4. Results and Discussions

Discussion is a dynamic, active process where learners have to make sense of the upcoming information and promptly give optimal, relevant responses. It usually leads to the creation of meaning and the construction of knowledge. Students who participate in classroom discussions are presumed to be more active and attentive to their schoolwork although they do not have many opportunities of communicating in English in class. In view of that, we believe that teacher involvement and facilitation from college students can provide guidance and tips and help students to lead a live, online discussion. Therefore, college students and teachers were involved in high school students' online discussion in the first study. On the other hand, although many experts contend that e-learning such as online discussions can help teachers manage their work and promote their teaching quality, we still have reserve. Because of extra workload, we assume that online discussions via Moodle would be threatening to teachers and turn them away. Thus, in the second study, we removed the role of teachers but kept college students who acted as a major facilitator in high school students' online discussions via Moodle. The results of the two studies as well as their comparison were shown in the following.

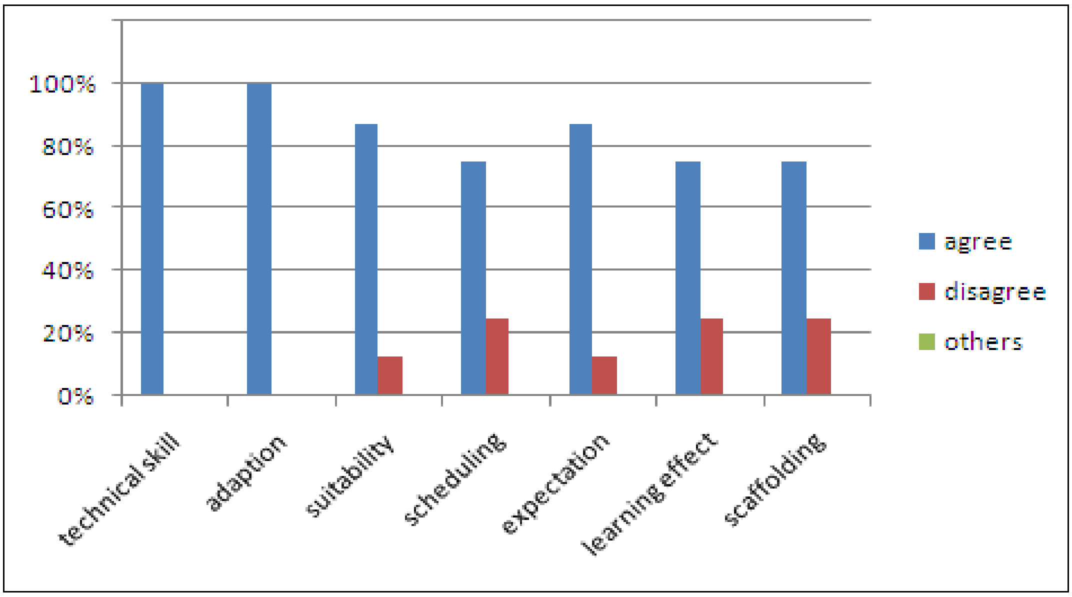
4.1 The Results of Study 1

Four aspects of research results were addressed correspondingly: the subjects' assessment of the online discussions via Moodle, behavioral intention, i.e. the UTAUT model, composition performance, and interactional discourse patterns of online discussions. The subjects' overall feedback was included.

(1) Students' Ability of Doing Online Discussions via Moodle

The questionnaire of the Assessment of the Online Discussions via Moodle contained four major parts: (1) technical skill (Questions 1, 2, and 6), (2) learning style (Questions 3, 4, and 5), (3) expectation and knowledge construction (Questions 7, 8, and 9), and (4) overall suggestions (Question 10). The assessment questionnaire, whose Cronbach's alpha value for internal consistency was .90, was used to know the subjects' overall responses to the online discussion forum via Moodle. As shown in Figure 15, in the technical skill, all of the subjects (100%) had no problems using the Moodle interface such as participating in the online discussion forum, retrieving reading materials online, or uploading and downloading the materials required. All of them claimed that the interface was very easy to use and instructions were clear to follow, so they did not have any technical problems when using it for the online discussions. In addition, all of the subjects (100%) felt well-adapted to the interface and the majority of them (87%) claimed that Moodle was a good learning interface. Only few of them (25%) mentioned that they sometimes forgot to do their assignment so that they lagged a little bit behind the schedule the teacher assigned. The Moodle interface was suitable for them in general (87%). As to the discussion content and knowledge construction, 87% of the subjects agreed that the online discussion activity met their expectation, and that they were inspired by the participants including their classmates, teachers, and college friends. Although 75% of the subjects stated that they did learn something from the activity, 13% of them indicated that their learning mostly came from their classmates and teachers.

Figure 15 The Results of the Assessment on Online Discussions via Moodle



(2) Students' Acceptance of Online Discussions via Moodle

We used the UTAUT model to examine the subjects' acceptance of online discussions via Moodle. However, the variables that the UTAUT model proposed seem contentious (Wu & Chen, 2006; Chang & Chu, 2011) when this model is adopted in Taiwan, equipped with the world's most advanced technologies and infrastructure. For that reason, we firstly tested the reliability for all scale items. Then, we used the correlation analysis to test whether all the variables influence one another as mentioned in the research of Venkatesh et al. (2003) or whether the factor of facilitating condition does not exist as Wu & Chen (2006) and Chang & Chu (2011) have insisted. Finally, we did regression analyses.

Table 5

Correlations among the Variables

	M	S.D.	Perform	Effort	Social	Facilitating
Perform	3.44	.798				
Effort	3.42	.922	.496***			
Social	4.16	.656	.388***	.439***		
Facilitating	3.90	.719	.533***	.542***	.572***	
Behavior	3.67	.797	.534***	.567***	.595***	.760***

Note1. Perform indicates performance expectancy, while Effort stands for effort expectancy, Social (for social influence), Facilitating (for facilitating conditions), Behavioral (for behavioral intention); 2. *p < .05; **p < .01; ***p < .001

Table 5 revealed that the variables were highly correlated (p <.05). The value of Cronbach's α to evaluate the set of scale items was .8659. Such a result indicated that the variables (namely performance expectancy, effort expectancy, social influence, and facilitating conditions) could be used to predict the subjects' behavioral intention to use Moodle. Next, we used the regression analyses to answer the research question. As shown in Table 6, the overall models were significant (the F-value of the variables were respectively 37.843, 11.124, 11.045, and 22.537, p < .05) and so were the values of β (performance expectancy = .963, effort expectancy = .468, social influence = .607, and facilitating conditions = .778, p < .05). Obviously, the results of the regression analyses pointed that each of the variable significantly influenced the subjects' behavioral intention in the use of Moodle.

Table 6

The Prediction of the Acceptance of Online Discussions via Moodle

	Behavioral Intention			
PerExpect	.963***			
EffExpect		.468**		
SocInflu			.607**	
FaciCond				.778***
R^2	.542	.258	.257	.413
F-value	37.843***	11.124**	11.045**	22.537***

1. PerExpect (Performance Expectance), EffExpect (Effort Expectance), SocInflu (Social Influence), FaciCond (Facilitating Conditions); 2. *p < .05; **p < .01; ***p < .001

(3) Students' Pedagogical Success in English Writing

The essays in the first study were rated by two teachers on the basis of the checklist offered by Longwood University. To establish inter-rater reliability from time to time to assure that raters aren't changing, we used the Kappa statistic; the interrater reliability for the raters was found to be Kappa = 0.72, 95% CI=0.42-1.00. Then, we employed the Paired Samples T Test to compare the means of two variables (the scores of the first essays, i.e. pretest, and the scores of the last essays, i.e. posttest).

Table 7 displayed the results. We found that there was a significant difference between the pretest and posttest (p < .001). The means of the pretest was 49.88, whereas that of the posttest was 70.08. In fact, 11 subjects (31%) gave up writing an essay at the beginning, whereas only 1 did not finish the writing assignment at the end. In addition, the pretest example indicated that the subjects did not have any sense of writing such as the organization, format, and even the font, whereas the posttest example demonstrated that the subjects did learn how to write a composition.

Table 7

The Comparison of the Composition Performance between Pretest and Posttest

	Mean	SD	SE	t-value	df	sig
pretest	49.88					
posttest	70.08					
Pretest-Posttest	-29.21	33.71	5.78	-5.05	33	.00***

N= 34; ****p* < .001

The example below showed that the student did not have a sense of composition, not only the format but also the content. This essay implied that there was no difference between discussion and composition. However, in the posttest, she had built up a concept of composition though there was still room for improvement.

Examples

Pretest (First essay)

I think the most I appreciate in art is music.I love Cheer Chen's music.

Many people may consider that the art of music is classic.But I think that-

no matter what type of music you love,as long as the music can touch you,and it's the art of music that belongs you.

The most-most can touch me of the song named "Still lonely"(還是會寂寞).

It's a little bit strong rhythm,and the soft voice just forms the striking contrast.

I don't know why,but it is just so touching.

It's a song that I just want to follow it to express my feelings of my own.

Posttest (Final essay)

Yingge, one of a famous tour spot in north Taiwan, is well-known for its potteries. There you can find every kind of pottery in the Yingge Town.

In 1805, Yingge was found the mud there are appropriate for making potteries. What's more, there they also produce coal mine that can bake potteries. Therefore, people in Yingge made their own golden age. Before long, Yingge even established a vocational school to educate people to continue the skill to the next generation.

Now when you come to Yingge, you have to visit some spot. First, when you are there you must make hand-made pottery by yourself. It's a joy you can design the shape you like and make it on your own. Second, you should go to the pottery museum. There are a number of works displayed there. Last, you can shop on the pottery street, they sell many kinds of stuff about traditional things. And you'll have a unforgetful trip.

(4) Interactional Discourse, Frequency, and Word Length

Interactional discourse patterns are an indicator to show students' capability of discussion, whereas frequency of participation in online discussion and word length explain their automatic attitude and development. The results of the subjects' interactional discourses patterns, discussion frequency, and length of words in the first study were reported below.

Table 8

The Results of the Online Discussions Routine via Moodle in Study 1

Types	**Discussion1**	**Discussion 2**	**Discussion 3**	**Discussion 4**	**Discussion 5**
Frequency	21 times	25 times	17 times	10 times	6 times
Length of words	39.9 w/t	51.4 w/t	55.8 w/t	49.8w/t	62.57 w/t
Codes of Discourse	C1= 75% C2=25%	C1=85% C2=15%	C1=62% C2=38%	C1=72% C2=28%	C1=78% C2=22%

N= 34

In the subjects' interactional discourse~~s~~ patterns, decoded according to the Model of the Interactional Analysis (Gunawardena et al., 1997), we found that most of the subjects sustained their discourse patterns in the first two phases (Table 8). The proportion of the first-phase discourse pattern was much more than that of the second-phase one. That is to say, the subjects could share information about discussion topics or discover and explore inconsistency among participants. For example,

"*Well…there are many houses built in the world and that mean[s] space to live in gradually become[s] less, so I don't want one in order not to waste space although it is eco-friendly. Besides, it needs a particular weather that maybe I can't stand* (**C1,** 71)."

"*I think I am interest[ed] [in] this portrait's background more than th[at] portrait['s]. The background of Mona Lisa's smile really makes me curious* (**C2,** 102)."

Though most of the subjects had appropriate responses in discussions. Unfortunately, they neither negotiate meaning nor co-construct knowledge or test and modify the proposed synthesis or co-construction, needless to mention the application of the knowledge they could construct newly. The results of the IAM patterns revealed that advanced interactive and communicative skills were absent from the subjects' online discussion discourses.

In respect to the participation frequency of online discussions via Moodle, we found that participation ranking list of the five discussions was discussion 2 (25 times), discussion 1 (21 times), discussion 3 (17 times), discussion 4 (10 times), and discussion 5 (6 times). Although the subjects' participation in the second discussion ranked the most, something very interesting was found: the length of words in each discussion on average was on the increase in each sequential discussion (39.9 words/time, 51.4 words/time, 55.8 words/time, 49.8 words/time, and 62.57 words/time)

4.2 The Results of Study 2

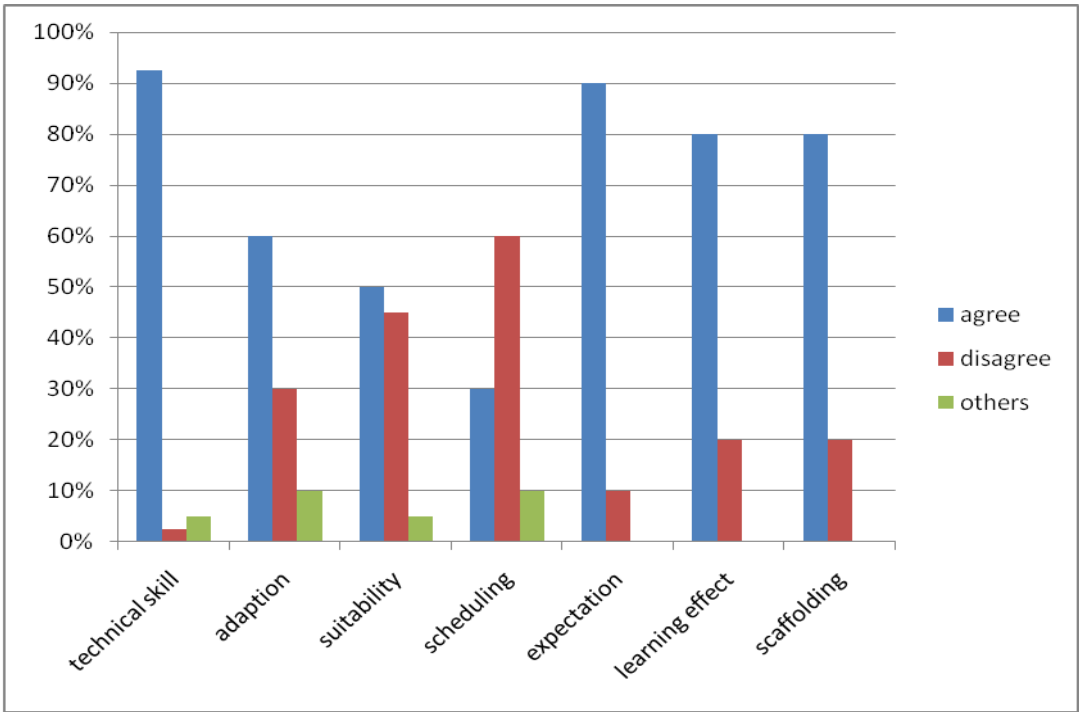
The second study was similar to the first one except the role of teachers. Therefore, the results of the second study not only includeds the answers to four research questions, the same as those in the first study, but they also presents the comparison of the results between Study 1 and 2.

(1) The Assessment of the Online Discussions via Moodle

In the Assessment of the Online Discussions via Moodle questionnaire, used in the second study, the question items were the same as those in the first study: (1) technical skill (Questions 1, 2, and 6), (2) learning style (Questions 3, 4, and 5), (3) expectation and knowledge construction (Questions 7, 8, and 9), and (4) overall suggestions (Question 10). The assessment questionnaire, whose Cronbach's alpha value for internal consistency was also .90, was used to examine the subjects' overall responses to the online discussion forum via Moodle.

As shown in Figure 16, most of the subjects (93%) did not have any technical problem when using the Moodle interface and participating in the online discussion forum. If they (7%) did, it was because they could not understand some of the reading articles required. However, only 60% of the subjects felt that they could adapt to the activity of online discussions via Moodle. The percentage dramatically decreased much more than that of the first study overall (100%). Even worse was that only half of the subjects (50%) agreed that online discussions via Moodle were suitable for them. Many of the subjects (60%) argued that they easily lagged behind the schedule to join online discussions and to write an essay after each of the discussions. Extraordinarily, it was found that the majority agreed that online discussions via Moodle met their expectations (90%) and brought a learning effect to them (80%), and classmates' and college students' scaffolding effect (80%) was positive as well.

Figure 16 The Results of the Assessment on Online Discussions via Moodle in Study 2

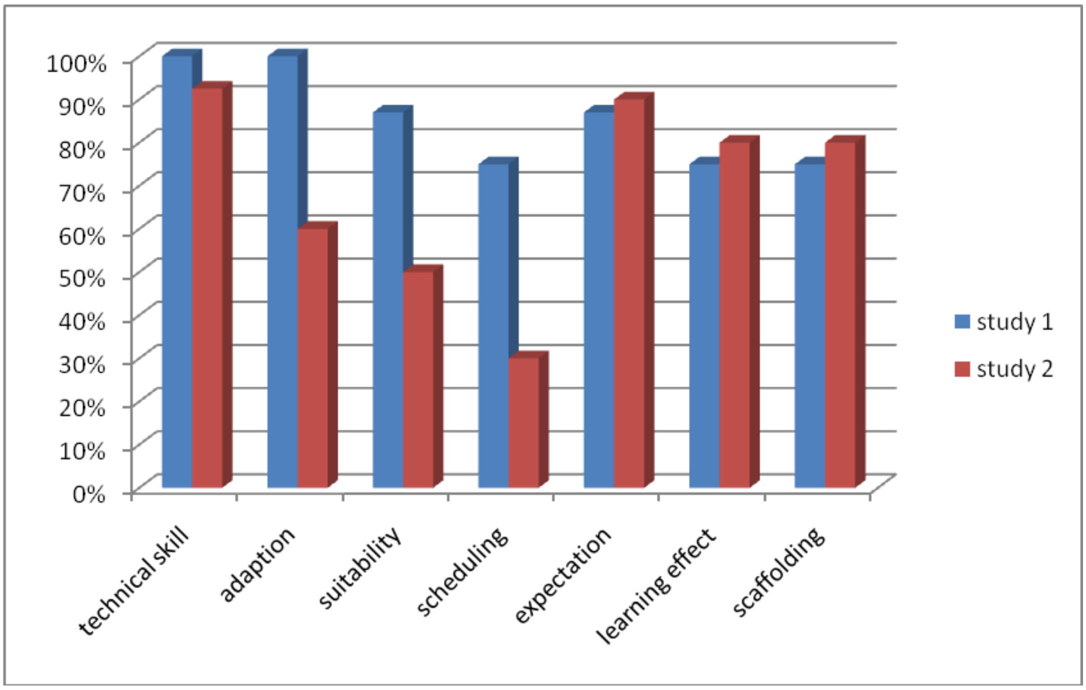


Comparisons: Study 1 and Study 2

As aforementioned, the contents of the Assessment of the Online Discussions via Moodle questionnaire concerned technical skill, adaption, suitability, scheduling, expectation, learning effect, and scaffolding.

Figure 17 indicates that except the subjects' adaption, suitability, and scheduling, two groups of the subjects (namely, groups from Study 1 and Study 2) did not show much difference. That is, both of the two groups had enough technical skill to conduct online discussions via Moodle. Meanwhile, both had high expectation about the activity; they believed that they could have the scaffolding effect and learning effect when participating in online discussions via Moodle. However, the two groups had different senses of adaption and suitability. For the first group of the subjects, it made sense when the factors of adaption, suitability, scheduling, expectation, learning effect, and scaffolding were positively correlated. In contrast, the second group of subjects had no problem conducting the online activity and believed it could benefit them (high expectation and beliefs in the learning effect and scaffolding). Ironically, they felt overscheduled and not being able to adapt themselves to the activity. Online discussions via Moodle seemed not to be suitable for them. Obviously, it was teacher involvement that led to different results. Teachers seemed to have power to influence their students' thoughts and a sense of adaption and suitability.

Figure 17 The Results of the Comparison between Study 1 and Study 2 in the Assessment on Online Discussions via Moodle



(2) The Acceptance of the Online Discussions via Moodle

Next, we used the UTAUT model and the TAM model respectively to examine the subjects' behavioral intention of using the Moodle interface in the environment of non-teacher involvement. In the model of UTAUT, we found that not all the variables were correlated, which is inconsistent with Davis (1989) (Table 9). However, in TAM model, we presumed that the variables of "perceived usefulness" and "perceived ease-of-use," "attitude," and "students' perceived convenience" all highly influence students' behavioral intention of using online discussions via Moodle. Although Davis (1989) argued "attitude" might not fully influence the user's behavioral intention, we believed it still somewhat influenced the subjects' intention. In addition, "perceived convenience" was not displayed and discussed in Davis's study (1989), but it was concerned in other studies (Cheolho & Kim, 2007; Hedman & Gimpel, 2010). The reliability test of the set of scale items showed that the Cronbach's α was .8078. Therefore, we firstly used the correlation analysis to examine whether the four variables (i.e. "perceived usefulness" and "perceived ease-of-use," "attitude," and "students' perceived convenience") were significantly correlated to the subjects' behavioral intention to use the technological tool, Moodle.

Table 9

Correlations among the Variables (UTAUT Model)

	M	S.D.	Perform	Effort	Social	Facilitating
Perform	3.00	.72				
Effort	3.39	.93	.000			
Social	3.39	.69	.579**	.291		
Facilitating	3.83	.77	.411*	.566**	.232	
Behavior	2.44	.81	.788***	-.160	.605**	.122

Note1. Perform indicates performance expectancy, while Effort stands for effort expectancy, Social (for social influence), Facilitating (for facilitating conditions), Behavioral (for behavioral intention); 2. *p < .05; **p < .01; ***p < .001

Table 10

Correlations among the Variables (TAM Model)

	M	S.D.	PCONV	PUSEFUL	PEASE	ATTIT
PCONV	.7195	.7195				
PUSEFUL	.7413	.7413	.562***		.	
PEASE	.6456	.6456	.342*	.102*		
ATTIT	.6482	.6482	.568**	.446**	.482**	
INTENT	.7005	.7005	.420*	.403*	.582**	.694**

1. PCONV (Perceived Convenience), PUSEFUL (Perceived Usefulness), PEASE (Perceived Ease of Use), ATTIT (Attitude toward using Moodle), INTENT (Continuance Intention); 2. *p<.05; **p<.01; ***p<.001

As expected, the variables of “perceived usefulness,” “perceived ease-of-use,” “attitude,” “students’ perceived convenience” and “behavioral intention to the use of Moodle” were significantly correlated, shown in Table 10. The values of “perceived convenience,” “perceived usefulness,” “perceived ease of use,” and “attitude” toward using Moodle were 0.562, 0.102, 0.482, and 0.694 accordingly (all *p* values < .05).

The next step was to examine the subjects’ behavioral intention using the variables of “perceived convenience,” “perceived usefulness,” “perceived ease of use,” and “attitude.”

Table 11

The Prediction of the Acceptance of Online Discussions via Moodle

	INTENT			
PCONV	.409*			
PUSEFUL		.381*		
PEASE			.631***	
ATTIT				.750***
R^2	.177	.162	.338	.482
F-value	7.07*	7.35*	16.865***	30.656***

1. PCONV (Perceived Convenience), PUSEFUL (Perceived Usefulness), PEASE (Perceived Ease of Use), ATTIT (Attitude toward using Moodle), INTENT (Continuance Intention); 2. *p<.05; **p<.01; ***p<.001

Table 11 indicated that the regression models predict the outcome variable significantly. It means that the four variables (namely “perceived convenience,” “perceived usefulness,” “perceived ease of use,” and “attitude”) significantly influenced the subjects’ behavioral intention. The F-values of the “perceived convenience,” “perceived usefulness,” “perceived ease of use,” and “attitude” were respectively 7.07, 7.35, 16.865, and 30.656 (all *p* values < .05). Among the values, it was found that “perceived ease of use,” and “attitude” greatly influenced the subjects' behavioral intention.

Comparisons: Study 1 and Study 2

The results of the UTAUT model in the first study evidenced that the subjects significantly accepted the online discussions via Moodle, whereas the results of the UTAUT model in the second study did not. Instead, the TAM model did. The TAM model illustrated that the subjects' perceived convenience, usefulness, ease of use, and attitude, and continuance intention were the keys to success in online discussions via Moodle. Therefore, when no teachers were involved in online discussions (Study 2), the participation in online discussions became an interaction between the technological tool and the subjects even though there was college students' involvement. In this case, the model of TAM was more appropriate.

(3) Students' Pedagogical Success in English Writing

The essays in the second study were rated by only one teacher on the basis of the checklist offered by Longwood University. We believed the reliability of rating from time to time was not changing. In terms of the subjects' composition performance, the result of the Paired Samples T Test shown in Table 12 signified that there was no significant difference between the pretest and posttest in Study 2 (p > .05). Such a result was different from that of Study 1. The means of the pretest was 56.35, whereas that of the posttest was 55.94. In addition, it was found that, at the beginning, three subjects (8%) did not finish the writing assignment and five (14%) made the "copy and paste" mistake; however, eleven did not (31%). Surprisingly, the ratio of unfinished tasks and plagiarized essays stayed higher. The subjects seemed to show higher behavioral intention towards the use of the technological tool, Moodle, but they did not show their passion towards academic writing. What was worse, we found that in the first composition, the subjects did not have enough knowledge about composition such as the organization, format, and even the font, and in the last composition, most of them still did not learn it. What they wrote was not a composition, but still a kind of discussion format and content. The pretest and posttest example essays gave the demonstration.

Table 12

The Comparison of the Composition Performance between Pretest and Posttest

	Mean	SD	SE	t-value	df	sig
Pretest	56.35					
Posttest	55.94					
Pretest-Posttest	.4118	41.6225	7.14	.058	33	.954

N= 34

Examples

Pretest (First essay)

Bullies are a big problem in our social. And people do not always know they are bullying others.

Not just in campus, bulling filled in around us to every corner. I think if people really want to solve this problem, they need to learn to put their selves in other people feeling. If he or she is bullying by others, then what it feel like? When they hurting or bullying others, they should think about it, if today is bullying you, and what is the feeling?

If today you are bullying, or if you see others being bullying, you must immediately notify the teachers, because if you hide it, it will become a snowball, it will get bigger and bigger. To other people, and to the people around us, we should be united and against bullying. We can not because of fear, and do not solve the problem, just stand up and fight it, it will be solved

Posttest (Last essay)

Is money really helps teachers? I do not think so, if a teacher who really like their jobs, they will do their best.

Teachers' responsibilities are teaches studients, they need more responsibilities, not more money to do better on students testes. And if the low-performing schools really wants to elt their teachers leave, they need to promote themselves. Money can not solve all the problems. Maybe some teachers do not need more money but a better surrounding.

Comparisons: Study 1 and Study 2

Again, we compared the scores of the pretest and posttest separately between Study 1 and Study 2 using Independent Samples T-Test. Tables 13 and 14 displayed the results, showing that in the scores of the pretest, the two groups of the subjects did not perform significantly differently in pretest ($p > .5$); however, they did perform significantly differently in posttest ($p < .5$).

Looking at the detail of their first writing, we found that in the first study, not a few subjects gave up the opportunity to write, whereas in the second study, most of the students either gave up the opportunity to write or copied other words from the Internet. Regarding the last writing, the group of subjects in the first study did learn a lot from their teacher's feedback, so they made great progress not only in attitude to assignments but also in knowledge of writing. In contrast, without teacher involvement, the group of subjects in the second study seemed not to make any change. The situation was even worse. The subjects seemed not to have the ability to compare the difference between discussions and academic writing. Most of their compositions were similar to their discussions. The example compositions below showed the evidence.

Table 13

The Comparison of the First Composition Performance between Study 1 and Study 2

Pretest	N	Mean	SD	SE	t	Sig
Study1	34	51.65	37.50	6.43	-.190	.850
Study2	36	53.22	31.44	5.24		

Table 14

The Comparison of the Last Composition Performance between Study 1 and Study 2

Pretest	N	Mean	SD	SE	t	Sig
Study1	34	79.09	16.21	2.78	3.90	.00
Study2	36	52.83	35.94	5.99		

***$p < .001$

(4) Interactional Discourse, Frequency, and Word Length

Table 15 presented the overall picture of the subjects' communicative patterns in the second study, including their discussion frequency, length of words on average, and interactional discourses patterns.

First, the results of the subjects' discussion frequency displayed that the times of the subjects' participation in online discussions were on the decrease. The frequency of each discussion was 37 times, 25 times, 22 times, and 18 times accordingly. Second, although the subjects' word production in each online discussion was not long, the tendency was various, instead of declination. They were 35.12, 24.24, 29.32, and 30.74 words per time.

The interactional discourse patterns were decoded according to the Model of the Interactional Analysis (Gunawardena et al., 1997) as we did in the first study. The findings showed that, similar to the results of the first study, the discourse pattern that the subjects produced did not change a lot. The subjects mostly stayed in the first phase (Table 14). However, three responses that contained advanced communicative skill occurred. Interestingly, they did not come from the same subject. It is a good issue to explore further. The examples were shown below.

	回應: Law for Air Pollution 由 106 83614 發表於 2012 年 04 月 12 日(四.) 19:20
Ph2-1	Maybe make a law about air pollution is a current method, for poeple is always too pasive. But most important of all, we have to care about our earth and partical to do it. Only if a person would like to change, our globe would improve a lot. Protecting earth is from you and I. (55 words)

	回應: We should respect teachers 由 106 83635 發表於 2012 年 06 月 7 日(四.) 19:22
Ph4-3	When I was a child, I was dreaming to become a good teacher. But my idea is changing now. Nowaday, many studient not respect their teacher even speaking rudely to their teachir, those things make me change my idea. (39 words)

	**回應: We should be more positive preventing from bullies** 由 106 83603 發表於 2012 年 03 月 15 日(四.) 19:16
Ph2-1	**Being bullyed is not the most horrible thing, I think.** **The most important is that how you think in case that you are bullyed by someone. And whether you could geting out of this problem or not.** (37 words)

Table 15

The Results of the Online Discussions Routine via Moodle in Study 2

Types	**Discussion1**	**Discussion 2**	**Discussion 3**	**Discussion 4**
Frequency	37 times	25 times	22 times	18 times
Length of words	35.12 w/t	24.24 w/t	29.32 w/t	30.74w/t
Codes of Discourse	C1= 97% C2= 3%	C1=96% C2=4%	C1=100%	C1=95% C4=5%

N= 36

Comparisons: Study 1 and Study 2

Table 16 displayed the comparison of the subjects' communicative routine between Study 1 and Study 2. It is found that the frequency of the two groups was sharply dropped at the end of the discussions. Next, group 1 had a stable tendency in word length, whereas group 2 did not. Group 2 did not show any change in word length. However, in interactional discourse patterns, both of the groups stayed in the first level.

Table 16

The Comparison of the Interactional Analysis Model of Online Discussions via Moodle

Types		Discussion1	Discussion 2	Discussion 3	Discussion 4	Discussion 5
study1-2	**Frequency (times)**	21 37	25 25	17 22	10 18	6 φ
study1-2	**Length of words**	39.9 35.12	51.4 24.24	55.8 29.32	49.8 30.74	62.57 φ
study1-2	**Code of discourses**	C1= 75% C2=25% C1= 97% C2= 3%	C1=85% C2=15% C1=96% C2=4%	C1=62% C2=38% C1=100%	C1=72% C2=28% C1=95% C4=5%	C1=78% C2=22% φ

Study 1, N= 34; Study 2, N = 36

When comparing the results of communicative frequency, word production, and interactional discourse patterns of Study 1 and Study 2, we found that there was only a slight difference between the two studies. In the first study, the discussion frequency dropped one after another, except that of the first discussion. So did the discussion frequency of the second study (Figure 18). The interactional discourse patterns in both studies showed that the subjects used the first phase of discourses when interacting with others. Therefore, we argued that teacher involvement seemed not to act as a major factor in the aspect of communicative routine. If yes, it was only the length of words in online discussions (Figure 19).

Figure 18 The Comparison of Discussion Frequency in Study 1 and Study 2

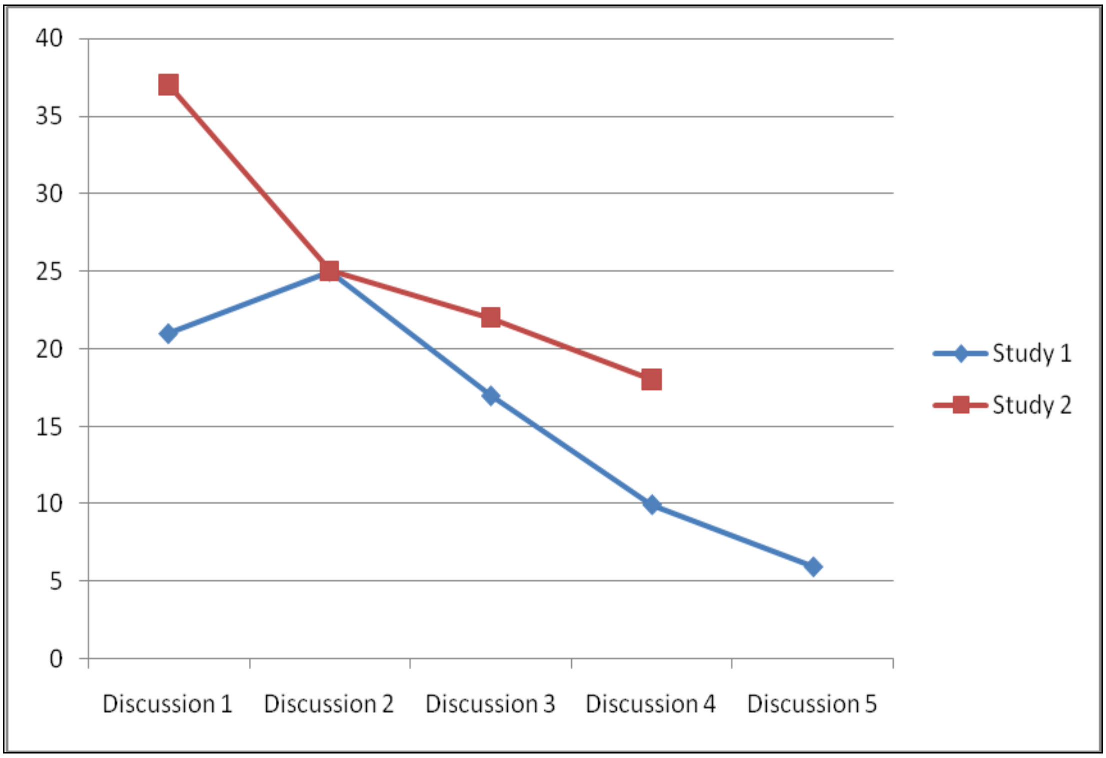
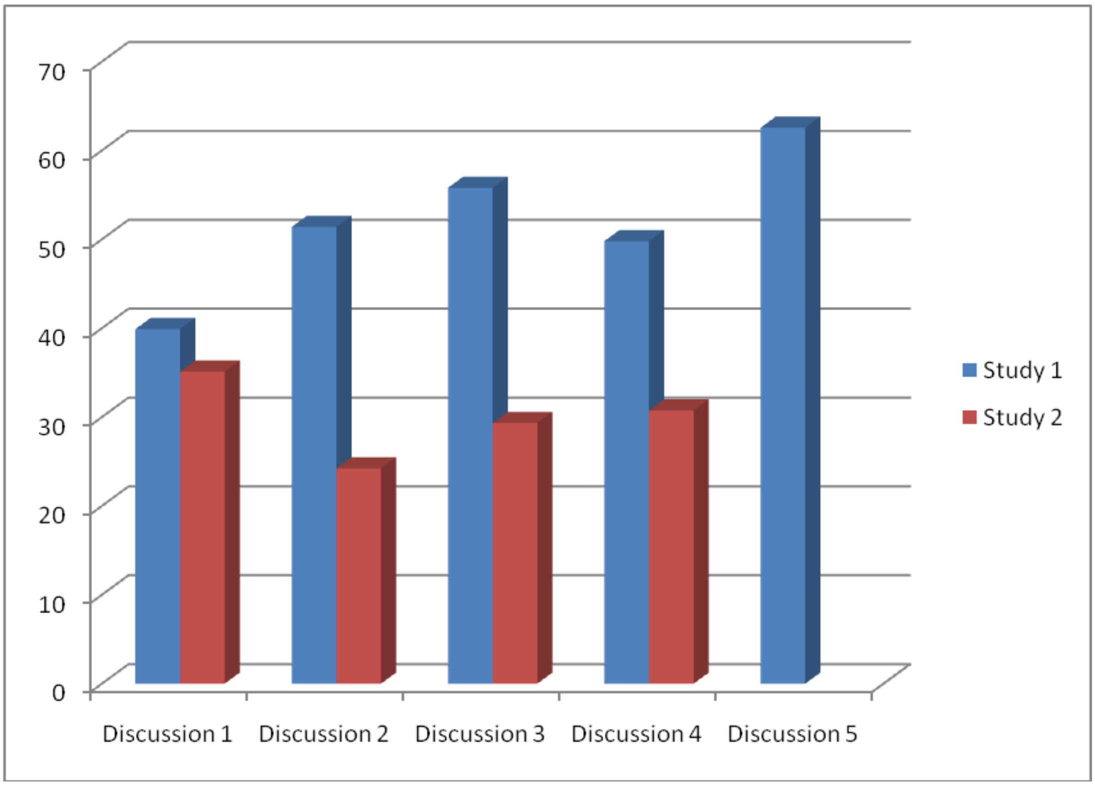


Figure 19 The Comparison of Length of Words Per Discussion in Study 1 and Study 2



4.3 Discussions

Information and communication technologies have been a trend and they are ubiquitous nowadays. They not only add convenience to everyday life but also assist in solving educational problems such as language and communication, the heart of the human. While educators are appealed to technologies, calling for more research to justify the implementation of technology in the schools, still, little or no attention has been paid in high schools (Lam, 2000). Therefore, this paper pedagogically attempts to evidence that online discussions via Moodle, a social technological tool, can benefit students and solve the problems in education. Theoretically, this paper aims to measure what made the model workable and further establish a scaffolding model for teachers who are interested in the task to follow.

Online discussions via Moodle provide vocational high school students with more opportunities of using English to interact with others and further help students develop their communicative competence as well as their English writing ability for the activity is text-based orientated. Several research questions were examined for measuring the effect of the collaborative online discussions via Moodle: (1) whether vocational high school students have the ability to conduct collaborative online discussions via Moodle, (2) whether they accept the collaborative model of online discussions, (3) whether they can achieve pedagogical success in English writing after doing collaborative online discussions, (4) what their participation frequency, time involvement, the length of word production, and interactional discourse patterns are in the collaborative online discussions via Moodle, and (5) the factor of teacher-involvement was concerned in this paper.

This paper reported the results of two studies concerning five major research domains as mentioned above. In these two studies, most of the experimental treatment procedures were the same except the role of teachers. In the first study, teachers acted as both a participant and a facilitator, whereas in the second study, there was no teacher involvement.

The Assessment of the Online Discussions via Moodle

In the first major research domain, many implications are obtained from the findings of the Assessment of the Online Discussions questionnaire. First of all, both studies presented that almost all the vocational high school students did not have problems of technical skill when using online discussions via Moodle. Such a result obviously indicated that students in Taiwan have a competent knowledge and skill of technologies. Perhaps it is because networked computers are very common in the households of Taiwan and the proportion of the population using the Internet is quite high and is growing rapidly as well (FIND, 2012). Secondly, most of the vocational high school students showed high expectation of the activity, believing that collaborative online discussions via Moodle could have a scaffolding effect and bring them a learning effect. As scholars emphasized (Herring, 1996; Murray, 1991; Rice, 1984), online discussions via Moodle can be seen as a typical electronic interaction interface that serves a similar function to face-to-face communication and benefits students' language learning. Thirdly, more than half of the students were quite adaptable for the process or application to the online discussion activity although students without teachers' assistance showed less adaption than those with teachers' help.

We concluded that online discussions via Moodle can liberate students from the constraints of time and distance (Collins & Berge, 1996) and offer students opportunities of communication and interaction (Chang, 2007, 2008; Chang & Hsu, 2008, 2010; Chang & Huang, 2009; Chao & Huang, 2007; Huang & Chang, 2009; Morris, 2005). Indeed, in the overall feedback, many students kept emphasizing two points: (1) Moodle was not only a convenient tool for students who could use it anytime anywhere; (2) Moodle also kept them free of environmental pollution by printing too much paper. The subjects even suggested that the teachers should use such an activity often. However, the teachers need to pay more attention to the capacity of computer memory. They claimed that the capacity of the Moodle storage was too small and limited, which was not easy for them to upload or download the complete currency data. For example, when they tried to upload a piece of writing with photos, they might have to wait for around 10 minutes or even longer, needless to mention uploading a video.

All in all, although students had different responses to the effect of adaption, suitability, scheduling in Study 2, more than half of the students proposed a positive attitude towards online discussions.

The Acceptance of the Online Discussions via Moodle

In terms of the students' acceptance of collaborative online discussions via Moodle, we used different models to measure the results of the two studies. The first study, which focused more on the relationship between teachers and students because of the factor of teacher-involvement, we employed the Unified Theory of Acceptance and Use of Technology (UTAUT) Model, concerning the constructs of performance expectancy, effort expectancy, social influence, facilitating conditions and the user's behavioral intention. The results showed that all these constructs were correlated and influenced one another (Venkatesh et al., 2003). The result is different from those of Wu and Chen's (2006) and Chang and Chu's (2011) studies that argue over the value of facilitating conditions. Perhaps it is because vocational high school students are not familiar with online discussions via Moodle, so the construct of facilitating conditions still plays an important role in it. In addition, the constructs of performance expectancy, effort expectancy, social influence, and facilitating conditions significantly predicated the user's behavioral intention. Therefore, we agree~~d~~ with the previous study (Marchewka, Liu, & Kostiwa, 2007), declaring that the Unified Theory of Acceptance and Use of Technology (UTAUT) model is a suitable model to account for students' behavior of using a new technology when the supervisor such as the teacher is involved in it.

In contrast, the Model of the Unified Theory of Acceptance and Use of Technology could not clarify the user's behavioral intention, but the Technology Acceptance Model (TAM) could because the second study, without teacher-involvement, put emphasis on the technology, Moodle, itself. Similar to the results of Davis (1898), Davis, Bagozzi, & Warshaw (1989) and Davis & Venkatesh (1996), the factors of perceived usefulness and perceived ease-of-use played an imperative role to predict the user's behavioral intention. Although Davis (1989) did not include the factor of attitude, but our study found that attitude and perceived convenience, proposed by Yoon and Kim (2007), were influential. That is, the factors of perceived usefulness, perceived ease-of-use, attitude, perceived convenience, and behavioral intention were correlated. Furthermore, these factors could significantly predict the user's behavioral intention. The two studies verified that different measurement models were needed for different situations; different situations required different concerns. The Unified Theory of Acceptance and Use of Technology (UTAUT) model gives depth to human relationship, whereas the Technology Acceptance Model (TAM) looks more towards technology alone. In brief, performance expectancy, effort expectancy, social influence, and facilitating conditions are more related to teacher involvement in online discussions via Moodle, whereas perceived usefulness, perceived ease-of-use, attitude, and perceived convenience are more associated with students who work alone with technology. Lastly, the results of the two studies, although they used different tools to examine students' acceptance of online discussions, both agree that students accept the new technology for its muti-functions (Ellis, 2009).

Students' Pedagogical Success in English Writing

Apart from the theoretical contributions, pedagogical success in English writing after doing collaborative online discussions is our concern as well. The activity of online discussions via Moodle is a kind of text-based interactions between and among students, contents, and interface (Berge, 1995), so it is believed that online discussions via Moodle can maximize students' constructive thinking and help students produce more in words. After all, students' continuous clarifications and responses to others in the target language can bring a great learning effect to students' writing (Nazari, 2007). In addition, initiated by Vygotsky (1978) and advocated by many researchers (Tam, 2000; Gokhale, 1995), collaboration and social interaction can help students accomplish their zone of proximal development (ZPD) and move forward to a higher level of knowledge performance.

In addition to teacher involvement in the first study, college students were invited to interact with vocational high school students as scaffolding helpers in both studies. It was hoped that the collaborative back and forth processing, promotive contact, interpersonal relationship, and mutual interdependence could help students advance their communicative competence as well as their English writing ability. The results of the two studies both demonstrated that in collaborative online discussions via Moodle, students indeed modified their ideas and enhanced their communicative competence as researchers mentioned (Chapelle, 2001, 2004, 2005; FIND, 2007; Herring, 1996) because all the students survived in the two experimental treatments.

However, not both of the collaborative online discussion cases help students in writing. We claim that possibly collaborative online discussions via Moodle advance students' communicative competence just in their critical thinking skills, but not in writing ability. Perhaps, as we assumed, such collaborative learning puts more stress on the process rather than the product, so the students do not improve their writing ability when there is no teacher's facilitation. We therefore justify the theory: a process of interaction scaffolds students with each other and gradually helps build up their knowledge (Foster & Ohta, 2005), but it cannot help students' writing ability.

There is another possible explanation. When there was no teacher involvement in online discussions, students claimed that they easily failed in keeping up with the writing schedule and some of them even considered such an activity was not suitable for them. It seems that our students still get used to negative attitude education. That is, without teachers' observation, with students' learning. Therefore, while the previous studies asserted that computer-mediated communication such as online discussions promot learners to take more responsibility for their own learning and motivated them to write for a real audience (Collins & Berge, 1996) and ZPD theories (Vygotsky, 1978) and collocative learning (Foster & Ohta, 2005; Tam, 2000) and the effects of scaffolding (Gokhale, 1995) bring the learning effect, our studies argue that without teacher involvement in online discussions, students' motivation and responsibility seemed to fade into obscurity. Perhaps if students can establish closer relationship with college students as their teachers', the result may be different.

At last, our studies want to call for the theory: teachers need to guide students step by step in their writing process. Communication either through online or offline may be helpful to students' ideas, but it is definitely not useful in writing. Hence, we need to validate that communicative language teaching approach should not just focus itself on meaning; it should also highlight the form of language and composition. Meaning and grammatical structures are equally important and so are fluency and accuracy (Liao, 2000; Rao, 1996). Expectedly, teachers in Taiwan can clarify the misconception of the communicative language teaching approach and find the balance. Online discussions via Moodle which explore students' ideas in meaning can be a good try because such discussion helps teachers get rid of the obstacles of the restricted resources and cultural limitations (Chou, 2006).

Interactional Discourse, Frequency, and Word Length

Students' participation frequency, time involvement, the length of word production, and interactional discourse patterns all show students' actual behavior in online discussions via Moodle. In both of the studies, the researchers found that students' participation frequency in online discussions was on the decrease. The reasons can be various. First, students might feel tired of communicating with others if their partners' communicative skill was inadequate and frail. Second, the topics of communications might be too serious or not fun at all. Third, too many times of discussions might bore students. Fourth, the time for discussions might not be appropriate because the last two topics in the first study and the last one in the second study were held during the period before the end of the semester; students might have too much schoolwork to cover. On the whole, no matter what reason it is, teachers need to spend effort on motivating students to persist at tasks and keeping them cognitively engaged in class discussions by either choosing appropriate, interesting materials, changing the way of the discussion such as problem-solving or showing a model of discussions.

Although teacher involvement may motivate students to produce more in communication, both of the studies indicated that students' interactional discourse patterns were inadequate and restricted, according to the Model of the Interactional Analysis (Gunawardena et al., 1997). A possible reason might be that students have only limited communicative competence. After all, this was their first try to perform online discussions via Moodle, either for students or for teachers. Therefore, it is worth conducting the follow-up studies on this aspect.

Others

Some other detailed findings are worth emphasizing. The first one is about the technology acceptance models per se. Consistent with Venkatesh et al. (2003), the four variables of the Unified Theory of Acceptance and Use of Technology (UTAUT) model were significantly correlated with one another. The result is different from Wu and Chen's (2006) and Chang & Hsu's (2010) that focused on the use and the acceptance of blogs. Although Moodle can be as easy as blogs, online discussions via Moodle can be considered to be novel for vocational high school students, so the condition of facilitation becomes important in predicting the possibility of acceptance. In any case, the factor of familiarity at this moment plays an important role in the application of information technology. As to the Technology Acceptance Model (TAM), although the measurement questionnaire of the constructs is quite reliable (Cronbach's $\alpha = .8078$), the relationship among the variables is still obscure. It seems to need a further study to clarify the relationship among the factors of perceived usefulness, perceived ease-of-use, attitude, and perceived convenience.

In the light of students' behavioral intention, the results of both the Unified Theory of Acceptance and Use of Technology (UTAUT) model and the Technology Acceptance Model (TAM) indicated that online discussions via Moodle were acceptable for high school students in general. The value of performance expectance or students' expectation of using Moodle was indeed quite high. However, we found that students' belief fluctuated (in the second study), and they had poor sense of adaption and suitability of using online discussions via Moodle in learning when there was no teacher around them. We argue that it is because students were familiar neither with online discussions nor with Moodle. Psychologists mention that people are afraid of moving into an unknown territory because our personality relies a lot on psychological structures and on associations in society or with a group of people such as family and friends. In this case, the factor of social influence becomes more important.

Feedbacks from the students and teacher further evidence the potential of the online discussions via Moodle. A very high percentage of the students agreed that Moodle was acceptable and useful for them although they felt troublesome uploading and downloading sometimes. This reminds us that to change students' passive attitude, "ease to use" and "convenience" should be emphasized more during electronic tasks.

A course/learning management system like Moodle can help learners to use self-guided service and develop their metacognitive strategies (Chang & Chu, 2011).

It also provides a community for students to share their thoughts and build knowledge. Students can work and develop closer relationship with their teacher and other schoolmates. What's more, they can review what they have done or learned in Moodle at their convenient time and space. That may be why over 50% of students, either in the first or second study, appreciated the sharing and openness features of online discussions via Moodle. On the contrary, still several of the students in the second study had a negative reaction, suggesting that teachers should put more stress on other kinds of learning, not on online discussions via Moodle. Students are used to receiving one-way lecturing and refuse to accept online discussions via Moodle even though online discussions are believed to provide students with a constructivist and collaborative environment that helps learning.

Moodle does not contain as many functions as the other course/language management systems such as Blackboard and WebCT, but it still serves teachers' need with major functions such as announcement, course information, course documents, assignments, discussion board, contact, and external links. From the result of the open-ended questionnaire, the teachers (also the researchers) gave a positive response to online discussions via Moodle. We believe that online discussions via Moodle are easy, economical, and beneficial because teachers and students who do not have subsidies or sufficient computing literacy can survive this virtual classroom. Teachers can have a whole picture of their teaching and get the historical records of students' learning process.

We admit that spending extra time and energy in management of the system at the beginning is necessary, but it is worth the effort in that the system enables teachers and students to reuse teaching/learning materials; meanwhile, it provides an instructional map that helps develop metacognition skill either for teachers or for students. Most importantly, the more the system is used, the less time and less energy it is spent. It definitely is a good idea to have online discussions via Moodle.

Lastly, we concluded that the role of teachers would not be replaced by technologies; instead, technology implementation success depends greatly on the role of teachers. Therefore, when information technologies such as online discussions via Moodle have been acknowledged worldwide as a powerful form of learning, teachers must know that vocational high school students depend greatly on them.