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The effect of a flipped classroom with online group investigation on students' team learning ability

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ABSTRACT

This study examined the effects on the team learning ability of upper secondary school students using a flipped classroom model with online group investigation. The subjects of the study were 30 upper secondary school students. The instruments employed in the study consisted of: (1) a flipped classroom model with online group investigation, (2) a website for flipped classrooms, and (3) a learning management plan. The data collection instruments comprised: (1) a self-assessment form of team learning ability and (2) a team learning behaviour observation form. The study found that the average team learning ability of the learners was significantly higher after the lessons, and those with different learning abilities were able to learn as a team at significantly different rates. Post-hoc multiple comparison tests (LSD) revealed that the team learning ability scores of the learners with high learning ability differed significantly from those of the intermediate and beginner learning ability groups, while the team learning ability scores of the intermediate and the beginner groups were not significantly different. The beginner group scored the highest regarding team learning ability, followed by the intermediate group and the advanced group, respectively.

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Introduction

The current instructional trend sets out to foster collaborative skills or team learning as one the 21st century learning skills. However, every milieu of our society now appears to be beset by conflicts, disunity, and divisiveness, which points to a general lack of understanding of how to co-exist in a society with individuals or groups of individuals who have different ideas and behaviour. Conflicts between individuals or groups of individuals are also

common, even in educational institutions, with brawls between students regularly reported in the news. This results from a lack of understanding and the skills for cooperation and collaboration (Lawford, 2003; Mu & Gnyawali, 2003). Therefore, it is necessary for teachers to foster collaborative and team learning skills in students.

In the 21st century, various learning models have been developed to keep up with changes in social context and the advancement of science and technology. A flipped classroom is one such learning strategy that creates learning through technology. In addition to the flipped classroom strategy, learning approaches also form an integral part in developing team learning skills. A commonly employed learning approach is Group Investigation (GI), a collaborative learning model that encourages learners to work and communicate with each other through group

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processes for mutual benefits and for team achievement (Johnson, Johnson, & Smith, 2007). The GI model lends itself to fostering team learning in both regular and online classrooms. Therefore, the group investigation was integrated into the learning management of an online classroom and employed online collaborative learning tools.

As a flipped classroom with online group investigation could promote the team learning ability of upper secondary school students as demonstrated above, it was interesting to examine the effects of a flipped classroom with online group investigation in the enhancement of the team learning ability of upper secondary school students, which could be beneficial for future application of the model to other areas to develop students' team learning ability. Accordingly, the aim of the study was to examine the effects on team learning ability in upper secondary school students using a flipped classroom model with online group investigation. Below are the guiding research questions.

1. Does the use of a flipped classroom model with online group investigation promote team learning ability?
2. Do learners in the three proficiency groups (advanced, intermediate, and beginner) have different team learning abilities?

Literature Review

Flipped Classroom

A flipped classroom is an instructional strategy and a type of blended learning that reverses the traditional learning environment by delivering instructional content, often online, outside of the classroom. It is one such learning strategy that creates learning through technology, especially online video media, which helps reduce lecture time and increase the time for in-class activities where learners can learn cooperatively through practice (DeLozier & Rhodes, 2017; Jovanović, Gašević, Dawson, Pardo, & Mirriahi, 2017). Technology can support flipped classrooms by letting students gain first by exposure to new material outside of class, usually via reading or lecture videos and then using class time to do the harder work of assimilating that knowledge, perhaps through problem-solving, discussion, or debates. The growing accessibility and sophistication of educational technologies opens up increasing possibilities for students to explore, share, and create content (Bergmann & Sams, 2012). In addition, a flipped classroom has also been shown to promote not only students' sense of responsibility for their own work and self-regulation in assignment submission, but also their responsibility toward group assignments and classroom activities (Panich, 2013; Yilmaz, 2017).

Online Group Investigation (GI)

Group investigation (GI) is a collaborative learning model that encourages learners to work and communicate with each other through group processes for mutual benefits and team achievements (Johnson et al., 2007). Because

it divides students into advanced, intermediate, and beginner groups, the GI model lends itself to fostering team learning in both regular and online classrooms (Khammani, 2007). The integration of group investigation learning into the learning management of an online classroom involves employing online collaborative learning tools designed to support group tasks, especially in terms of both synchronous and asynchronous communication, such as chat features, web boards, and brainstorming (Chou & Chen, 2008; Chrayah, El Kadiri, Sbihi, & Aknin, 2012). Because these tools also enable systematic collaborative information searching and management and allow learning to transcend time and place limitations, they lend themselves to the management of a flipped classroom and help promote team learning ability (Hall & Zarro, 2012).

Team Learning

Team learning focuses on the abilities of a group working together. It involves collaborative effort to achieve a common goal within the group and refers to the process by which students learn continuously and cooperatively with group members, with emphasis on teamwork in each step of the process, from learning and assisting each other to working together. The learning takes place through the transfer of skills by observing others in action, collective problem-solving and experimentation, questioning assumptions, and reviewing outcomes as a group. During this process, every member must keep in mind the notions of collaboration, work delegation, and mutual responsibilities toward problem solving, emphasizing the association between team success and the social skills of the individuals in teams (Riebe, Roepen, Santarelli, & Marchioro, 2010; Freeman, 2012).

Methods

The flipped classroom with online group investigation used a quasi-experimental one-group, pretest-posttest design.

Participants

The subjects of the study consisted of a class of 30 upper secondary school students at Singburi School in their second academic year in 2015. The school is located in the Singburi province, central region, 142 km from Bangkok, the capital of Thailand and has a population of 212,518. They were purposively sampled because the number of students was considered sufficient for the experiment and the school was also technologically equipped both in terms of support equipment and the Internet.

Materials and Tools

The instruments employed in the experiment were:

1. A flipped classroom model with online group investigation for the enhancement of team learning ability of upper secondary school students was developed, based on ideas,

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