. Team learning groups with different major subjects using team learning method had higher scores than team learning groups with non-different major subjects.
2. Students' team learning performance were higher than before at the level of significance .01

Methodology:

The researcher studied analyzed and synthesized information and research about knowledge creation, team learning and innovation for undergraduate students. Five experts in knowledge creation and team learning area monitor about process of team learning activities .Team learning activities were improved and tried out with subjects about 14 weeks after that data were collected, analyzed to make conclusion and discussion.

Subjects:

The subjects were 14 undergraduate students registered in Technology Activities course (2726311), faculty of Education, Chulalongkorn University. They were divided into four teams of three to four members each.

Instruments:

Instruments in this research consisted of the observational assessment, and innovation evaluation form. Content Validity of these instruments was also obtained from three judges considered to be experts in the field. These instruments were revised with the suggestions of the experts. For team learning style test it was developed from Tragoolsrid, W. (2002)

Experimental Stages:

1. The subjects completed the pretest of team learning style test prior to start the teaching activities using team learning**.**
2. The subjects performed activities from team learning method for 14 weeks as follow:

2.1 The subjects were divided into four teams; 1) Four team members with different major subjects 2) Three team members with different major subjects 3) Four team members with non-different major subjects 4) Three team members with non- different major subjects.

2.2 Each team set up roles, responsibilities and commitments include selecting one facilitator.

2.3 The instructor was identified tasks about team learning activities by integrating technology activities into contents.

2.4 Team members shared and brainstormed about ideas, opinions, and experience for proposing innovative teaching that integrated technology activities.

2.5 Team members searched data and information to discuss innovative teaching.

2.6 Each team reported innovative teaching progress.

2.7 Each team built a prototype which consisted of the lessen plan and materials that were innovation.

2.8 Each team improved and presented innovative processes and materials to other teams to share knowledge.

3. All four teams tried out innovative processes and materials with students.
4. The subjects completed the post-test of team learning style test.
5. Two assistants observed the participation of the subjects during the experiment in each step of team learning activities.
6. Each team, two experts and an instructor evaluated innovative processes and materials of all teams.
7. The researcher interviewed team members in all groups for finding the results of factors for success team learning.

Data Analysis:

Team learning was analyzed by using a dependent t-test. The observation of the participants was analyzed by using average and standard deviations,

and innovative knowledge creation scores was considered from self-evaluation (25%), peers evaluation (25%) and the instructor and two experts' evaluation (50%)

Table 1: Means, standard deviations and t-test result of the difference between the pretest and post-test team learning scores.

Team learning	Mean	S.D	Sig.
Pretest	3.99	0.65	.000
Post-test	4.61	0.23	

* Significant at the .01 level

After using the process of team learning activities, team learning style was analyzed by using a dependent t-test and found that there was a significant difference between pretest and post-test scores in team learning at the .01 level (See Table 1).

The result of innovative processes and materials of each team that finished in the end of process of team learning showed in Table 2 as follow:

Table 2: The scores of innovative knowledge creation

Team	1	2	3	4
Total (99 scores)	94.66	96.17	98.83	95.00
	Very good	Very good	Very good	Very good

The scores of each innovative processes and materials of team 1 to 4 were 94.66, 96.17, 98.83 and 95.00 in respectively. Every team was very good in innovative knowledge creation with high scores. The difference of scores between different major subject groups and non- different major subjects groups was only 1.5 scores.

The results of factors for success team learning in interviewing team members consisted of five factors; 1) Leadership 2) Information Technology 3) Motivation 4) Sharing knowledge, experience, and opinions and 5) Trust.

Discussion

Based on the results of the data analysis, there was a significant difference between learners' average post-test and pretest scores in team learning. It indicated that team learning method was effective in increasing the level of learning and working together as a team in order to create new knowledge. It improved the characteristic of team learning. This finding is consistent with Vanicharoenchai, V. (2005) and Tragoolsrid, W. (2002) team learning occurs by the members working together, helping each other, learning together, sharing knowledge, experience, and participating in collaborative learning.

That mentioned above about five success factors of team learning for innovative knowledge creation can discuss as follow:

1. Leadership

Leadership in team members is an important success factor for innovative knowledge creation. Learners must collaborate with each other in planning and decision making. The interviewing all team members is showed that they have capacity to communication, responsibility, good interpersonal relationship, stable emotional quotient and enthusiasm. As Songkram,N. (2008) and Promsri, C. (2007), Vanicharoenchai, V. (2003) stated that characteristics of team learners should consist of ability for communication, hospitality, flexibility, and capacity in team working.

2. Information Technology

In all groups, there were searching for data and information by using information technology such as website and printed materials for supporting innovative knowledge creation. This finding is consistent with Hijazi and Kelly (2003), Choi (2000), and Ruggles and Holthouse (1999) that information technology can be facilitate learners to create new ideas, new knowledge and innovation.

3. Motivation

Motivation of team members can be divided into two aspects; (3.1) one's personal Interesting and teaching activities (3.2) Grades and scores. Motivation supports sharing knowledge among learners. This research found that motivation is an important factor for success of sharing knowledge. Pukapan, P (2001) agreed that intrinsic motivation that comes from inside an individual supported team member to reach of the goals. Carol (2008) stated that the motivation comes from the sense of satisfaction in completing or even working on a task including extrinsic motivation such as money or grades. An intrinsically motivated person works on a solution to a problem because the challenge of finding a solution is provided a sense of pleasure.

4. Sharing knowledge, experience, and opinions.

The most important factor that creates innovative knowledge creation is sharing knowledge, experience, and opinions of team members. When members participate and brainstorm in intragroup knowledge is created, justified and provided the results in new knowledge. Nonaka, Toyama and Konno (2000) and Garlach (1994) also supported that the new knowledge or innovation is generated by coming and going

between tacit and explicit knowledge when they are shared, discussed, and brainstormed among members.

5. Trust

After interviewing with team members in each team the result of this research appealed that trust among team members is affected on sharing ideas, experience and opinions for increasing effective working. Team members are willing to share with each other and transfer their knowledge. They open a dialogue on the facts, creating a friendly environment of openness, acceptance, respect for the ideas of team members, and providing a sense of safety in facing risks. As Hanpanich, B. (2003) believed that trust is affected on team's collaboration and sharing knowledge. In addition to Welch, J. (2004) also stated that interpersonal trust promotes creativity, conflict management, empowerment, teamwork, and leadership during times of uncertainty and change. The finding of this research pointed out that teams with less conflict can establish creativity and leadership into individuals effortlessly.

Recommendations

In order to implement this research, it is recommended to be performed as follow:

1. For team learning method learners should have opportunities to apply all their major subjects in creating innovative knowledge creation.

2. Time for team learning activities should be more flexible for creating effective innovative knowledge creation.

3. Examples of innovative knowledge creation should be mentioned with learners before starting team learning activities.

4. The further research should study about development of an innovative knowledge creation model using team learning in blended learning for undergraduate students.

Reference

Aps, J. (1996) SMALL GROUP WORK *CTE- TA Handbook*. Available online: www.udel.edu/cte/TAbook/groups.html

Bainbridge, Carol (2008) *Intrinsic Motivation* Available online: http://giftedkids.about.com/mbiopage.htm

Cottell,Jr.,P.G. and Millis, B.J.(1993) Cooperative learning structures in the instruction of accounting. *Issues in Accounting Education* 8, 40-58

Feingold, Carol E and et al. (2006) Student Perceptions of Team Learning in Nursing Education. *Journal of nursing Education*. May, 47:5, 214-222

Fox, J and Klein, C. (1996). *The 360-degree Evaluation Public Management*. 78 (Nov)

Hanpanich, Boonsong (2003) *A Development of the knowledge management models in Thai higher institutions*. Higher Education Department, Field of study in Higher Education, Faculty of Education, Chulalongkorn University.

Henard, David H and McFadeyen (2008) Working knowledge workers more creative *Research – Technology Management* March-April, p.40-46.

Hunt, Daniel P and et al. (2003) The Effect of using Team Learning in an Evidence-Based Medicine Course for Medical Students *Teaching and Learning Medicine,*15:2, 131-139

Kreie, and et.al (2007) Using team learning to improve student retention. *College teaching,* 55:2, 51-56, Washington.

Lancaster, Kathryn A.S. and Strand, Carolyn A. (2001) Using the team-Learning Model in a Managerial Accounting Class: An Experiment in Cooperative Learning. *Accounting Education* 16:4**,** 549-567 ABI/INFORM Global.

MaCain, Barbara (1996) Multicultural team learning: an approach towards communication competency *Management Decision* 34:6, 65-68

Michaelsen L (1998) *A workshop on using small groups effectively.* AAA Annual Meeting, New Orleans, LA, Continuing Professional Education.

Nonaka, I. and Takeuchi, H. (1995). *The Knowledge-Creating Company: How JapaneseCompanies Create the Dynamics of Innovation*. New York: Oxford University Press:

Promsri, C (2006) *Organizational leadership,* Expernet: Bangkok

Pukapan, P (2001) *Leadership and Motivation***.** Jamjuree Print: Bangkok..

Rassuli, Ali and Manzer, John P (2005) "Teach us to learn": Multivariate Analysis of Perception of Success in Team Learning. *Journal of Education for Business.* Sep/Oct 81:1, 21-27. ABI/INFORM Global

Senge, P (1990) *The Fifth Discipline: The art and practice of the learning organization*. Doubleday, New York.

Senoo, Dai and Watanabe, Remy Magnier (2007) Workplace reformation, active ba and knowledge creation from a conceptual to a practical framework. European *Journal of Innovation Management* 10:3, 296-315

Songkram, Noawanit (2007) *The development of a knowledge creation model using action learning and collaborative learning for staff members in higher education institutions: A case study of faculty of Education, Chulalongkorn University.* Curriculum, Instruction, and Educational Technology Department, Field of study in Educational Communications and Technology, Faculty of Education, Chulalongkorn University.

Tragoolsrid, Waraporn (2002) *A proposed model of web-based instruction with project-based learning for team learning of student at King Mongkut's university of Technology Thonburi*. Audio-Visual Education, Faculty of education , Chulalongkorn University.

Vanicharoechai, Vorawan (2005) *Development of knowledge creation systems using team learning methods for nursing instructors in higher education institutions.* Curriculum, Instruction, and Educational Technology Department, Field of study in Educational Communications and Technology, Faculty of Education, Chulalongkorn University.

Welch, J (2004). Building and Repairing Trust. *Leaderletter.* Sept,30. Available online: http://www.wright.edu/~scott.williams/LeaderLetter/trust.htm

Yazici, Hulya Julie (2005) A study of collaborative learning style and team learning performance .*Education & Training* 47:2/3, 216-229.