

# Online Classroom of Tomorrow: The Effectiveness of Collaborative Problem-solving using Edmodo

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**Abstract:** *The aim of this study was to examine the use of online collaborative problem-solving for promoting the performance among Economics students. In addition, the effect of Collaborative Problem-solving using Edmodo was examined. A follow-up interview after the interventions was carried out to examine students' own perceptions of this method. This study employed the mixed method explanatory design. Quantitative study used the descriptive method and interviews were employed in the qualitative method. A total of 112 students from a public university in Malaysia was selected randomly as samples. The findings of the quantitative results revealed a significant result of students' academic performance and collaborative problem-solving skills. Future research can focus on communication skill and teamwork skill during students' discussion.*

**Keywords:** *Edmodo, Collaborative Problem-solving, mixed method explanatory design*

## INTRODUCTION

Groups has become a key factor to enhance their social skill and teamwork skill. Strong teamwork skill can be developed and incorporated in the collaborative online assignment. Strong teamwork begins with trust and clear communication. Among all the social media, researchers noted that Edmodo has enhanced the relationships between students, and has produced a stronger online classroom community (Khaleel, 2015; Mills, 2011). Students can also share learning materials, submit assignments and quizzes, and receive lecturers' feedback and notes (Tavukcu, 2018).

Among all the social network tools, Edmodo is a free and secure educational learning network (Fatimah, 2014). It has a similar function as Facebook. However, Edmodo has been designed a little differently from Facebook where it has a secure and private learning setting. Edmodo provides a simple method for lecturers to produce and run an online classroom community as well as enables students to connect and work with their peers in groups anywhere and anytime. Edmodo also allows lecturers to form small groups in the virtual class by using laptop or smart phone. Students can communicate with others all over the world by using Edmodo.

### Problem statement

The findings of Heijlities, Van Grog, Leppink and Pass (2014) indicated that the economic graduates do not have deep understanding of the economics concept and reasoning ability compared to the normal graduates. They also found that most of the economics classes only emphasize on mathematics calculation and techniques to the detriment of economics reasoning ability.

In fact, prior research has shown (Fukuzawa, & Boyd, 2016) that undergraduate learning can be problematic particularly with respect to large classes, students' participation, limited teaching time and lecturers' attitude. One of the common problem was limited opportunities for students' participation during discussion as there was a tendency for the lecturer to tell them the answers instead of allowing students to develop their own answers (Svinicki & McKeachie, 2013). Most of the lecturers thought that they were great instructors and they had limited time in one day due to their heavy work load. Therefore, to give the students the answer was the fastest way to complete their task. However, the lecturers did not realize that they had duplicated and implemented the pedagogy from the traditional teaching in the online

collaborative learning environment. As a result, an effective online collaborative learning approach needs to be implemented in the online learning environment.

### **Purpose of the Study**

This study examined the use of online collaborative problem-solving to promote the performance among Economics students. In addition, the impact of Collaborative Problem-solving with Edmodo had been examined. A follow-up interview after the interventions was carried out to examine students' own perceptions of this method.

### **LITERATURE REVIEW**

According to the findings of Végh, Nagy, Zsigmond & Elbert (2017), Edmodo enhanced students' academic performance and motivation in learning. Both groups revealed a significant result towards Edmodo usage and integration at the end of the research. Based on the findings, it can be concluded that Edmodo supported learning and it should be embraced in order to support meaningful learning in the 21<sup>st</sup> century. Similar researches have been conducted by , McSweeney Collins, (2016) and Guillory, (2017).

Therefore, all educators should strive to create an online learning environment in order to be able to provide adequate education to meet the demands expressed by digital native students. The advancement of ICT and internet influence is the greatest advantage of the Edmodo interface. The use of Edmodo has become popular because it is user-friendly, and easy to learn for both teachers and students.

Besides that, another research's finding also stated that Edmodo has a great benefit in improving listening skill through the audio files uploaded (Wichadee, 2017). Edmodo is an educational platform for blended learning which suits 21<sup>st</sup> century educational tool that allows participators to learn anytime and anywhere. In contrast, this finding also revealed that instructor and peers did not use Edmodo much for interacting outside the classroom. Students might have preferred to use other methods, such as Facebook to connect with others.

The quantitative results showed students and teachers' extensive use of online resources for educational purposes (Alev Ateş, 2018). These results should remind educators to make use of online resources for educational purposes since students use them often. The result of the study (Khaleel, 2014) shows that incorporating Edmodo encourages both students' engagement and responsible learning when particular Edmodo features are employed. The findings also revealed that the students' preference of using Edmodo is mainly towards communication such as forum, discussions and also for online activities.

The results from Nagaletchimee, Muhammad Kamarul and Suraswaran (2018) showed that teachers benefitted from participating in the Edmodo groups as a community which allowed them to communicate with other teachers outside of their schools without the constraint of time or location, to share instructional resources and ideas, and to receive suggestions. According to Moktar (2018), Edmodo can provide abundant resources that are not restricted within a school or library. Learners could visit exhibitions online, read articles and participate in online learning. The findings of this research indicated that participants' performance is significantly improved by activity based on Edmodo.

As a result, the ability of Edmodo can support blended learning that opens the opportunity for educators to transform the traditional school system (Farha, 2016) to online learning. The students that participated in the process of finding knowledge in the Edmodo felt that they had made changes in the way they learned (Warawuhdi, 2017)

On the other hand, Edmodo is not only an excellent communication and social platform. It seems to be also quite a good gamification platform (Murar, 2015). Edmodo could build a sense of community in the classroom and promote students' self-confidence, and as a result, students would achieve better academically. Overall, the positives outweighed the negatives of implementing and using Edmodo in the classroom. Students seemed to enjoy using technology (Batsila, Tsihouridis & Vavougiou, 2014).

### **RESEARCH METHODOLOGY**

This study employed the mixed method explanatory design (Quan + qual). Quantitative study used the descriptive method and interviews were employed in the qualitative method. A quantitative analysis and a survey design were applied in the quantitative study in phase 1. The survey was employed to explore the use of Edmodo in online collaborative problem-solving. This study took 10 weeks to complete. Then,

interviews were carried out with five students in week 11 (phase 2). In this study, the mixed method design is engaged because the researchers wished to follow up the quantitative study with a qualitative one to obtain more detailed and specific information than the findings gained from the results of statistical tests. In addition, the qualitative data can be triangulated with the quantitative data, the interview findings also are rich, robust and well-developed. A total of 112 students from a public university in Malaysia was selected randomly as samples. Content and face validity had been measured to ensure a set of systematic assessments employed in this study. The instrument has a reliability of Cronbach's Alpha .884. Since the result of Cronbach's Alpha is higher than .70, it showed a high reliability standard (Sekeran & Bougie, 2010).

### Research Procedure

Before conducting the collaborative problem-solving with Edmodo, two training sessions were given to the lecturer and students before the implementation of the actual study. Preparation included introducing Edmodo and managing the lecturer's relevant skills of the new learning environment. The Collaborative Problem-solving took ten weeks to complete. The questionnaire was given to the students on the eleventh week. The students could participate in the online group discussion weekly but they had to post their views individually ( Figure 1). The learning materials were sent to the students through Edmodo one week before the discussion began. All the discussions were related to current issues with global economics. Students needed to form groups and discussed in their respective collaborative group. A follow-up interview was conducted to interview five students.

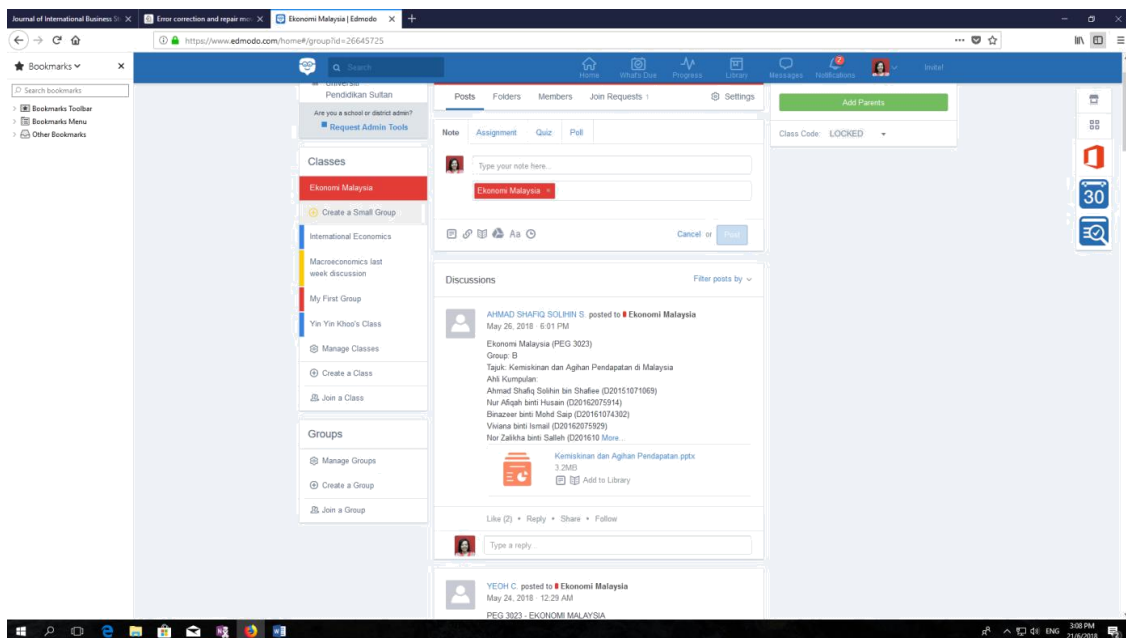


Figure 1: Edmodo

## RESULTS

Table 1 reveals the result of the students' performance after they were engaged with Edmodo.

The findings in Table 1 revealed that the mean score of the students' performance was 77.428.

Table 1 Students' Performance after Engaging with Edmodo

Variable	N	Mean	Std. Deviation
Performance	112	77.428	8.832

Table 2 t- test towards students' academic performance

Variable	t test	df	Sig. (2-tailed)
Performance	92.774	111	.000

Table 2 shows the findings of the t test towards students' academic performance. The findings revealed a significant result of t-value ( $t = 92.774$ ,  $p = .000$ ). It showed a significant result after implementing the Edmodo collaborative learning.

On the other hand, all the students were required to respond to the questionnaire after implementing Edmodo collaborative problem-solving. A total of 112 participants answered the 30 items in the questionnaire to show their views on their interest of learning with Edmodo, effectiveness of using Edmodo with collaborative problem-solving, and the assistance of Edmodo in self-directed learning. The findings based on the frequency and percentage of Edmodo towards collaborative problem-solving revealed that the majority of the respondents (61.6%) selected 'agree' for the item, "I like to use Edmodo for discussion" and 58% of the respondents selected 'agree' for the item "I am confident when using Edmodo". A total of 56.3% of the respondents agreed that "I can receive info from lecturer from time to time" However, 42% of the respondents selected 'strongly disagree' and 36.6% 'disagree' in the negative item "I won't use Edmodo anymore."

In addition, the findings showed positive results from item 1-30. In summarising the average percentage of the 30 items, 47.6% of the respondents selected 'agree', 24.5% selected 'strongly agree' followed by 22.08% with 'neutral', 3.76% selected 'disagree' and 1.7% respondents selected 'strongly disagree'. Most of the respondents selected 'agree' throughout the items. The detailed findings are shown in Table 3. In addition, a summary of the results is presented in Table 4.

Table 3 Analysis of the Questionnaire (frequency table)

No.	Item	Frequency & percentage (%)					Total
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
1.	I like to use Edmodo for discussion.	0 (0)	0 (0)	20 (17.9)	69 (61.6)	23 (20.5)	112 (100.0)
2.	I am confident when using Edmodo.	0 (0)	0 (0)	28 (25.0)	65 (58.0)	19 (17.0)	112 (100.0)
3.	I can master the skill for online discussion.	0 (0)	1 (0.9)	38 (33.9)	59 (52.7)	14 (12.5)	112 (100.0)
4.	I learn the skill for collaborative problem-solving.	0 (0)	3 (2.7)	32 (28.6)	65 (58.0)	12 (10.7)	112 (100.0)
5.	I like to discuss with peers online.	0 (0)	1 (0.9)	31 (27.7)	63 (56.3)	17 (15.2)	112 (100.0)
6.	I like collaborative problem-solving.	0 (0)	2 (1.8)	29 (25.9)	61 (54.5)	20 (17.9)	112 (100.0)
7.	Work in group is better than work alone.	0 (0)	1 (0.9)	19 (17.0)	42 (37.5)	49 (43.8)	112 (100.0)
8.	Edmodo helps us in solving problem.	0 (0)	1 (0.9)	22 (19.6)	60 (53.6)	29 (25.9)	112 (100.0)
9.	I can get the resource easily from Edmodo.	0 (0)	1 (0.9)	12 (10.7)	61 (54.5)	38 (33.9)	112 (100.0)

10.	Discussing online is fun.	0	2	17	53	40	112
		(0)	(1.8)	5.2 <sup>(1)</sup>	(47.3)	(35.7)	(100.0)
11.	I solve the economics problem.	0	0	31	65	16	112
		(0)	(0)	(27.7)	(58.0)	(14.3)	(100.0)
12.	I learn the economics theory with Edmodo.	0	7	27	53	25	112
		(0)	(6.3)	(24.1)	(47.3)	(22.3)	(100.0)
13.	I spend more time with Edmodo.	1	11	63	31	5	112
		(0.9)	(9.8)	(56.3)	(27.7)	(5.4)	(100.0)
14.	I like to post questions with Edmodo.	1	8	59	41	3	112
		(0.9)	(7.1)	(52.7)	(36.6)	(2.7)	(100.0)
15.	I can reach my instructor easily.	0	3	13	63	33	112
		(0)	(2.7)	(11.6)	(56.3)	(29.5)	(100.0)
16.	I read the materials posted in Edmodo.	0	1	10	64	37	112
		(0)	(0.9)	(8.9)	(57.1)	(33.0)	(100.0)
17.	I start to put "like" in Edmodo.	1	4	29	52	26	112
		(0.9)	(3.6)	(25.9)	(46.4)	(23.2)	(100.0)
18.	I can learn without help in Edmodo.	6	15	49	34	8	112
		(5.4)	(13.4)	(43.8)	(30.4)	(7.1)	(100.0)
19.	I can learn freely in Edmodo.	0	0	21	56	35	112
		(0)	(0)	(18.8)	(50.0)	(31.3)	(100.0)
20.	I can interact with my friend easily.	0	2	21	59	30	112
		(0)	(1.8)	(18.8)	(52.7)	(26.8)	(100.0)
21.	I can receive info from lecturer from time to time.	1	2	45	63	1	112
		(0.9)	(1.8)	(40.2)	(56.3)	(0.9)	(100.0)
22.	I read the materials in Edmodo.	0	0	10	62	40	112
		(0)	(0)	(8.9)	(55.4)	(35.7)	(100.0)
23.	I won't use Edmodo anymore.	47	41	8	12	4	112
		(42.0)	(36.6)	(7.1)	(10.7)	(3.6)	(100.0)

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24.	I check the Edmodo regularly.	1 (0.9)	6 (5.4)	32 (28.6)	55 (49.1)	18 (16.1)	112 (100.0)
25.	I use to discuss with my friends about the topic.	0 (0)	2 (1.8)	28 (25.0)	61 (54.5)	21 (18.8)	112 (100.0)
26.	I try to explore more about Edmodo.	0 (0)	1 (0.9)	22 (19.6)	60 (53.6)	29 (25.9)	112 (100.0)
27.	I try to search more materials for my discussion.	0 (0)	2 (1.8)	9 (8.0)	75 (67.0)	26 (23.2)	112 (100.0)
28.	Edmodo is a good platform for collaborative problem-solving.	0 (0)	1 (0.9)	12 (10.7)	60 (53.6)	39 (34.8)	112 (100.0)
29.	I will recommend Edmodo to others	0 (0)	1 (0.9)	8 (7.1)	53 (47.3)	50 (44.6)	112 (100.0)
30.	I will use Edmodo for other courses.	1 (0.9)	2 (1.8)	17 (15.2)	52 (46.4)	40 (35.7)	112 (100.0)

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The summary of the results is shown in Table 4.

Table 4 Summary of the Questionnaire

Item Mean	
Interest towards Edmodo (20 items)	3.8683
Using Edmodo for collaborative online learning (10 items)	4.0036

The principle axis factor analysis with varimax rotation was conducted to examine the underlying structure for the 30 items of Edmodo questionnaire. The questionnaire was checked the normality test and met the criteria of all the assumptions. The items of the questionnaires were designed to index three constructs: interest of learning with Edmodo, effectiveness of using Edmodo with collaborative problem-solving, and the assistance of Edmodo in self-directed learning. After rotation, the first factor accounted for 40.54% of the variance, the second factor accounted for 15.684 and the third factor explained 4.7965%. The result of KMO and Bartlett's Test is acceptable because KMO revealed .756 is > than .5.

Table 5 Component Loading for the Rotated Components (N=112)

Item	Component Loading			Communality
	1	2	3	
I like to use Edmodo for discussion.	.777			.698
I like to discuss with peers online	.738			.601
I can master the skill for online discussion.	.731			.593
I learn the skill for collaborative problem solving.	.709			.737
I am confident when using Edmodo.	.675			.719
I like collaborative problem solving.	.672			.736
Work in group is better than work alone.	.651			.740
I can get the resource easily from Edmodo.	.638			.750
Edmodo helps us in solving problem.	.612			.726
I solve the economics problem.	.591			.753
I learn the economics theory with Edmodo.	.569			.736
I try to explore more about Edmodo.		.745		.801
I read the material in Edmodo.		.708		.688



I check the Edmodo regularly.	.609		.725
I will use Edmodo for other courses.	.589		.732
I can receive info from lecturer from time to time.	.522		.710
I will recommend Edmodo to others	.412		.750
I can interact with my friend easily.	.339		.642
I can learn freely in Edmodo.		.716	.651
I can learn without help in Edmodo.		.672	.706
I like to post questions with Edmodo.		.611	.750
Discuss online is fun.		.519	.595
I can reach my instructor easily.		.478	.748
I spend more time with Edmodo.			.755
I read the material posted in Edmodo.	.406		.695
I start to put "like" in Edmodo.	.354		.644
Eigenvalues	13.078	9.254	2.829
% of variance	22.168	15.684	4.796

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Table 5 displays the items and component loadings for the rotated components, with loadings less than .25 omitted to improve clarity. Three components were rotated, based on the eigenvalues over 1 criterion. After rotation, the first component accounted for 22.168% of the variance, the second component explained 15.684% of the variance and the third component explained 4.796%.

The interviews were carried out after the implementation of collaborative problem-solving using Edmodo. The questions posed to the students were the advantages they gained while engaging in collaborative online learning using Edmodo. The students found that this app was user-friendly, interesting and easy to get in touch with their peers in the class or all over the world. The students also believed that Edmodo helped in their studies and their Economics' result has improved.

#### Paragraph 2

*G2: Yes. Edmodo is user-friendly if compare with*

*Myguru and Myupsi portal. It is really interesting.*

*This app also a little different with the other apps.*

*G3: I found that Edmodo is an effective learning platform. It allows us to carry out collaborative online learning easily.*

*B4: Edmodo is good for learning. It helps in my study.*

*B5: Edmodo is very effective. Edmodo is just like Facebook, I can read the material and write down the comment. I can post it and like the material.*

Analysis across the students' responses revealed that the majority of them found that Edmodo enabled them to keep in touch with the lecturer and peers easily.

#### Paragraph 3

*G2: I like to contact with my peers with Edmodo. It is fast and effective. My results improve after using Edmodo.*

*G3: It is very difficult to interact among us because we all have different schedule. However, Edmodo has overcome this problem, we can meet each other easily.*

*B4: I feel Edmodo is easier to use in group discussion. It also provided a lot of information.*

However, G1 had a different opinion. She stated,

*G1: I will rather have face to face discussion rather than online discussion. I prefer to meet my friends in the café.*

For the question that asked the students whether they would like to continue Edmodo in other courses, all of them shared the same view that they hoped to continue using collaborative problem-solving with Edmodo. Some of them hoped that other lecturers would implement the same method. One of the boys said that he would continue to use Edmodo because it was easy to have group discussion.

*G1: I don't like to read the notes on paper. Edmodo can produce a paperless online environment.*

*G2: Edmodo is good because it can downloaded from the apps store easily.*

*G3: I suggest that other lecturers should use Edmodo as well because it really helps in study. It can promote self-directed learning.*

*B4: I suppose not many people know about Edmodo, it can promote to have more user.*

*B5: I will continue to use Edmodo because it helps in my study. I can do my assignment, group discussion. I love to discuss with Edmodo because it is very simple and easy.*

## DISCUSSION

Collaborative problem-solving had significant result in promoting students' performance. After implementing the collaborative problem-solving with Edmodo, students showed good performance in their Economics test. They obtained significant results of t-value ( $t = 92.774$ ,  $p = .000$ ) and mean score for 77.428. The interview with the students also revealed the same results.

*B4: Edmodo is good for learning. It helps in my study.*

*G2: I like to contact with my peers with Edmodo. It is fast and effective. My results improve after using Edmodo.*

Prior study indicated that Edmodo enhances students' performance. It can allow students to interact with lecturers and peers anytime and anywhere. This study has shown the same results with the findings of Végh, Nagy, Zsigmond & Elbert (2017). Based on the data analysis and discussion, it can be concluded that Edmodo supports collaborative problem-solving that meets the demands of the 21<sup>st</sup> century for meaningful learning. Similar researches have also been carried out by McSweeney Collins (2016), Hursen (2017) and Manal (2017).

The use of Edmodo as a learning platform has become more and more common and it can create self-directed learning and social constructive learning. The transformation learning of face-to-face learning to online learning is the new era learning mode.

On the other hand, prior studies (Oyelere, Paliktzoglou & Suhonen, 2016; Yusuf, Yusuf, Erdiana, & Pratama, 2018). indicated that the success of the collaborative online learning depends on the group size. Chee (2014) asserted that Edmodo is a free, digital classroom application that allows teachers and students to interact collaboratively with academic information. Thus, the potential of Edmodo to be used as a collaborative learning platform should be made available to all educationists and students to unlock their learning potentials. In addition, Edmodo also can lead students to a research-led, innovative, internationalised learning environment where they have chance to meet with friends all over the world. It helps to shape changes in the modes of learning.

On the other hand, Edmodo showed a significant result in promoting students' collaborative problem-solving. From the analysis, students showed a positive influence from using Edmodo, the average percentage of the 30 items, 47.23% of the students selected 'agree' and 21.17% of the students selected 'strongly agree'.

Analysis from the interviews' report strongly supported the quantitative findings. The interview with the students revealed that,

*G3: I found that Edmodo is an effective learning platform. It allows us to carry out collaborative online learning easily.*

*B5: Edmodo is very effective. Edmodo is just like Facebook, I can read the material and write down the comment. I can post it and like the material.*

The findings from both the quantitative and qualitative indicated that Edmodo is an effective learning platform. It enhances collaborative online learning easily. The students engaged themselves in the virtual learning environment easily because they could read the learning materials from Edmodo, write down the comments and post the materials.

The findings are similar with the prior research of Gan, Menkhoff, & Smith (2015) who opined that Edmodo is an interactive digital platform that enables students and teachers to interact collaboratively, and has an impact on students' achievement Durak (2017) and Shams-Abadi, Ahmadi, & Mehrdad (2015) also shared the same views that one of the advantages of using Edmodo is developing collaborative abilities among students. Since Edmodo is an online learning community, every group member registered online can be connected to the others easily. They also emphasised that Edmodo is a free, digital classroom application that allows teachers and students to interact collaboratively with academic information.

Students and teachers have the capability to interact and complete assignments anywhere and anytime. The application can be downloaded on almost any electronic device such as a computer or smartphone.

## CONCLUSION

The findings of this study have implication for educators, especially in term of designing a blended learning classroom. The implementation of Edmodo in the classroom enhances students' performance, collaborative problem solving skills and interest seemed practically significant. Recent research has revealed the similar results with the findings (Trust, 2017) which Edmodo enhances the students' academic performance. In addition, the ability of Edmodo can support blended learning that opens the opportunity for educators to transform the traditional school system (Farha, 2015) to virtual learning. On the other hand, the findings about Edmodo also promotes collaborative problem solving. This result has shared the same view with Theodosiou (2016). Edmodo provides a learning platform to students not only can learn anytime and anywhere but also becomes the eye-opener with the knowledge from the resources. The students got chances to know the friends from all over the world with same level within their fingertips.

The findings from the research are worthy for further studies to be conducted to ascertain more conclusive results by the researchers. Another area of future research may be the aspect of teamwork skills in collaborative problem-solving. In addition, the communication skills in collaborative problem-solving can be measured too.

The future study may also focus more on qualitative research, for example the interview with the facilitator. Data collection only focused on undergraduates in the recent study, an extension study can be carried out with high school students as well.

In short, this study has added some new insights of Edmodo specifically the use of Edmodo in Economics class among undergraduates with collaborative problem-solving skills. The methodology that was used in the study was slightly different from the previous study.

The mix method research was conducted in the study. The qualitative research has gathered a lot of information that the previous research did not cover. In short, Edmodo is a free, user- friendly learning platform.

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