3. Methodology

In this paper, two studies were conducted and reported: one was teacher involvement and the other was non-teacher involvement. Although the experimental process of the two studies was almost the same, some differenes still existed including subjects and reading materials. Thus, the details were described separately.

Study 1

Subjects

In the first study, 34 third-year EFL vocational high school students, 48 EFL sophomores, and 2 English teachers participated in online discussions via Moodle, an Open Source Course/Learning Management System (C/LMS), built in Shilin High School of Commerce. The vocational high school students (i.e. male = 9; female = 25) came from a class who were English majors in the night department of a public school in Taipei. They were screened and grouped as one class in a four-year program via the High School Joint Entrance Exam. Thus, their initial English proficiency was similar. In the first two years, they received training in reading, speaking, listening, and writing skills from the same group of teachers in the same courses. These students had 9 to 11 hours of weekly in-class English input every semester, so they had many chances to practice English in class. However, far too often their teachers lectured to their students, whereas students were kept in a passive role by the lecture format and expected to absorb the content for tests and examinations. Even though the students had opportunities of discussion, teachers still did most of the talking. Although the subjects studied in the night department of the public school in Taipei, due to the pressure of schoolwork, not many of them had part-time jobs (i.e., 38%). If they did, most of them served in the convenient stores as part-time employees that spent them only a few hours of working per week.

On the other hand, 48 second-year college students were invited in the study. These students were English majors at a private university of science and technology in Taoyuan. They also had similar English background because they were screened and selected as one class by the College Joint Entrance Exam in

Taiwan. The purpose of their participation was to stimulate and scaffold these high school subjects to see whether there would be any effect on discussions. Furthermore, two English teachers were involved. They separately were not only the subjects' English teachers but also their homeroom teachers who knew their students quite well.

Materials

There were five different topics for online discussions (Appendix 4). They came from the High School English Readers materials selected jointly by the subjects' English teachers. Though these materials were designed for high school students, one thing for sure was the college students did not read them before. Moreover, according to the college teacher, each of the materials had a certain level of complexity, including structure, length, and the number of vocabulary words. The titles were as follows:

- Mona Lisa and Da Vinci (Celebrity)
- Cultural Aspects: Story Behind the Bed (History)
- Do you believe true love? (Interpersonal relationship)
- Chiufen: A Cultural Treasure of Taiwan (Culture)
- Earthship (Environmental protection)

In addition to the discussion materials, one composition checklist, two informal interview surveys and two questionnaires were administered.

The composition checklist was used as a criterion for teachers to check the subjects' essays (Appendix 3). It was adapted from Longwood University's English composition checklist in 2007. The interview surveys were about the subjects' skill in managing online discussion via Moodle. The contents included whether they had any problem using the online discussion forum via Moodle and viewing the teaching materials stored in the learning management system of Moodle. We did not do any analysis on the results of the interview surveys in the study; instead, we fixed the subjects' problems when we knew from the surveys. The only purpose was to make the experiment go on smoothly.

As to the two questionnaires, one was about the subjects' assessment of the online discussion tasks via Moodle (Appendix 1) and the other referred to the

subjects' attitude towards acceptance of online discussions (Appendix 2). It was an open-ended questionnaire, containing ten questions: whether the subjects were well adapted to the online discussion forum via Moodle, whether such a discussion forum was suitable for them, whether they encountered any technical or learning problems and how they solved them, how they expected of the activity, and most importantly, whether they had any suggestion. The other questionnaire was the UTAUT model adopted from Venkatesh et al. (2003). It contained two parts: the subjects' demographic information and 20 closed-ended question items with a 5-point Likert scale from "Least Agree =1 to Strongly Agree =5). Lastly, we used an English composition checklist designed by Longwood University in 2007 to evaluate the subjects' writing performance (Appendix 4).

Procedure

The first study served as an exploratory attempt to conceptualize a collaborative model of online discussions. In addition to diagnosis of whether vocational high school subjects have the ability to process their discussions with one another, this study examined the subjects' interactional discourse patterns in online discussions and their communicative performance in writing. This study was divided into four phases.

The first phase was a preparation stage. First of all, the Moodle interface was established (Figure 6). Next, the online course was set up (Figure 7). The teaching and learning materials including six reading articles were managed and uploaded so that college and high school subjects could retrace and read them whenever they needed for discussions. Online discussion activities and writing assignments were issued, too. Moreover, all the high school and college subjects were asked to register the online course. Since the interface of Moodle was an open software package that offered not only the function of online discussions but also that of recording and retrieving, we had to make sure it was stable in our server. Lastly, we made a video of how to Use Moodle and uploaded it there to make sure all the subjects knew how to use Moodle and start their discussion (Figure 8).

In the second phase, teachers, as usual, taught the subjects the required articles. Right after one article instruction, these subjects were asked to participate in online discussions (Figure 9). Anyone could initiate a discussion topic in the

forum. The role of the teacher was a facilitator and participant. As to college subjects, they were not invited to participate in discussions yet.

Figure 6 Establishing the Moodle Interface

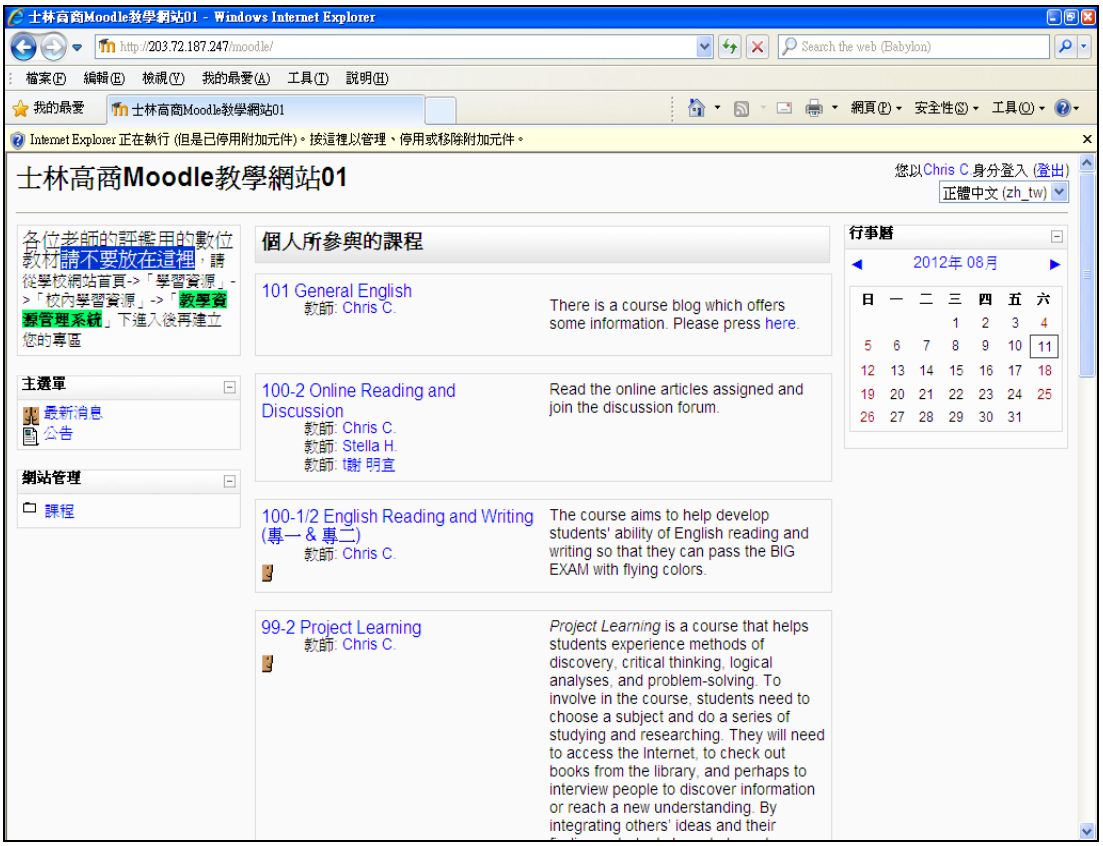


Figure 7 The Online Course

Figure 8 How to Use the Online Discussion Forum in Moodle

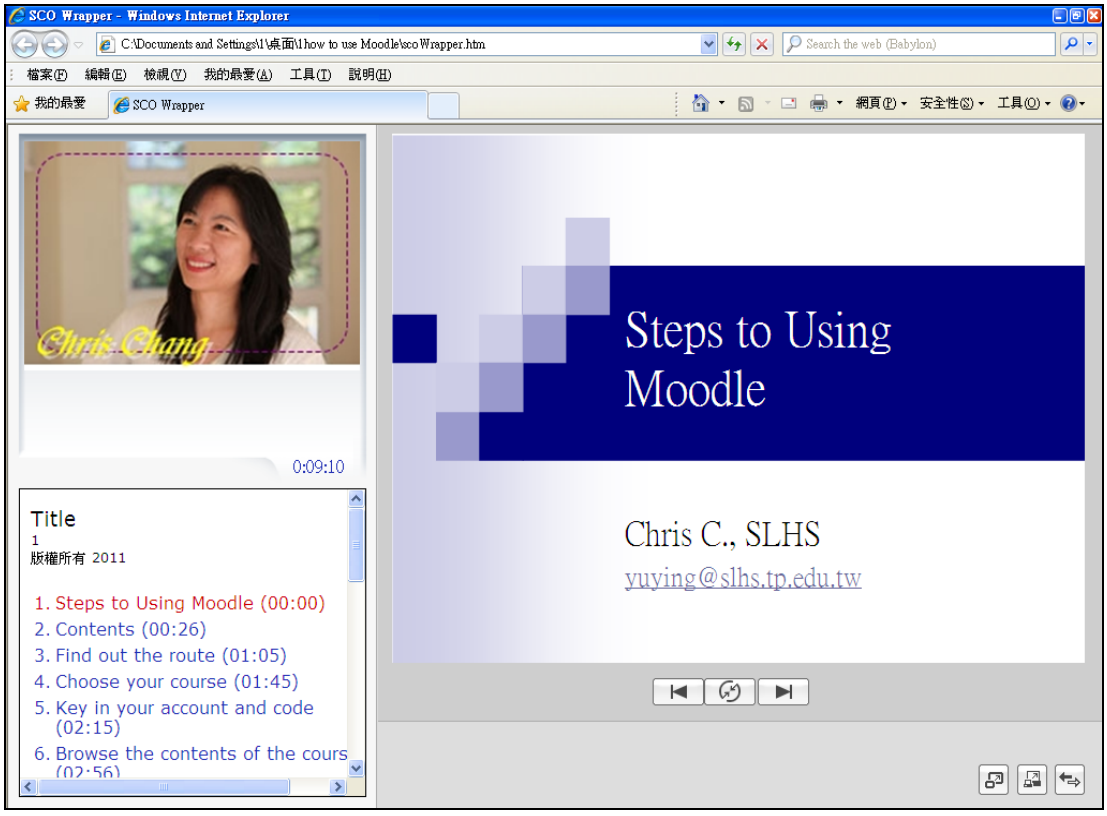


Figure 9 Online Discussions via Moodle

Figure 10 A Collaborative Online Discussions via Moodle

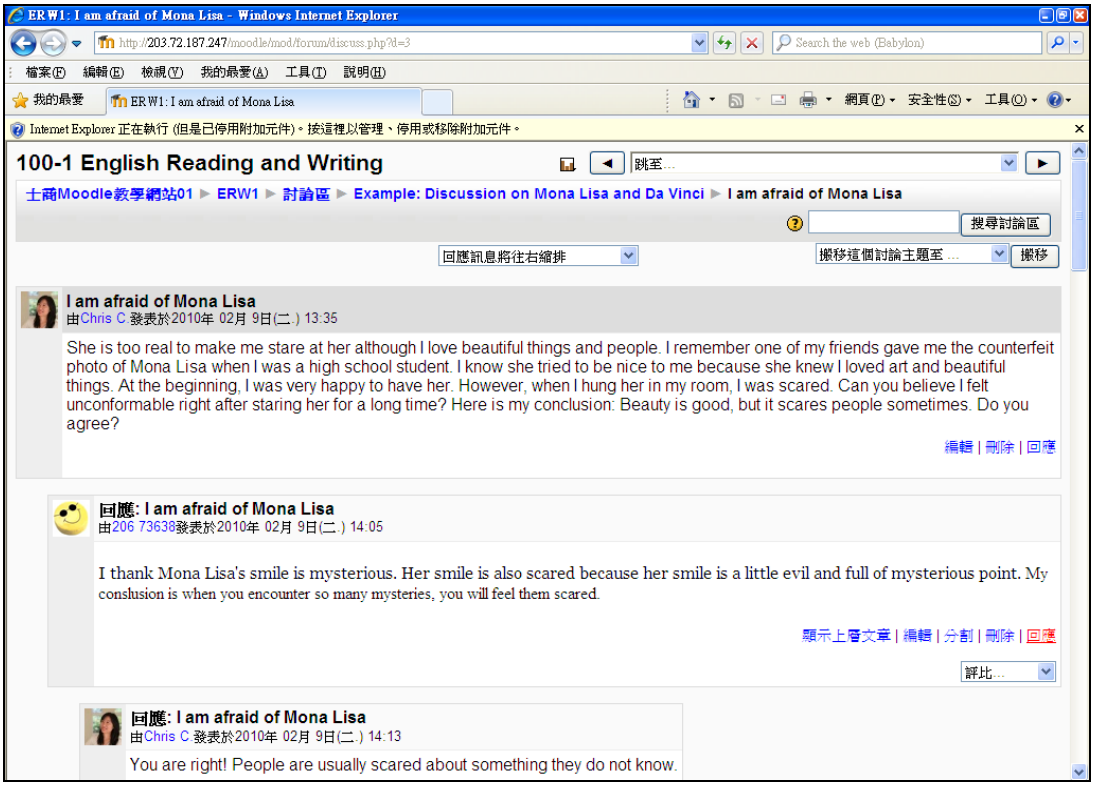


Table 3

The Procedure of Experimental Tasks

Group / Task	Process
Phase 1: preparation	Establish the Moodle interface Set up an online course Upload the teaching/learning/discussion articles Create the discussion forum in Moodle Enroll the subject list in Moodle Teach subjects how to use Moodle
Phase 2: T-HSS	T's Instruction & T-HSS Online Discussion via Moodle Do a survey interview
Phase 3: T-CS-HSS	T's Instruction & CS-HSS Online Discussion via Moodle Do a survey interview
Phase 4: T-CS -HSS	T's Instruction & HSS-HSS Online Discussion via Moodle Administer two questionnaires: Assessment of the Online Discussion Tasks via Moodle The Unified Theory of Acceptance and Use of Technology (UTAUT) Model , adopted from (Davis, 2003)

Note. HSSs = high school students; T = teachers; CSs = college students.

In the third phase, when the high school subjects were familiar with the Moodle interface, the college subjects and their teacher were invited to participate in online discussions. The college students were sorted into five groups and responsible for initiating the following discussion forums. The collaborative online discussions hence started (Figure 10). The role of the teachers was also a facilitator and participant. However, while observing the process of discussions, the teachers tried

not to be involved too much in discussions, unless the subjects were out of the focus. Right after each of the instructions, students started to discuss. That is, after the instruction of the required articles (namely *Cultural Aspects: Story Behind the Bed*, *Do you believe true love, Chiufen: A Cultural Treasure of Taiwan, and Earthship*), the subjects started to have discussions.

At the end of the study, two questionnaires, namely "Assessment of the Online Discussion Tasks via Moodle" and "The Unified Theory of Acceptance and Use of Technology (UTAUT) Model," were administered to the high school subjects, as the last phase.

To make sure the subjects knew how to manage the discussion forum via Moodle, an interview survey was conducted after each discussion. In addition, right after each discussion, the subjects were asked to write a composition about the topic they discussed. Finally, the subjects' discussion discourses were analyzed according to the IAM. The overall procedure was shown in Table 3.

Statistic Analyses

Answers to the research questions were sought by different means in this study. First, descriptive statistics was used to report the result of the Assessment of the Online Discussion Tasks via Moodle. Second, correlation and regression analyses were employed to investigate the subjects' acceptance of online discussions via Moodle. The correlation analysis examined the relationship among the four variables, whereas the regression analyses probed the subjects' behavioral intention to use Moodle, that is, acceptance attitude. Third, Paired Samples T-Test was chosen to analyze and compare the difference between the first writing (pretest) and the last one (posttest). To avoid the bias of the composition evaluation, two teachers together evaluated the subjects' compositions according to the criterion issued by Longwood University (2007). An interrater reliability analysis using the Kappa statistic was performed to determine consistency among raters. Fourth, based on the Interactional Analysis model, the subjects' online discussion discourses were decoded and patterned (Table 4). The subjects' frequency of discussion and length of the discussion content as well as their assessment of the online discussions via Moodle were reported as well.

Table 4

The Coding System of the Interaction Analysis Model (IAM)

Code Phase	Content
C1 Sharing or comparing of information about discussion topics	Statement of observation or opinion; statement of agreement between participants
C2 Discovery and exploration of dissonance or inconsistency among participants	Identifying areas of disagreement, asking, or answering questions to clarify disagreement
C3 Negotiation of meaning or co-construction of knowledge	Negotiating the meaning of terms and negotiating the relative weight to be used for various agreements
C4 Testing and modification of proposed synthesis or co-construction	Testing the proposed new knowledge against existing cognitive schema, personal experience, or other sources
C5 Agreement statement(s) or application of the newly constructed meaning	Summarizing agreements and metacognitive statements that show new knowledge construction

Study 2

To generalize the effects of the collaborative online discussion model and further promote the blended learning, the second study proceeded. However, in order to reduce a teacher's workload and the complexity, the second study invited another group of subjects with similar background using another set of reading materials, but none of the teachers was involved in it. Details of the subjects, materials, procedure, statistic analyses, results, and discussions are described respectively below.

Subjects

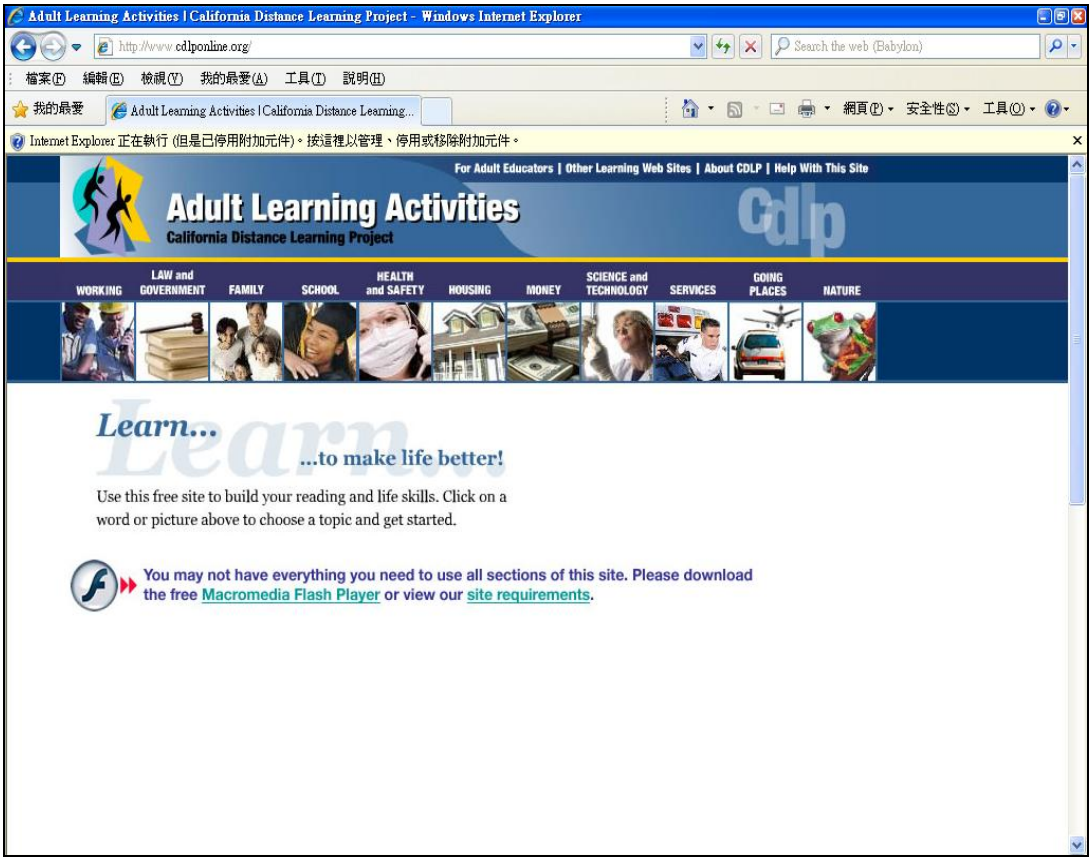
Similar to the first study, another group of 36 third-year EFL vocational high school students and 100 EFL sophomores participated in the online discussions via Moodle. All of the subjects were English majors from the same class in a night school in Taipei and a university of science and technology in Taoyuan. The high school subjects were screened by the national examination and grouped as one class, so their initial English proficiency was similar. The situation was the same as college subjects. However, different from the first study, the two English teachers were not their homeroom teachers; moreover, the teachers were not involved in their online discussions either.

Materials

Four articles related to the course content in both schools were chosen as the themes of four online discussions, shown below. These articles were selected from California Distance Learning Project (CDLP), sponsored by The California Department of Adult Education Office in The California State University System (Figure 11). The contents of CDLP were real-life stories adopted from the original stories provided by News10 KXTV Sacramento, California. It was believed that learners could know the world more and learn English at the same time. The CDLP program provided several features including online reading texts, audio files, videos, and learning activities.

- School: Schools Give Students Tools to Fight Back Against Bullies
- Nature: Burning Wood Bad for the Air
- Working: Team Player
- Money: Money Helps Teachers

Figure 11 The Website of California Distance Learning Project (CDLP)



Procedure

There were three phases in the second study. The first phase was a preparation stage. First of all, the online course was set up (Figure 12). Next, the link of the CDLP program was established, so were the links of the four reading articles. Then, the online discussion activities and writing assignments were organized and assigned to the students. Moreover, all the high school and college subjects registered the online course. Lastly, the video of how to Use Moodle made in the first study was shown in the course interface.

Figure 12 The Online Course

The second phase was processing the online discussions. In this phase, the subjects were asked to self-study the online articles and participate in online discussions every month (Figure 13). The teachers were not involved in the experimental treatment, but college subjects were invited to contribute to discussions at the beginning. Right after each discussion, the subjects were asked to write a composition about the topic they discussed. In the third phase, Assessment of the Online Discussions and UTAUT questionnaires were administered. The subjects' discussion discourses (Figure 14) were analyzed according to the IAM as well.

Figure 13 Online Discussions via Moodle

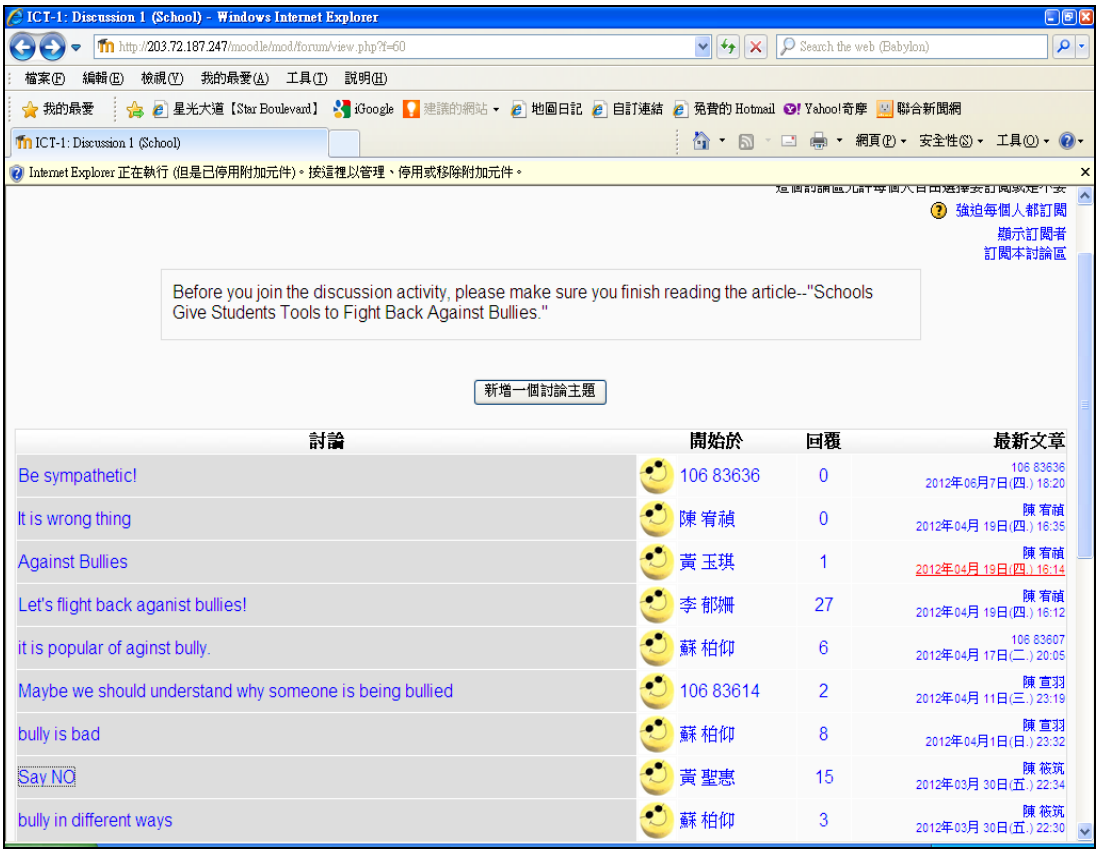


Figure 14 A Collaborative Online Discussions via Moodle

Statistics analyses

The analyses in the second study were similar to those in the first study. They were divided into four parts: (1) descriptive statistics to report the result of the Assessment of the Online Discussion Tasks via Moodle, (2) the correlation and regression analyses, based on the TAM, to understand the subjects' acceptance attitude towards the online discussions via Moodle for there was no teacher involvement, (3) the results of the Paired Samples T-Test analysis to see the subjects' performance in writing and (4) the descriptive statistical report to know the subjects' interactional discourse patterns.