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The Effectiveness of Collaborative Online Learning among Undergraduates in Principle Economics Classes

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Abstract

The aim of the study was to investigate the effect of collaborative online learning using to foster academic performance of undergraduates. Besides, these studies also examine the effectiveness of group cohesion. A quasi-experimental method was applied in this study. 56 students had been selected randomly and they were divided into two groups (experimental group and one control group). Only one hypothesis had been tested. ANCOVA had been employed for testing the significant effect in mean score of performance post-test within groups. The results showed that the students in experimental group significantly outperformed in their academic performance mean score. The findings of this study revealed that the collaborative online learning in enhancing students' performance. The results also show that students in experimental group had higher mean score than the control group in group cohesion.

Keyword: Collaborative Online Learning, Economics, Performance, Quasi Experiment, Group Cohesiveness

Introduction

Undergraduates are growing up in a world dominated by computer and internet. Studying in university requires a lot of computer and internet usage. Online activities become part of modern life among undergraduates. Participation in those online activities such as: forums, games and emailing are really good especially for young generations. However, they seldom take the opportunity to discuss about their assignments. According to Kurz, Perry and Smith (2003), the amount of time that students spent on discussion online only 0.18 hour per week compared to 13 hours per week for non academic activity. It revealed that young generations like to spend time on their social activities than discussion online. With such a little time that the students spend on online-discussion, will we produce quality undergraduates? As well with technological revolution, the growing use of modern technologies has become necessary. Malaysia with the vision of enhancing an e-learning society has to upgrade the quality of undergraduates. Hence, most of the universities have developed a web-based learning environment for undergraduates. However, first year's undergraduates that just

entered the university would face problem to do collaborative online learning especially in the discipline like Principle Economics. Economics is one of the most difficult subjects for undergraduates to grasp the concept (Marby, 1998). Therefore, a proper pedagogical approach that could lead students to understand better should be implemented.

Collaborative Online Learning (COL) has been selected because it has proven effective in helping students to develop deep learning in various subjects such as, Science, Mathematics, Geography and has been used widely in distance learning (Klein, 2008; Lunsford, 2008; Hargis & Wilcox, 2008; Koo Ah Choo, Ahmad Rafi Mohammad, Kkhairul Anuar Samsudin & Balachander Krishnan Guru, 2009). COL is a form of virtual learning and instructional environmental which facilitates participants cognitive, constructive and communicative learning needs (Yoon & Lim, 2008; Coughlin & Kajden, 2009). COL is also implemented widely in some universities as an innovative way of teaching high thinking order to explore the students' reasoning ability and moving away from the traditional rote learning method (Jonassen, Peck & Wilson, 1998). COL is a tool to allow two way online communication between lecturers and undergraduates and among undergraduates themselves (Sidek et al., 2006). Prior reviews Shieh Ruey (2010); HyungShin Choi and Myunghee Kang (2010); NamsookJahng, Nielsen and Chan (2010) also showed the significance between students' performance and computer supported collaborative learning. Besides, Social Constructivist Theory (Vygotsky, 1997) emphasizes that interaction between peers promote 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 effectiveness of collaborative online learning in Principle Economics yet to be proven. Thus, this paper is to fill the research gap of this area.

In the present study, one experiment had been performed to examine whether the COL method was effective for improving the undergraduates' performance in Principle Economics. Besides, a further investigation about the effectiveness of group cohesiveness also had been carried out.

Regarding to the early section discussion, one experimental group (COL) and one control group (CG) that was taught in conventional collaborative would be formed to improve undergraduates' performance. The hypothesis leading to the research was, undergraduates that implemented with COL would make significantly greater gain than CG. This expectation leads to the following hypothesis:

Hypothesis 1:
Undergraduates taught via Collaborative Online Learning (COL) would perform significantly higher than undergraduates taught via Control Group (CG) in performance.

Methodology

Design

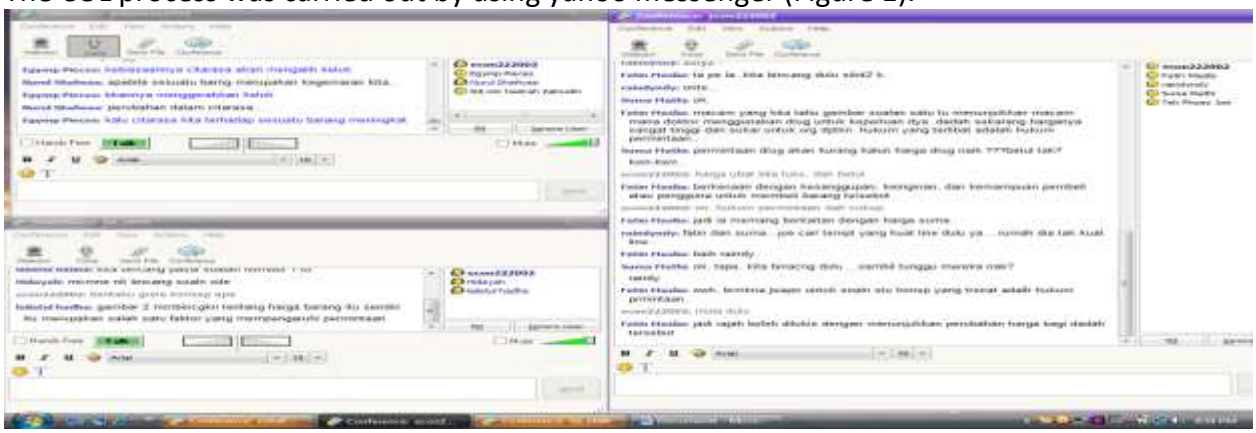
This study employed quasi experimental design with random of 56 Principle Economics undergraduates from one public university in Perak, Malaysia. A quantitative method to measure the live experience of the undergraduates at various stages. The experiment was divided into two groups (COL and CG). Experimental group (COL) consisted of 29 students whereas, control group (CG) consisted of 27 students. COL was a group of students that learnt

through COL method whereas CG was using conventional group learning during tutorial which functioned as a control group. However, CG followed the same pattern of testing and instructions as the experimental groups except no COL was taught.

Procedure

Before implementing the actual study sessions, a pilot study was conducted to validate research procedures. The researcher selected 30 participants randomly who were not going to participate in the actual study. Besides, pilot test was carried out to test for reliability and validity of the instrument.

The researcher selected two groups randomly from one course. Each instructor taught one class. The instructor assigned to the experimental group participated in three training sessions that focused on COL issues. The COL teachers were trained explicitly about the usage of COL. The COL process was carried out by using yahoo messenger (Figure 1).



Yahoo messenger was selected as a tool of online collaboration because students were comfortable with using it. Besides, it is free, user-friendly and unlimited number of users.

Before the implementing of COL, the undergraduates were informed to complete the questionnaire and pre-performance assessment. During the implementation of COL method, the researcher developed 4 modules that consist of learning materials and questions for discussion. Undergraduates need to discuss online every week. They had to send their report weekly after discussion. The intervention took 4 weeks to implement.

After one month of implementing the COL method, the undergraduates were asked to complete the performance test. After completing the performance test, they were asked to complete the questionnaire.

Instrument

There were two instruments used in this study. There was a set of Performance Assessment and a set of questionnaire. The Cronbach's Alpha reliability coefficients of Performance Assessment was obtained in .830. The instruments have been examined and found valid with referred to three expertise of Economics education. Besides, the Cronbach's Alpha overall internal validity of Performance Assessment was .875. Pre-Performance Assessment was given before the lecturers taught the topic. There was demand and supply in Principle Economics content. Performance assessment paper consisted of 30 objective questions was

similar to the university examination format. Post-test was given to the students after they completed learning topic of demand and supply with COL methods. The duration of the test was an hour. The questions of post Performance Assessment was exactly the same as pre-Performance Assessment questions but the sequences of the questions had been rearranged.

A set of questionnaires consisted of 10 items has found valid with reference to two lecturer in economics education. This questionnaires was adapted from Sopiah Abdullah (2005). The overall Cronbach's Alpha reliability coefficient of questionnaire was obtained in .850. This questionnaire used a five point Likert scale with 1 indicating strongly disagree and 5 showing strongly agree. Five point Likert scale was selected because respondents could have a "neutral" view that can represented by the middle point.

Results

The pre-experimental study was to test the assumption that the participants across two groups were equivalent in the conceptual understanding in the study. Table 1 indicated the descriptive statistics for the dependent variable (performance) by two groups. The COL and CG had similar mean on pretest (41.517 and 41.014).

Table 1
Descriptive Statistics for The Dependent Variable

	Group	Mean	Standard Deviation	N
Pretest	COL	41.517	12.620	29
	CG	41.074	12.447	27
	Total	41.304	12.424	56

The result of the univariate F test indicated that there were no significant $(F_{(1,54)} = .017, p > .05)$ between the COL and CG students. Therefore, the assumption that the COL and CG students across the two groups are equivalent in the pretest was met.

Table 2:
Mean Score For Post Performance Assessment On Collaborative Online Learning In Economics

Dependent Variable		COL N = 29	CG N = 27
Performance	Mean	63.793	62.407
	SD	14.799	14.369
	Adjusted Min	63.697[a]	62.511[a]
	Std. Error	2.748	2.765

Covariance = 41.304. Total Mean Score = 100.

Table 2 showed the means, standard deviations, adjusted means and standard errors of performances. The mean score of COL (mean = 63.793, SD = 14.799, Adj. mean =63.697) on

post performance assessment performed significantly higher than CG (mean = 62.407, SD = 14.369, Adj. mean =62.511).

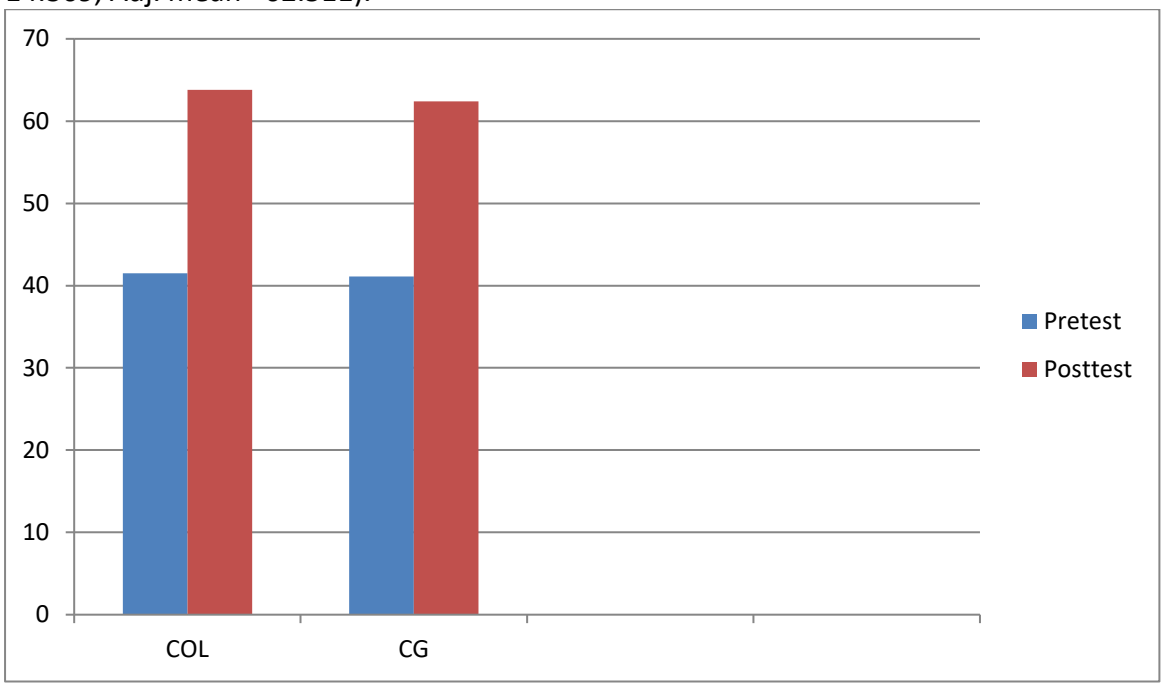


Figure 1: Summary on Pretest and Posttest

The overall result of these mean scores indicated that experimental groups COL indicated a greater improvement in posttest compare with control group CG revealed in Figure 1.

Table 3 :
Summary of ANCOVA Result

DV Effect	Univariate F	p Value
Group Effect		
Performance	49.105*	.000 df = 2, 53
Pretest	9.277*	.004

** significant at $p < .05$, $R^2 = .151$ (adjusted $R^2 = .119$)*

The ANCOVA results of comparing two groups on the dependent variables revealed in Table 3 explained that there were statistically significant differences between groups and the dependent variables (performance). The ANCOVA results also indicated that there was statistically significant difference in the dependent variable (performance). The significant $F_{(2, 53)} = 49.105$, (p <.05) indicated that the collaborative online learning had a main effect on performance.

The result above revealed there was significant difference between groups. This significant different reflects COL differ from CG and hypothesis null should be rejected.

Group Cohesiveness Questionnaire Outcomes

Table 4

The Analysis of Group Cohesiveness Questionnaire

No. Item	Pre-experiment COL	Pre-experiment CG	Post-experiment COL	Post-experiment CG
1.I **don'**t feel comfortable with the other members of this group.	2.000	1.519	1.414	4.482
2. I feel strongly tied to this group.	3.690	3.630	3.345	3.000
3. I **don't** feel this group important.	1.724	1.667	1.655	1.481
4. I feel this group worked well together.	3.655	3.519	4.172	3.852
5. I **don'**t fit in well with the other members of this group.	1.966	1.704	1.759	1.519
6. I see myself as part of this group.	3.690	3.889	4.310	3.963
7. I am glad to belong to this group.	3.690	4.000	3.900	1.741
8. I feel proud to become part of this group.	3.414	3.926	4.414	4.444
9. I think this group worked well together.	3.241	3.296	4.414	4.407
10. I feel **bore** become part of this group.	1.931	1.444	1.690	1.590

*in bold are the negative items

The result of the group cohesiveness questionnaire are reported in Table 4. The result indicated that the students in COL were closely involved in the collaborative learning and work well together compare with CG. In short, the result revealed that the COL groups are fairly high cohesive in the positive item such as 4, 6, 7, 8 and 9. It means that the group member like to tie together and feel belonging to the group. However, the students in COL and CG both showed the decreasing of mean on item 2. All the result in questionnaire can be summarized in Figure 2, it indicated that students in COL have fair improvement in mean score for the positive items compare with CG.

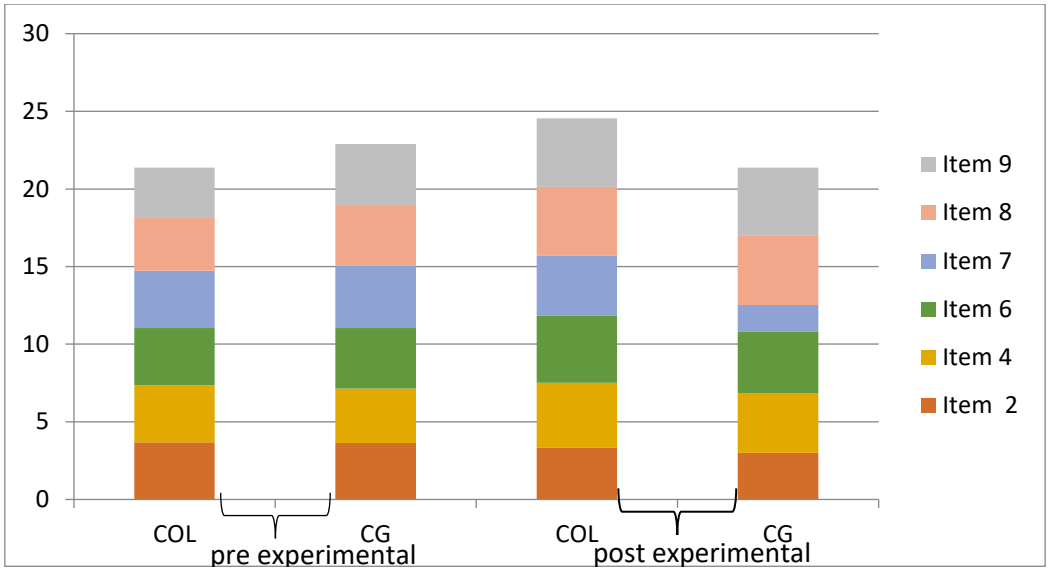


Figure 2: Comparison on Pre-experimental and Post Experimental (positive item)

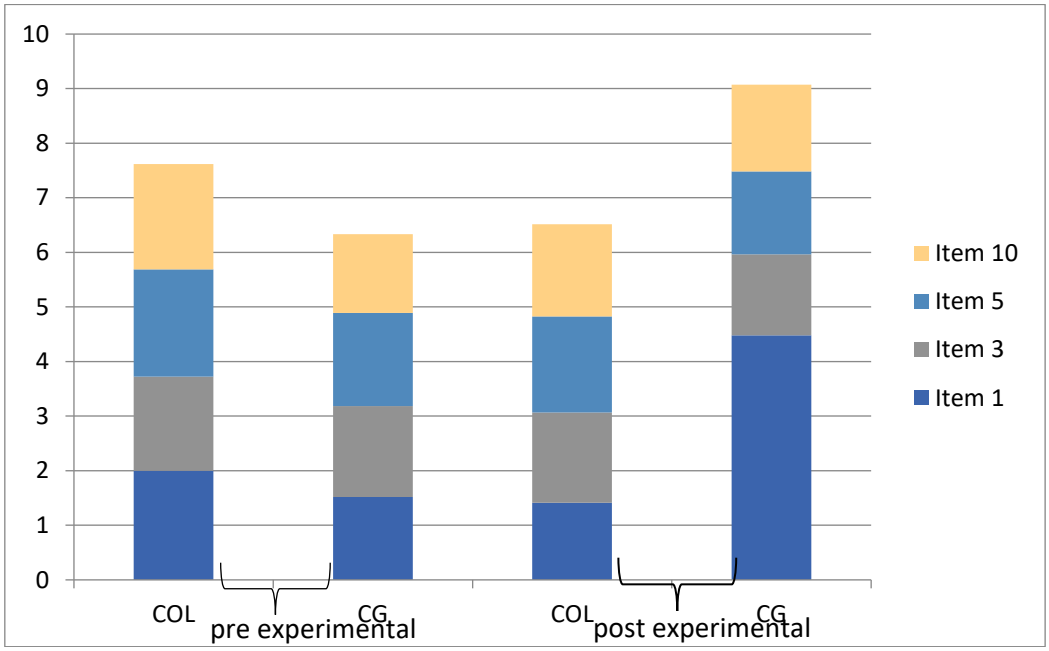


Figure 3: Comparison on Pre-experimental and Post Experimental (negative item)

However, for the negative item such as, 1, 3, 5 and 10 in Figure 3 revealed that CG groups had high mean score in negative items. It means that the group members didn't feel comfortable or important in the group. On the other hand, the COL groups students showed the decreasing of mean on negative item compare with pre experimental.

Discussion

Hypothesis 1 had been rejected. The results showed that a positive effect significant on academic performance. Students taught in COL method outperformed CG in academic performance.

A collaborative learning can stimulate critical thinking (Gokhale, 2001), such as COL. Students who used COL approaches involved in deep learning were personally involved in the

discussion and fostering their economic thinking. These students could understand the economic concept thoroughly. On the other hand, deep learning arises better conceptual understanding and students would score good results. This findings contradicted with Johnston et al. (2000) views which showed no difference in academic achievement among Asian students after implementing collaborative learning. However, the recent finding results showed Asian students were outperformed performance test after implementing COL.

For the COL groups, the positive item was higher than the CG groups on all except item 12. The main reason is COL members didn't have chances to meet face to face during discussion, whereas, CG members didn't accountable to each other so close. The result also indicated lower mean for the negative item for the COL group than CG. In sum, the findings showed that COL groups could discuss together easily.

Conclusion

COL designed to engage and provide students an learning environment to propose, discuss, evaluate and refine ideas. It also facilitates communication between the instructor and students to enhance the deeper understanding of economy concept. The usage of COL in economy pedagogy provides a real increase in the quality of education. It also enhances meaningful learning. The findings of this study indicate a positive effect of implementing COL. COL also add weight to the lectures for this era IT. Undergraduates may contact with their peers and lecturers through online conference, email and forum. They will become the collaborative partners in the knowledge-building process by contributing ideas and thought.

The lecturer is able to communicate effectively with many students at the same time through the online conference. It will help the lecturer to solve the problem that face by the students immediately. Future research should also investigate the extension of COL by involving discussion groups from other universities. Finally, COL group members have new learning experience and grow as collaborators and members of the online community.

Acknowledgements

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