Abstract

This paper reports on a project in which students from universities in Australia, China, Japan and Thailand communicated through bulletin boards and e-mail discussion lists. In total, 76 students from 5 classes participated. At the start of the project, it was intuitively felt that some kind of progression of difficulty existed in these two communication media, with bulletin boards being easier to use than discussion lists. This paper examines the discourse produced by students in both media to investigate whether these intuitive feelings were true, and to analyse the extent and types of interaction in the media.

The students' contributions in each medium were collected and provide the data for the analysis. Although 76 students contributed to the bulletin boards, the numbers dropped off for the discussion lists as term times in the four countries involved did not coincide. Because of this, I will restrict the data analysis to those students who contributed at least twice in each medium.

The data analysis examines the length of contributions, syntactic complexity of contributions, and discourse and interaction patterns. It was found that, in terms of number of words in each message, discussion lists elicited much lengthier contributions from students than bulletin boards. There was, however, no noticeable difference in syntactic complexity. Regarding cohesion between messages, students tended to link to the initial teacher messages very strongly in their contributions to the bulletin boards and less strongly in their messages to the discussion lists. Both media were typified by a one-to-many pattern of interaction whereby most student messages replied directly to the initial teacher messages and there was little student-to-student interaction.

The general lack of student-to-student direct communication in both media is a cause for concern, since it resulted in low levels of student initiation and few links following on from student contributions. Suggestions for how to solve this problem are given.

Introduction

In this paper, I will examine a term-length e-mail project in which classes from universities in four countries communicated with each other. The project involved the use of bulletin boards and e-mail discussion lists, and thus one purpose of this paper is to compare the communication, in terms of length, complexity and patterns of

interaction, of students through these two communication media. Unfortunately, in running the project, major problems of timing occurred. A second purpose of this paper, therefore, is to look at the causes of these problems and to suggest some solutions.

The situation
From October 2001 through February 2002, I taught an English language support course for undergraduate students at King Mongkut's University of Technology Thonburi (KMUTT), a well-respected Thai university. The course was primarily organised around large-scale tasks, such as a thinking task, a survey task and a task involving reporting on research (for details, see Intratat and Sojisirikul, 2001; Pichaipattanasopon, 2001; Sanguansat, 2001). In addition, there was an adjunct project (Watson Todd, 2001) running through the whole course which involved students in using bulletin boards and e-mail discussion lists to communicate with other students (see Ngonkum and Omathikul, 2001). The default version of this project was based on the use of the Intranet at the university for students to communicate with other students from different faculties within the university. The students I was teaching, however, were students on an international programme in Information Technology, and thus I felt it was worth trying to get these students communicating with students from other countries rather than from the same university. This was the starting point of the project.

In order to find other students with whom the students at KMUTT could communicate, I put a message on a discussion list for teachers of English in Asia. There were four responses from interested teachers: one from Japan, one from China, one teaching ESL students in Australia, and the last one from a higher education college in Thailand. The project was thus set up with five classes of students, and initially there were 76 students involved in the project (including 23 from the class at KMUTT).

In discussion with the other teachers, it was decided to have two parts to the project. Firstly, in November and December 2001, a class site would be set up on Nicenet (www.nicenet.org, see Abdullah, 2001 for a review of this website) to enable students to communicate with each other through bulletin boards. Secondly, in January and February 2002, students would be asked to communicate through e-mail discussion lists using Yahoo groups (groups.yahoo.com). For the bulletin boards, it was decided to set initial topics concerning how the students learnt English, but the topics for the discussion lists would be left open initially and suitable topics elicited from students at the appropriate time.

Bulletin boards and discussion lists
In the project, students were being asked to communicate with each other through the medium of computers. This is termed computer-mediated communication (CMC), which is defined as "communication that takes place between human beings via the instrumentality of computers" (Herring, 1996: 1). There are two main types of CMC: synchronous and asynchronous. Synchronous CMC is where users are communicating with each other in real time, such as using chat programs and videoconferencing. In asynchronous CMC, on the other hand, there is usually a delay in communicating, whereby one person sends a message which may be seen and replied to by another

person at any time. Both bulletin boards and discussion lists fall under the category of asynchronous CMC.

In using bulletin boards, "a message is posted in a central place to be accessed and read by many people" (Warschauer, Turbee and Roberts, 1996: 2). In most instances, the central place is a website and readers can also post a message replying to the initial message. In discussion lists, on the other hand, "one e-mail message can be sent simultaneously to thousands of e-mail addresses" (*ibid*.: 2). Because of this, there may be no central repository of messages for discussion lists, but readers can reply to messages as easily as with bulletin boards.

From the descriptions above, it can be seen that there are several similarities in the use of bulletin boards and discussion lists. According to Harrington and Levy (2001) and Warschauer (2001), both are written and textual; both involve many-to-many patterns of communication; and in both the language used is typically somewhere between the formality of most written language and the informality of spoken language.

These similarities have led to several suggested benefits of using asynchronous CMC in language teaching, irrespective of the particular format it involves. Among the advantages posited are increased student motivation (Fedderholdt, 2001; Kern, 2000; Li, 2000; Warschauer, 2001), increased meaningfulness of language use (Li, 2000), increased student confidence and responsibility (Li, 2000), student control over the content and process of learning (Dudeney, 2000; Li, 2000), the enhancement of critical thinking (Kern, 2000), and learning about both other cultures and the students' own culture (Fedderholdt, 2001; Kern, 2000).

There are, however, some key differences in the nature of bulletin boards and discussion lists. Firstly, the way messages are linked together may be different. In bulletin boards, any starter message (a term I will use to refer to the first message in any discussion thread) remains visible on the website hosting the bulletin board. There is therefore no need to link any succeeding message with this starter message in terms of content; links based on positioning of responding messages are enough. In discussion lists, on the other hand, when replying to another message, the initial message is not immediately apparent, and therefore replies may include the initial message within the reply.

Secondly, users of bulletin boards and discussion lists may feel that there is a difference in the permanence of messages. When posting a message on a bulletin board, the message is immediately visible on the website and thus may encourage a feeling of permanence about the message from the writer. With discussion lists, however, once the message has been written, clicking the 'Send' button in the e-mail program removes the message from the writer's computer screen, and thus perhaps leads to less feeling of permanence about the message.

Linked to the second difference are potential feelings of publicness about posted messages. Since bulletin board messages are visible to all on the website hosting the bulletin board, writers may feel that these messages are more publicly accessible than discussion list messages, even when the website for the bulletin board is password-protected.

Previous research into asynchronous CMC
Given the high profile of CMC within English language teaching at present, there has been surprisingly little research into this area. Three notable exceptions, however, are worth discussing.

The first is a study of e-mails between pairs of students conducted by Liaw (1998). In such e-mailing, both writing messages and reading the messages that the partner sends are needed. In this paper, however, it was found that students felt that their writing skills improved far more than their reading skills due to the e-mail exchange project.

A second useful study is that conducted by Li (2000). In this paper, e-mails were used as the medium for writing assignments. Since these writing assignments focused on different rhetorical purposes, Li investigated whether there were differences in the style of e-mail writing depending on the rhetorical purpose. The main findings were that there was a playoff between lexical complexity and grammatical accuracy in the writing, and that which one was emphasised depended on the rhetorical purpose of the writing.

The third study looks at how EFL students acculturate in their e-mail writing to being in an ESL environment (Davis and Thiede, 2000). Examining Asian students who had moved to the USA for further study, they found that these students changed the style of their e-mail writing to match that of the native speakers they were communicating with.

While these three studies are valuable and interesting, they do show the massive range of potential focuses for research into asynchronous CMC which have not yet received attention. Among these, and the focuses of this paper, are comparisons of different types of asynchronous CMC and investigations of the language of asynchronous CMC at the discourse level.

Research goals and methodology
There are two main purposes in this paper. The first is to compare the communication through bulletin boards and e-mails. This comparison will be made on several different levels. Firstly, the length of contributions (as measured by words, syntactic constituents, and T-units) in the two media will be compared. Secondly, the syntactic complexity of contributions (in terms of words/syntactic constituent, words/T-unit, and syntactic constituents/T-unit) will be compared. Next, various aspects of discourse and interaction will be investigated, including how students link messages together in the two media, the purposes of the messages, and the functions of the content included in messages.

The second main purpose of this paper emerged from the project. The dates of the semesters in Thailand (especially the semester running from November through February which is the concern of this paper) do not match those of other countries. Because of this, although the project started well with all 76 students contributing, by the end of the project the only students still contributing were those based in Thailand. This has two consequences for this paper. Firstly, it means that we must restrict the number of subjects investigated in this study. There are already a large number of variables potentially influencing the results of this study (since it was conducted naturalistically with the main goal of the project being promoting student learning). If

we include all contributions in both CMC media as data for this study, then we will lose reliability of results because of the unknown influence of different groups of students contributing to bulletin boards and e-mails. To avoid this, the data considered in this study is restricted to those 10 students who contributed most frequently in both CMC media. Secondly, the drop-off in the number of students contributing and the problems caused by this were so salient that they are worth discussing in themselves. These problems therefore become a second focus for this paper.

Sample student contributions

Before we start looking at the results of this study, it is worth giving a flavour of the messages that students contributed to both the bulletin boards and the e-mail discussion lists. The following then are a few randomly selected contributions.

For the bulletin boards, the teachers involved in the project believed it was necessary to start off the discussions with a few starter messages. A typical teacher starter message is:

> FROM: Richard Watson Todd (11/20/01 8:08 PM GMT -06:00)
> SUBJECT: How you learn in the classroom
> [Reply|Send a personal message]
> What sorts of activities do you do in the English classroom? Which ones do you find most useful? Why?

Students responded to these starter messages, and two typical responses are:

> FROM: X Y (11/22/01 12:41 AM GMT -06:00) [Send a personal message]
> SUBJECT: why learn English?
> [Edit|Delete]
> - In my class, my teacher always gives knowledge not to be serious by adapting the future life to learn easily. He sometimes brings games to help teaching but it's not nonsense. His games are about thinking skills or creative thinking by assembling us in-group. I think it's very useful because we have to participate in order to share the opinions and solve the problem together.

> FROM: A B (11/22/01 4:23 AM GMT -06:00) [Send a personal message]
> SUBJECT: Never give up.
> [Edit|Delete]
> In every English class I try to listen and speak English as much as I can. Everyday my teacher will give us new activities and I enjoyed them (the activities) very much.. I have homeworks (never less than 2) every class. Luckily, I finished them before class always.

In the discussion lists, teachers also gave starter messages based on topics chosen by the students. The following reply messages also clearly show the three questions that comprised one of the starter messages.

> Subject: [APSocialProblems] The main social problem
> Date: Sun, 6 Jan 2002 20:53:58 -0800 (PST)
> From: A B <A B@yahoo.com>
> Reply-To: APSocialProblems@yahoogroups.com
> To: APSocialProblems@yahoogroups.com
> 1. What do you think are the main social problems in your country?

- I think the main social problem in Thailand is drug.
2. Why do you think they are problems?
- Drug is the first of many problems such as a crime, a rape, a young prostitute, etc. ;
People who are addicted to drug can kill anyone when he mad, some young girls maybe
sell themselves to earn money for drug. These situation, we meet in a newspaper
everyday.
3. How do you think they can be solved?
- I think we must teach the children to know how the drug is danger. The family is the
most important. Parents must be close and look after their children carefully. They
should teach and be a good model because the children will follow their parents. Seem
the buildings are strong because their bases are firm.

Subject: [APSocialProblems] my socialproblems.
 Date: Tue, 8 Jan 2002 18:50:03 -0800 (PST)
 From: X Y
Hi friends,
Nice to meet you all.
 The social problems in my country are the problems that are about the juvenile and I
think the main problem is the drug problem that is hard to solve and it will lead to the
other problems.
 I think it is the problem because it makes the most people in trouble. The people who
use the drug cannot control themselves. They haven't conscience. They will do another
thing that may be the social problems and it will lead to another social problem.
 The government tries to solve this problem but it's very hard. I think it will solve by
their family. The parents should give love enough for them and should teach them
about the disadvantage of the drug. The special thing, the parents should be the good
consultant because they will tell you every problems and you will help them solve them
so they won't use the drug and you will know their daily life. I think it will decrease the
drug problem.
 X Y

The comparison of bulletin boards and discussion lists
The first criterion which was used to compare bulletin boards and discussion lists was
length of contributions. This was measured in three ways. Firstly, the average number
of words in the messages was counted. Secondly, the average number of syntactic
constituents was counted. In examining syntactic constituents, I am looking at the
syntactic level below the level of phrase, in other words, the level of dominant
constituent and any other constituents of a phrase (Aarts and Aarts, 1982). Thus, a
complex verb phrase, such as *try to find out*, is taken as having two constituents, the
header (*try*) and the infinitive phrase (*to find out*). Thirdly, the average number of T-
units per message was counted. Although it is more usual in analyses of written
language to investigate sentences, the T-unit, which can be defined as "an
independent conjoinable clause complex" (Fries, 1994: 229; see also Barnwell, 1998;
Ho-Peng, 1983), was used instead for two reasons. The typical linguistic
characteristics of asynchronous CMC falling somewhere between spoken and written
language suggested that using a unit restricted to analyses of written language might
not be appropriate, and some students had problems with punctuation which meant
that the division of messages into sentences by students was not always reliable. The
findings concerning length of contributions are given in Table 1.

	Bulletin boards	Discussion lists
Average number of words per message	57.59	155.64
Standard deviation for words per message	26.73	62.52

Average number of syntactic constituents per message	33.84	85.60
Standard deviation for syntactic constituents per message	15.18	31.55
Average number of T-units per message	4.84	15.44
Standard deviation for T-units per message	2.50	6.78

Table 1   Length of messages in bulletin boards and discussion lists

From Table 1, it can be seen that the discussion lists generated contributions which were roughly three times as long as the contributions to bulletin boards for all criteria. Using a T-test (2-sample unequal variance 2-tailed) to compare these results, there was a significant difference between the two CMC media in terms of length ($p < 0.00000001$). Although there are statistical problems in conducting such a comparison, the high level of significance shown suggests that there is a real difference in length of contributions between bulletin boards and discussion lists.

A second basis for comparison is syntactic complexity. Again, this can be measured in three ways: average number of words per syntactic constituent, average number of words per T-unit, and average number of syntactic constituents per T-unit. The findings are shown in Table 2.

	Bulletin boards	Discussion lists
Words per syntactic constituent	1.70	1.81
Words per T-unit	11.89	10.08
Syntactic constituents per T-unit	6.99	5.54

Table 2   Syntactic complexity in bulletin boards and discussion lists

The results here suggest great similarity between the two CMC media in terms of syntactic complexity, and a T-test shows no significant differences. We can therefore conclude that contributions in the two media are comparable for syntactic complexity.

The next criteria for comparison concern discourse and interaction. To see how messages link together, the inclusion of prompts taken from starter messages or preceding messages in reply messages can be investigated. To examine the purposes of the messages, the extent to which they reply to other messages and which other messages they reply to can be investigated. To gain insights into the functions used, certain functions typical of CMC communication, such as greetings, introductions of self or signatures, and farewells, can be identified. Finally, based on these analyses, the overall patterns of communication within each media can be seen. The findings for these are given in Table 3.

	Bulletin boards	Discussion lists
Inclusion of prompts	No inclusion	Frequent inclusion (60% of messages), primarily from the starter messages
Purposes of messages	Nearly all messages strictly answering the starter message	Most messages strictly answering the starter message
Replies to non-starter	None	Limited

messages		
Inclusion of greetings	Very rare inclusion (3% of messages)	Frequent inclusion (56% of messages)
Inclusion of introductions or signatures	No inclusion	Frequent inclusion (56% of messages)
Inclusion of farewells	Very rare inclusion (3% of messages)	Very rare inclusion (6% of messages)
Overall pattern of communication	One-to-many or many-to-one communication	One-to-many, many-to-one and many-to-many communication

Table 3   Discourse and interaction in bulletin boards and discussion lists

In many ways, Table 3 presents a depressing picture of the interaction that occurred in the project. The vast majority of messages, both in bulletin boards and in discussion lists, were replies to the starter messages posted by the teachers. Instead of stimulating student-to-student communication as had been expected, the use of CMC in this project mostly resulted in students communicating with their teachers.

Stimulating student-to-student interaction in CMC
From the findings on discourse and interaction, we have seen that there was very little student-to-student communication in this project. Since one of the pedagogic goals of the project was for students to communicate internationally with other students, this is regarded as a serious problem. In this section, I will suggest some ways in which it could be solved.

It could be argued that the problem derives from the starter questions set by the teachers. If the teachers had not set these starter questions and had not got involved in the communication, students would have been forced to communicate more directly with each other. If teachers had not contributed starter messages, on the other hand, students would have been placed in the very stressful situation of having to write the first message in each of the media. Even with the problems associated with the starter messages, I still believe that they are necessary to avoid threatening situations which may reduce students' motivation to take part in CMC. We must, therefore, look to other solutions to the problem.

One solution, which was tried out, is for the teachers to model replies to student messages in the hope that students will be encouraged to reply to student messages themselves. The effects of this approach in this project, however, were not encouraging, since although such replies to student messages led to more contributions from those students who had written the messages, they did not lead to more student-to-student interaction.

Another approach might be to require students to reply to other students or to start their own threads. Although there may be problems of forcing students to interact in such an approach (losing the potential benefit of students being in control of the process of communication), such extrinsic motivation for communicating may lead to further intrinsic motivation as the project progresses and students receive replies from other students.

One further solution is to set up the project in such a way that the project framework encourages students to interact more directly with each other. This could be done by asking students to write reports or give presentations on the content of the communication. For the discussion lists in this project, for example, students could be asked to write an assignment on the social problems in, say, Japan. To do this, they may feel that they need more information than is available from the Japanese students' replies to the starter questions and so may initiate their own elicitations of Japanese students' views of social problems. In this project, it was in fact my intention to use such an approach. The problems of students dropping out halfway through the project, however, reduced the viability of the approach to the point where I felt it would not be fair to require students to do this. This solution was therefore not possible in this project because of the timing problems between countries.

The practicalities of international CMC
Semester dates in different countries are different. For example, the dates of second semester courses in Thailand run from November to February whereas most other countries have a semester break around Christmas and New Year. This meant that students who were not from Thailand were involved in the bulletin boards but did not participate in the discussion lists, and student contributions dropped off throughout the whole project.

In setting up international CMC projects for university students, therefore, timing is a primary consideration. Where possible, semester dates in the various countries involved in a project should coincide. For countries like Thailand where this may not be possible, it may be best to find a partner organisation where teaching occurs throughout the year, or to run shorter e-mail projects which do coincide with semester dates in other countries.

Conclusions
While there were serious problems of timing and interaction in the project, students at KMUTT still rated the project very highly in an end-of-term evaluation. In spite of the problems, then, CMC projects for learners of English offer an attractive way to encourage students to express their ideas in writing while gaining other learning benefits at the same time.

To set up a CMC project, serious consideration needs to be given to timing, and the CMC medium used for the project should also be considered. From the results of this study, it is apparent that students approached the writing tasks in bulletin boards and discussion lists differently. Although these differences may be partly due to uncontrolled variables in this study, such as topics and sequence of tasks, students generally write longer contributions for discussion lists and include a greater range of language functions in discussion lists. These characteristics, in addition to the greater incidence of student-to-student communication in discussion lists, may make e-mail discussion lists a preferable medium for computer-mediated communication for learners of English.

References
Aarts, F. and Aarts, J. (1982) *English Syntactic Structures: Functions and Categories in Sentence Analysis*. Oxford/Utrecht: Pergamon Press and Bohn, Scheltema and Holkema.

Abdullah, S. A. (2001) A few simple steps towards building an online classroom with Nicenet. *IT-Links* vol. 1 no. 3. Available at: http://www.britishcouncil.org.sg/it-links/v1i3/article10.htm.

Barnwell, D. (1988) Some comments on T-unit research. *System* vol. 16 no. 2 pp. 187-192.

Davis, B. and Thiede, R. (2000) Writing into change: style shifting in asynchronous electronic discourse. In Warschauer, M. and Kern, R. (eds.) *Network-based Language Teaching: Concepts and Practice*. Cambridge: Cambridge University Press. pp. 87-120.

Dudeney, G. (2000) *The Internet and the Language Classroom: A Practical Guide for Teachers*. Cambridge: Cambridge University Press.

Fedderholdt, K. (2001) An email exchange project between non-native speakers of English. *ELT Journal* vol. 55 no. 3 pp. 273-280.

Fries, P. H. (1994) On theme, rheme and discourse goals. In Coulthard, M. (ed.) (1994) *Advances in Written Text Analysis*. London: Routledge. pp. 229-249.

Harrington, M. and Levy, M. (2001) CALL begins with a "C": interaction in computer-mediated language learning. *System* vol. 29 no. 1 pp. 15-26.

Herring, S. (1996) *Computer Mediated Communication: Linguistic, Social and Cross-Cultural Perspectives*. Amsterdam: John Benjamins.

Ho-Peng, L. (1983) Using T-unit measures to assess writing proficiency of university ESL students. *RELC Journal* vol. 14 no. 2 pp. 35-43.

Intratat, C. and Sojisirikul, S. (2001) Survey task. In Watson Todd, R. (ed.) *Task-based Learning and Curriculum Innovation*. Bangkok: KMUTT. pp. 34-40.

Kern, R. (2000) *Literacy and Language Teaching*. Oxford: Oxford University Press.

Li, Y. (2000) Linguistic characteristics of ESL writing in task-based e-mail activities. *System* vol. 28 no. 2 pp. 229-245.

Liaw, M. (1998) Using electronic mail for English as a Foreign Language instruction. *System* vol. 26 no. 3 pp. 335-351.

Ngonkum, S. and Omathikul, A. (2001) E-mail project. In Watson Todd, R. (ed.) *Task-based Learning and Curriculum Innovation*. Bangkok: KMUTT. pp. 86-96.

Pichaipattanasopon, N. (2001) The new English curriculum at KMUTT. In Watson Todd, R. (ed.) *Task-based Learning and Curriculum Innovation*. Bangkok: KMUTT. pp. 13-15.

Sanguansat, S. (2001) Thinking skills task. In Watson Todd, R. (ed.) *Task-based Learning and Curriculum Innovation*. Bangkok: KMUTT. pp. 26-33.

Warschauer, M. (2001) On-line communication. In Carter, R. and Nunan, D. (eds.) *The Cambridge Guide to Teaching English to Speakers of Other Languages*. Cambridge: Cambridge University Press. pp. 207-212.

Warschauer, M., Turbee, L. and Roberts, B. (1996) Computer learning networks and student empowerment. *System* vol. 24 no. 1 pp. 1-14.

Watson Todd, R. (2001) The use of adjunct projects in the new curriculum. In Watson Todd, R. (ed.) *Task-based Learning and Curriculum Innovation*. Bangkok: KMUTT. pp. 65-70.

The author

Richard Watson Todd is Associate Professor of Applied Linguistics at King Mongkut's University of Technology Thonburi in Thailand. He is the author of several books, including *Classroom Teaching Strategies* (Prentice Hall), and

numerous articles, including papers in *ELT Journal*, *System* and *Forum*. He plans to continue trying to implement international CMC in his teaching.