

# Beyond The Lecture: The Use of Collaborative Online Learning in

# **Principles of Economics**

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**Abstract:** The purpose of this study is to investigate the use of collaborative online learning (COL) to foster students' interest in the course of Principles of Economics and online learning. The participants were 56 students from a university selected randomly and divided into two groups (experimental group and control group). A set of questionnaire and the quasi-experimental method were used in the study. Only one hypothesis had been tested. MANCOVA and ANOVA were employed for testing the significant effect in the mean score of students' interest in the subject and collaborative online learning. The results show that the students in the experimental group significantly outperformed in these two matters.

**Key words:** collaborative online learning; interest; quasi experiment; principles of economics **JEL code:** A2

# **1. Introduction**

The rapid advancement of technology and internet connectivity, coupled with the increasing support in using online communication as learning tools have fostered educators to develop a web-based learning environment. The online learning is always classified with the perception "learn anytime and anywhere". However, online learning is more effective when learners learn in group discussion or collaboration (Finkelstein, 2006). Most of the students have used their time for social activities rather than academic activities. The amount of time that students spent on online discussion was only 0.18 hour per week compared to 13 hours per week for non-academic activity (Kurz, Perry & Smith, 2003). In the early stage of this study, some undergraduates did not realize that discussion could be done online and they thought that the use of internet is only for emailing and chatting. Therefore, a proper pedagogical approach that could lead students to understand better should be implemented.

Collaborative Online Learning (COL) has been selected for this study because it has been proven effective in helping students to develop deep learning in various courses, such as Science, Mathematics and Geography. These courses have been used widely in distance learning activity (Klein, 2008; Lunsford, 2008; Hargis & Wilcox, 2008; Koo, Ahmad Rafi, Khairul Anuar & Balachander Krishnan, 2009). COL is a form of virtual learning and instructional environment, which facilitates participants' cognitive, constructive and communicative learning,

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needs (Yoon & Lim, 2008; Coughlin & Kajden, 2009). COL is also implemented widely in some universities as an innovative way of teaching higher thinking order skills to explore the students' reasoning ability and moving away from the traditional rote learning method (Jonassen, Peck & Wilson, 1998, Khoo, 2012). COL is a tool to allow two-way online communication between lecturers and students and among students themselves (Sidek, Yunus, Bakar and Meseran, 2006). Prior reviews by Shieh (2010), Choi and Kang (2010), Jhang, Nielsen and Chan (2010) also showed the significant study on students' performance and computer-supported collaborative learning. Besides, the Social Constructivist Theory (Vygotsky, 1997) emphasizes that interaction between peers promotes deep learning by exposing students to different media for negotiating (Brett & Nagra, 2005). Technology-supported learning environment such as COL has been created to mediate interaction. However, the use of collaborative online learning in Principles of Economics to foster students' interest has yet to be proven. Thus, this paper is to fill the research gap in the subject area.

# 2. Purpose of the Study

The purpose of this study is to examine whether the COL method is effective in fostering students' interest in the course of Principles of Economics and collaborative online learning.

# 3. Hypothesis

In this study, students were divided into two; an experimental group—Collaborative Online Learning (COL) that used online discussion after lecture and a control group (CG) that was taught in conventional collaborative way. The formation of the two groups is to make comparison of the effectiveness of fostering students' interest in the course of Principles of Economics and collaborative online learning. The hypothesis leading to the research is that, the COL students would make significantly greater gain than the CG students would. These expectations lead to the following hypothesis:

COL students would have significantly higher mean scores than the CG students' mean scores in the effort of fostering their interest in the course of Principles of Economics and collaborative online learning.

#### 4. Conceptual Framework

The conceptual framework of this study is based on Vygotsky Theory (Vygotsky, 1997) and Cognitive Online Learning Theory (Kalat, 2007). Based on these two theories, a conceptual model of the present study is built as presented in Figure 1.

For this model, the student and lecturer interact with each other with the assistance of online learning. Students can interact directly through this type of collaborative online learning. The interaction can take place anywhere with the date and time that appointed by the lecture through online learning. These online environments are particularly allowing learner to share their views and enhance their interest and their personal attitude towards learning. It also helps learner to build up their relationship among peers.

This model also emphasized students can engage in independent study (attitude), but they are not alone. The students can get assistance from peers or lecturer when they need them. According the theory of Zone of Proximal Development (ZPD), students are able to solve the more difficult and complex task with the assistance from the capable peers through interaction. The Cognitive Online Learning Theory state that strategies such as

collaborative allow learners to perceive the information that can transfer to the working memory. The lecture can highlight the difficult task to focus the students attention while carry out the discussion. In order to achieve the ZPD, the lecturer should organize the online discussion according to the difficulty level of questions that match to the cognitive level of the majority learners. The simpler and the complicated questions can be link to accommodate students at different knowledge levels (Ally, 2008).



Figure 1 A Model of Online Learning

#### 5. Literature Review

# **5.1 Theoretical Perspectives of Collaborative Learning**

There is a theoretical perspectives found relevant in this study that underlies work in collaborative learning. Theory of Vygotsky (1997) that place important on social interaction as a force in mental development. The zone of development theory (ZPD) holds the viewpoint that the knowledge is a social construct and the learning awakens a variety of development processes that are able to obtain when students are interacting with peers (Vygotsky, 1997). Thus, all cognitive processes are initially social, shared between lectures and students. According to Vygotsky (1997), a less skilful individual is able to develop a more complex level of understanding through collaboration with the help of a capable peer.

#### 5.2 Effects of Collaborative Method

Collaborative method is considered effective to build positive attitude of students. For example, students' interest can be upgraded. Besides, they will have positive attitude towards collaborative method. It is proven by Insung, Seong, Lim and Jung (2002). Students can be exposed to high-level thinking process and can get good performance results (Nuthall, 1997).

Using students-centres collaborative method, they are guided by their same age friends, facilitators to understand and build new knowledge. Students can share opinions among them and find solutions for existing problems (Li, 2007). After discussion, students report findings in class to help them in having more understandings. Li (2007) said that collaborative method also helps to give deep understanding after they solve problems. Using this approach, students will study on how to find out information effectively and elaborate their cognitive learning (Astleitner, 2002). The findings of Mergendoller, Lahart and Mass (2002) show contradict result because their studies do not have any effects between collaborative method and students' interest. According to Lischner (2007), active learning such as collaborative method can raise students' interest. COL implementation

will prove the validity of this theory.

Collaborative method has more focus on solution process than finding answers. When the students search for solution, they need to use their existing knowledge to interact between them. According to Pithers (2000), this method can develop students' critical thinking as well as encourage their life-long learning.

#### **5.3** Collaborative Method through Online

Collaborative method through online is a learning method based on constructivist. Studies have proven that learning through online is more effective compared to traditional method (Sajap, 2002). One of challenges that must be faced is the merger of technology and PBL. Nevertheless, pedagogy shall be given priority and support by technology. This situation will produce techno pedagogy (Uden & Beaumont, 2006).

This collaborative method through online may be different from long-distance learning because the latter needs much cost. It may be done by institutions. Lecturers can use available facilities such as yahoo messenger to implement this collaborative method. The implementation success of this method depends on students' involvement activity.

According to Baharuddin and Ellington (2001), learning through web can achieve success only if it has these features:

- Obtaining learning context which involves actual solutions for existing problems.
- Students are responsible and have initiatives to study by themselves in developing a skill.
- Lecturers or teachers act as facilitators and supply information.
- Active discussions exist between facilitators and students.
- Collaborative learning method assists students to develop self-learning.
- Assessment of learning strategy in assessing actual skills.

#### 5.4 Advantages of Collaborative Method through Online

From the perspective of education, web is suitable as an instrument used for teaching and learning with features of assisting students to explore and make ways for individual learning from given materials (Donelly, 2004). The author states that technology-assistance can develop students' thinking.

Ronteltap, Koehorst and Imbos (2007) gave their opinion on advantages of collaborative method through web such as:

(1) Assistance from friends by way of collaborative—students can build knowledge from cognitive aspect and review what have been discussed,

(2) Technology–assistance—it encourages students to use inquiry method while they seek materials and reflect their thoughts, encourages knowledge-building and creates keeping of records.

If we review one by one, the views of Ronteltap, Koehorst and Imbos (2007) can be concluded in the sense that students are able to exchange their thoughts. Their friends can criticize these ideas and do improvement after their discussion. Actually, ideas can be explained in forum in order to get opinions from the other group members too.

Penalvo (2008) views that learning through web has advantages as follow:

(1) Flexible—many students can find suitable places to carry out their learning activities

(2) Assessment—Facilitators are able to make assessment easily,

(3) Motivation—e-learning activity is easier to encourage learning and motivate teenagers, learning interest in the present decade and

(4) Strategy—Facilitators are able to create various learning activities for them.

However, there are studies that have opposite findings. Curtin (2002) used Kolb model (1984) to test online tutorial for the purpose of encouraging participants to discuss and interact with friends. The results failed because the questions supplied are very much difficult. All the module questions are displayed on web.

#### 5.5 Theory of Collaborative Method through Online

Learning through online is a type of visual learning that encourages student from cognitive and constructive aspects and fulfils the needs of communication in the present decade. Educators in solving problems can apply this method effectively (Hannafin, Land & Oliver, 1999).

Siemens (2005) states that the theory of collaborative method can help students learn by themselves with information obtain from internet. Students also can learn faster because internet can increase knowledge quickly. With correct usage, students must gain modern information quickly. They must identify which knowledge is more important. They are able to learn wherever they are.

Students can study about certain knowledge easily (Phelps, Hase & Ellis, 2005). In fact, the use of knowledge content shall be suitable with the level of students so that they can take part and interact between them. However, there are also many learning theories relevant to collaborative through online such as Behavior Theory, Information Management Theory and Constructivist Learning. Although focus of this study is on Constructivism Theory, the Behavior Theory and the Information management Theory are explained briefly.

#### **5.6 Behaviour Theory**

Skinner (1974) states that the earlier effects of individual learning influenced by environment. With existing collaborative method through web, students react with new excitement of behaviour learning. Besides, they can develop self-learning after participating in the collaborative method through web.

#### 5.7 Information Management Theory

This learning occurs when students carry out activity through web, receive information to process, and keep memory for learning purpose. However, this type of memory is called short-term memory. It can keep in less than 20 seconds except when it is repeated.

# 5.8 Constructivist Learning

Constructivist Learning Theory is a process that helps students to integrate with real world (Alessi & Trollips, 2001). Constructivist Learning builds knowledge that is based on update knowledge and experience of early times. From constructivist perspective, students learn through experience and generate new knowledge.

Collaborative learning is very important because of learning or how to interact with other people. Two kinds of collaborative are, student to student learn with his or her study partner and solves problem by testing and understanding the process of discussion results. Collaborative with tutors means they take part in the problem solutions. However, in teaching time, teacher should encourage group activities to run with condition that all students take part to solve problem.

From the view of constructivist, three components for interaction:

(1) From academic aspect (Student to computer): When students use computer to search material.

(2) Collaborative (Student to student): When students use web and connect with each other.

(3) Interpersonal: Social relationship exists when students receive feedback from facilitator.

#### 5.9 Model of Collaborative Method through Online

Baden and Wilkie (2006) is built a model in Figure 2. It represents activity that is carried out during the implementation of collaborative method through web, which involves students' activity, and they focus on

discussion activity on web. The equipment used is internet and facilitator will transform his or her knowledge through the equipment when giving feedback to students. The teaching method selected is student-centred. The subject in this model is students and they are requested to obey the rules provided by the facilitator during discussion. Facilitator must create a learning environment in which students are applied with equipments of computer and internet.



Source: Modify from Baden and Wilkie (2006), p. 68.

After discussion of works, student takes part in discussion with friends. Internet resources are always referred to monitor their discussion. Students gain knowledge through internet. Inquiry method and problem-solving process happen through discussion. By using collaborative through conventional, students meet with each other but sometimes they loss ideas because they do chitchat on difference topics.

# 6. Methodology

# 6.1 Design

A quasi-experimental pre-test post-test design was applied in the study. The selection of a quasi-experimental was appropriate because it allowed for comparing the effects before and after the intervention. A quantitative method was selected to measure the life experiences of the undergraduates before and after the intervention. The

experiment was divided into two groups (COL and CG). The COL group consisted of 29 students and the control group (CG) consisted of 27 students. COL was a group of students that learnt through collaborative online method whereas CG was a group of students that learnt through conventional collaborative method, such as tutorials. CG followed the same test pattern and instructions received by the experimental group except no COL method was used. It meant that the control group CG received a same content during lecture but the group members participated their discussion face to face. Therefore COL and CG groups indicated the differential effects of the experimental intervention.

### 6.2 Sample

The samples were 56 undergraduates' economics students from a public university in Malaysian. The sample of this study had selected randomly according to group basic. In order to eliminate extraneous variables among the groups, students who had chosen obtained a similar result in Mathematic and Economics during their pre-university assessment's result. A random technique had employed to assign students between experimental groups and control group. Group comparison remained the same throughout the study.

# 6.3 Group Size

This study used a group size of four or five. There were approximately 26 students in a group. As four or five students in each group, there were 4-5 groups in each experimental condition. Four in a group was considered ideal because the group was large enough to contain students who bought different views and experiences in online discussion.

### **6.4 Procedures**

The researcher obtained approval and permission from the Research Management Centre (RMC), Sultan Idris Education University and the participating university in Malaysia before conducting the pilot study. A pilot study was conducted to validate research procedures. The pilot study was randomly selected 30 students who were not going to participate in the actual study.

During the actual study, the students were randomly divided into two groups and studied the same subject. Each instructor taught a group of students. An instructor had assigned to the COL who participated in three training sessions that used COL method. The teachers were explicitly trained to use COL. The COL process was carried out by using Yahoo Messenger. The COL students also attended the training on how to use Yahoo Messenger to carry out online discussions. This device selected because it is free, simple and user friendly. All the lecturers were provided the same course outline in experimental and control groups.

Before implementing COL, the students were informed to complete a questionnaire. During COL implementation, the study developed 4 modules, which consisted of learning materials and questions for discussion. The COL students needed to discuss online every week. They had to send their reports weekly after discussion. The intervention took four weeks to implement.

After one month of implementing the COL method, the undergraduates of the Principles of Economics were again asked to complete a questionnaire.

#### 6.5 Threats Control during Intervention

(1) Recruiting of facilitators: All the lecturers who taught the Principles of Economics during semester 1, 2012 had been informed about the research. They had asked whether they were interested in volunteering to participate in this study.

(2) Recruiting of students participants: Students were selected in-group during the intervention in order to

interrupt their actual lecture. All the students were from the same course, similar age and similar economics result based on their pre-university result.

(3) Training of facilitator: Facilitators were trained prior to the start of data collection. All the facilitators were provided the instruction guide, check list and trained them to get use to it with yahoo messenger. Facilitator was given information that would assist them in guiding students during the online sessions.

(4) Training of students: Students were trained prior to the start of data collection. They were trained to use yahoo messenger and how to communicate online with their peers. A leader had been selected from each group to ensure all the information had been recorded and posted to university website. Besides the leaders had to make sure group members participate to the online activities by completing the checklist.

(5) Statistical control: In an experimental research, the researcher select the groups for the study, design the proper treatment attempts, in order to control the extraneous variables and observe the effects of the variables across the groups.

#### 6.6 Instrument

A set of structured questionnaire was used in this study, which consisted of 20 close-ended items. All the items were phrased positively based on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The selection of 5-point Likert scale is because of the availability of a "neutral" view from respondents, which is represented by the middle point.

Students' interest in the course of Principles of Economics and collaborative online learning in the questionnaire was identified as having two factors that were specially related to the items of collaborative learning. The set of questionnaire has two parts, students' interest in Principles of Economics and collaborative online learning. Each part consists of 10 items.

Content and face validity had been measured to ensure systematic assessment in this study. For this purpose, a draft of questionnaire was distributed to relevant experts in order to get feedback concerning the content, adequacy, suitability and layout of the items. The clarity of the instrument had also been examined and found valid by referring to the experts. The result of the overall Cronbach's Alpha reliability of coefficients based on questionnaire items is 0.850.

#### 7. Results

### 7.1 Testing of Hypothesis 1

COL students who were taught via COL would have significantly higher mean scores than CG students' mean scores in the hypothesis testing on students' interest in the course of Principles of Economics and collaborative online learning.

#### 7.2 The Questionnaire Outcomes on Students' Interest

Table 1 shows students' interest in the subject of Principle of Economics in which COL has an influence on students' interest through the items 1-10. These items show high mean scores that are above 3.5 after intervention. It means that COL has a significant role in fostering students' interest. On the other hand, CG students have decreases in their mean scores on items number 2, 4, 9 and 10. The overall mean score for COL was 3.867 and CG was 3.550 as shown Table 3. These results indicate that EG outperforms in comparison with CG.

No. Item	Pre-experiment		Post-experiment					
	COL	CG	COL	CG				
Confident of solving tutorial questions	3.242	3.558	4.226	3.600				
I like economics theory	3.286	3.580	3.563	3.535				
Interest in economics	3.216	3.445	4.022	3.681				
Enjoy learning economics	3.358	3.739	3.720	3.645				
Discuss economics topic	3.562	3.678	3.829	3.704				
Search material related to the topic	3.364	3.349	3.793	3.509				
Problem solving becomes very simple	3.086	3.214	3.790	3.328				
Present better task	3.444	3.230	3.698	3.525				
More time to spend on this course	3.550	3.450	3.815	3.433				
Confident of scoring better result	3.640	3.700	4.214	3.540				

Table 1 Mean Scores of Students' Interest in Principles of Economics

The mean scores after intervention of items 1-10 for experimental and control groups are shown in Figure 1. COL has a better result in the post-experiment in comparison with CG.



Figure 1 The Mean Scores of COL and CG after Intervention for Items 1-10

Table 2 reveals the results of the students' interest, which are based on the COL Questionnaire. The results indicate that the COL students were closely involved in collaborative learning and had worked well together as compared to CG students. In short, the results reveal that the COL students have fairly high mean scores in the items 11-20. It means that the students like to tie together and feel a sense of belonging in the COL group. However, the students in CG show a decrease in the mean score of the item number 15. It indicates that COL students have a good improvement in mean scores as compared to CG. The overall mean score for COL was 4.386 and 4.211 for CG as shown in Table 3. Figure 2 reveals a clearer picture for COL and CG after intervention for items 11-20. The result indicates that COL has a greater improvement in post-experiment in comparison with CG.

Table 3 shows that there are differences between the mean scores of students by group on students' interest. In order to verify that these differences are statistically significant, multivariate analysis of variance (MANOVA) was conducted.

N. L	Pre-experiment		Pos	Post-experiment	
No. Item	COL	CG	COL	CG	
My leader is fair in distributing work.	3.138	3.704	4.345	4.370	
I like to participate in this group.	3.276	3.815	4.379	4.148	
I encourage my friend to participate.	3.241	3.179	4.448	4.407	
I am willing to assist my peers.	3.241	3.179	4.241	3.967	
I always share my thought with others in online discussion.	3.241	4.148	4.483	4.000	
I can get immediate assistance from other group members.	3.207	4.037	4.276	4.148	
I work hard so that my group can score good results.	3.276	3.926	4.414	4.259	
I have been given chances to share my views.	3.172	3.926	4.448	4.259	
I always give responses to my group members.	3.138	4.000	4.448	4.185	
It is easy to solve problem through collaborative online learning.	3.276	3.630	4.379	4.370	

Table 2 Mean Scores of Students' Interest in COL Questionnaire



Figure 2 The Mean Scores of COL and CG after Intervention for Items 11–20

	Table 3E	ffect on COL and C	2G	
		COL	CG	F
Factor Interest in		(n = 29)	(n = 27)	
	]	Mean (SD)	Mean (SD)	
Principle of Economics	-	3.867 (0.252)	3.555 (0.212)	$6.459^{*}$
Collaborative online learning		4.386 (0.490)	4.211 (0.460)	$6.670^{*}$
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Note: \*significant at p < 0.05.

The Pillai's Trace was used to evaluate the multivariate (MANOVA) differences. The MANOVA results explain that there are statistically significant differences between two different teaching methods on the dependent variables (Pillai's Trace = 0.140, F = 3.818, p < 0.05). The value of Pillai's Trace, 0.140 means that the variance in the dependent variables is not accounted for by the independent variables. The ANOVA results also indicated that there are statistically significant differences in the dependent variables. The significant F = 6.459, (p < 0.05)indicates that the collaborative online learning (COL) has a main effect on students' interest in the course of Principles of Economics. On the other hand, the significant F = 6.670, (p < 0.05) reveals that the COL had a main effect on students' interest in this learning method. This significant difference reflects that COL differed from CG and the hypothesis should be rejected.

#### 8. Discussion

Hypothesis has been rejected. The results show that there are significantly positive effects on students' interest in the course of Principles of Economics and collaborative online learning. The COL's performance is better than the CG's performance. The results indicate that COL could foster students' interest. Lischner (2007) also agreed that the conventional collaborative method could promote students' interest. In this study, the collaborative online learning would be able to have the similar effect with conventional collaborative learning. In addition, our young generation always involves with online activities in their daily lives. Therefore, the collaborative online learning method would foster their interest rather than the conventional learning method. Students are sharing their views and thoughts online with peers and they can work independently to complete their task on time. This learning method provides a platform to students where they can discuss their thoughts "anytime and anywhere" they wish.

The present results suggest that the collaborative online learning has the potential of further development. Future research on this topic is warranted. Collaboration with other universities on the related topic can be carried out to have wider views on this learning method.

### 9. Conclusion

Lecturers attempt to emulate the traditional instructional methods in the online learning environment. The role of the lecturer is to lead learning activity and ensures all the students communicate directly with each other. This online activity always fosters an atmosphere of sharing and learning among students. It also can stimulate active learning, in turn helping students to develop better problem solving skills and enhance their interest in the course.

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