The influence of social interaction on meaning construction in a virtual community

Yu-Fen Yang, Hui-Chin Yeh and Wing-Kwong Wong

Yu-Fen Yang is an associate professor of Graduate School of Applied Foreign Languages at the National Yunlin University of Science and Technology. Hui-Chin Yeh is an assistant professor of Graduate School of Applied Foreign Languages at the National Yunlin University of Science and Technology. Wing-Kwong Wong is an associate professor of the Department of Electronic Engineering at the National Yunlin University of Science and Technology. Address for correspondence: Yu-Fen Yang, National Yunlin University of Science and Technology, 123, University Road, Section 3, Douliu, Yunlin 640, Taiwan. Email: yangyf@yuntech.edu.tw

Abstract
As proposed by social constructive theorists, meaningful learning and individual development were achieved through social interaction. To foster social interaction among students, this study formed an online learning community in which they played multiple roles as writers, editors and commentators. In playing different roles, they read peers’ texts, edited peers’ errors, evaluated peer editors’ corrections and finally reconstructed their own texts. Results of this study showed that the multiple roles they played allowed them to have opportunities to view their own texts from others’ perspectives. Based on these perspectives, they were more willing to acquire information from and contribute information to peers. All of this extensive information acquisition and contribution resulted in meaning construction of texts as active students improved their final drafts in both local revision (grammatical correction) and global revision (the style, organisation and development of a text) after receiving and evaluating feedback from peer editors. Their final drafts were very different from those of passive students whose first and final drafts were almost the same despite some grammatical revisions. This study suggests that, rather than relying only on an examination of students’ final drafts, there may be benefits in teachers encouraging students to actively participate in social interaction by reading peers’ texts, editing peers’ errors and evaluating peer editors’ corrections during text revisions.

Introduction
The term ‘learning community’ has attracted many researchers’ and educators’ attention. Wenger, McDermott and Snyder (2002) define a learning community as ‘groups of people who share a concern, a set of problems or a passion about a topic, and who
deepen their knowledge and expertise in these areas by interacting on an ongoing process’ (p. 4). McMillan and Chavis (1986) propose four components in forming a community: membership, influence, fulfilment of individual needs and shared events that create emotional connection. A sense of community often comes first from gaining access and membership of the community. Then individuals will decide who does and who does not belong to the community (ie, setting community boundaries). They will then influence each other whether to become active members in the community. During the learning process, they actively interact with the group and feel that their personal needs are being fulfilled. As time goes by, individuals experience events together, share memories and emotions with other members in the community and eventually lead to a mutual emotional bond.

In a community, meaningful learning is achieved by interaction, and people share individual resources, elicit challenging questions and provide constructive feedbacks so as to enhance personal intellectual growth (eg, Brown, Collins & Duguid, 1989; Lave and Wenger, 1991; Wenger et al, 2002). Meaningful learning is ‘active, constructive, intentional, authentic and cooperative’ (Jonassen, Peck & Wilson, 1999, pp. 11–12). That is, learning is a meaning-making process in which learners create personal views of the world, indexed by their surroundings and experiences, which is consistent with Dewey’s concepts of continuity and interaction (Dewey, 1938). Important catalysts for meaning-making are reflective comments that allow learners to make their own connections with each other. As such, an environment that fosters personal meaning-making and encourages reflective comments are considered most conducive to meaningful learning (Barab & Duffy, 2000).

Social theories of learning (eg, Vygotsky, 1978; Wenger, 1998) provide a conceptual framework of how social interaction is related to meaningful learning. Vygotsky indicates that social interaction is essential for an individual’s acquisition of knowledge. Wenger also points out that meaningful learning occurs through active participation in a community of practice. The study of Yang, Tsai, Kim, Cho and Laffey (2006) demonstrates a positive relationship between students’ academic performance and social interaction in online learning environments. In a school context, social interaction involves a community of students and teachers where they acquire and share experiences and knowledge (Liaw, Chen & Huang, 2006).

Some studies (eg, Fahy, 2007; Kuzu, 2007; Vinagre, 2008) indicate the importance of avoiding passive social interaction for online learning, such as disagreement, tension and antagonism. According to the findings of Lin, Lin and Huang’s (2008), passive social interaction includes psychological obligation and fear of criticism. Participants should not be psychologically obliged to react to the posted items. They might sometimes remain silent instead of expressing their opinions and taking the risks of being scorned. To avoid passive social interaction and enhance meaningful learning, participants have to actively engage in a common task. Working together while accomplishing a task is seen as a characteristic of powerful learning, aiming at active construction of knowledge (Van Merrienboer & Paas, 2003). Constructivism emphasises the
importance of context during the construction of knowledge and the role of social interaction in promoting learning (Doise & Mugny, 1984).

Interaction among peers is crucial in promoting meaningful learning (Francescato, Mebane, Porcelli, Attanasio & Pulino, 2007). It is seen in Chi’s (2001) study that this concept is important for college students who learn English as a Foreign Language (EFL) in Taiwan because they have few opportunities to interact with native speakers of English. To their detriment, they have few interactions with their peer learners and teachers because of very limited time in language instruction (Chi, 2001). For example, in writing class, comments for an essay are often given only once in a semester by an instructor. This means the novice writers get few benefits from writing because they have no way of knowing what corrections have been made in their writing.

Various authors (Martindale, Pearson, Curda & Pilcher, 2005; Kinnunen & Vauras, 1995; Lord and Lomicka, 2004) suggest Computer-Assisted Language Learning (CALL) instruction as an alternative to traditional face-to-face meetings or discussions in order to foster interaction between the teacher and students. CALL instruction is claimed to be time and space independent (Huffaker & Calvert, 2003; Warschauer, 1997). Teachers and students can exchange messages from different places at different times. Furthermore, the computer system can offer students clear guidance and immediate feedback after students practise some trial sessions (Sun, 2003). Students then could have scaffolding any time during the learning process as long as they request.

Background of this study

This study is set around an investigation of EFL writing classes in a university of science and technology in central Taiwan. Based on the concept of learning community and CALL instruction, an online system is built in this study for students to support each other in meaning construction of texts. In the system, students are playing multiple roles as writers, editors and commentators. Student writers are encouraged to post their texts online for their peers to read. Student editors may read and edit their peers’ texts. Then the student writers, playing commentators now, evaluate the peer editors’ suggestions and corrections. In other words, students’ roles may change when they take different actions in the online system (see Figure 1).

The purposes of this study are to investigate how an effective learning community fosters social interaction among participants and how social interaction affects participants’ meaningful learning. Meaningful learning, in this study, refers to students’ meaning construction and reconstruction of texts by interacting with their peers online. Online interaction occurs when students acquire and contribute information to each other by reading and writing. We are interested in the following aspects of the community: What are the characteristics of good writers, editors and commentators in the learning community? How do role-playing tasks promote social interaction in that community? How are texts constructed and reconstructed after peer editors’ corrections and suggestions?

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Method
Participants
A total of 46 participants were recruited from two EFL writing classes in a university of science and technology in central Taiwan. These 46 participants had a common background in two aspects: (1) all of them passed the intermediate level of General English Proficiency Test, a nationwide screening test, administered by the university in order to be admitted to the English department and (2) they had taken the same writing class for 2 years in this university and were in the third year of their studies. The objective of these two writing classes was to develop students’ writing skills with online interaction. In addition to in-class instruction, students were expected to finish each text in a writing cycle (write–edit–evaluate–rewrite) within 3 weeks and spend 3–4 hours per week. They were randomly assigned a number in the system in order to be anonymous to post their reaction essays, edit peers’ writing errors, evaluate peer editors’ corrections and finally reconstruct their texts.

System development
The online system mainly includes two modules: the student interface and the teacher interface. The relationships between these two modules are shown in Figure 2.

The student interface
Through the student interface, three kinds of members participate in the learning community; they are writers, editors and commentators. Writers can click a ‘publish’ button on the screen to post a new essay. Detailed information such as date, number of
clicks (e.g., the times of reading peer writers’ texts, editing peers’ errors and evaluating peer editors’ suggestions and corrections) and number of versions of a text is also shown in the interface. An editor can click on any title of an essay to read and he or she is encouraged to use the following function keys in the interface (Figure 3).

(A) Suggest global revision: Two types of revisions are identified (Cho & Schunn, 2007; Li, 2006): local and global revisions. Local revision, in this study, refers to student writers’ corrections on grammatical errors such as redundant words, misuse of punctuations and subject–verb agreement. Global revision refers to writers’ corrections on the organisation, development and style of a text. Both local and global revisions are important for students to improve their texts. When peer editors detect inconsistency of text organisation or unrelated statements in a paragraph, they may modify writers’ texts and viewpoints by clicking on the ‘response’ button on the upper left-hand side of Figure 3.

A-1. Suggestion: When the title of a text is clicked, the response messages are shown. These messages are considered as scaffoldings, which might include suggestions on the development, style and organisation of the text.

A-2. Writers’ evaluation of the suggestion: To encourage editors to offer valuable suggestions, writers can evaluate whether editors’ suggestions are useful to them. When writers evaluate peer editors’ suggestions, they are acting as commentators.

(B) Edit a text: The editor uses the ‘revise’ button to help the writer improve the quality of writing.

B-1. Comment on corrections: After grammatical corrections, the changes will be indicated in the text. The editor can select an error type for each revision and explain why the revision is made (Figure 4).
The Reflection

When I read the report “Turkish parliament authorizes incursion into Iraq”, I am sympathetic to the soldiers and Iraqis. Soldiers not only have to fight with enemies but also might lose their lives because of the government’s order. Meanwhile, people who live in Iraq may lose their families and their house may be destroyed. A lot of tragedies will come after the war. In addition, no matter who wins, he/she will lose something, such as their precious lives, families, friends, and so on. I do not really think starting a war is a wise way to solve any problem, but it is a “good” way to reduce overmuch population.
B-2. Read the comments from editors: After editors choose the error types and state the reasons, every member of the learning community is able to read the revised essay and the comments by moving the mouse on the icons in the text. These comments can help writers reflect on the errors they make.

B-3. Commentators’ evaluation for editors: The original student writers can provide comments to evaluate editors’ suggestions (see Figure 4). For example, a commentator (a student writer) might click a ‘triangle’ icon to read peer editor’s corrections or suggestions. He or she then might or might not write his or her response to each correction or suggestion. An example is shown in Figure 5. The commentator evaluated the peer editor’s correction by giving three star icons in a 5-point scale in the column of ‘Evaluation’. He or she then explained his or her evaluation in the column ‘Reasons of evaluation’.

(C) View different versions of a text: Different editors may edit the same text. After an editor publishes a revised essay, it will be saved as another version of the essay in the system. By comparing the differences, students can learn different views from their peers in the language learning community (Figure 6).

The teacher interface
In the teacher interface, a trace result is available for the teacher to monitor students’ actions on the system. There are two kinds of data in the trace result, including an action log and personal statistics.

(A) Action log: The action log records students’ every single action in the system such as reading, posting and evaluation. When students log in the system, the recording function is activated. These records are good for the teacher to monitor his students’ participations and progress in text revision. The teacher then can provide students with more explicit instruction on reading, writing, editing and evaluating texts when his or students have difficulties achieving these tasks.
View the differences between the two versions

**Article 1**

It is very terrible to bear that a man who held a rifle and shoot at a hustle and bustle department store in Nebraska. According to the report, before the man went to the mall, he left a note to his girlfriend and told her that he is going to become famous. Besides, the report said that, the shooter shoot at random and the police chief did release the name of the victims and the motivation of the shooter. It caused 9 people who were the customers died in the mall and the shooter shoot himself in the end.

**Article 2**

It is very terrible to hear that a man who held a rifle and shoot at a hustle and bustle department store in Nebraska. According to the report, before the man went to the mall, he left a note to his girlfriend and told her that he was going to become a famous person. Besides, the report said that, the shooter shoot any people at random. After this terrible affair, the police chief announce the name of the victims and the shooter’s motivation. It caused 9 people died in the mall and the shooter shoot himself at the end.

**Show Differences**

It is very terrible to bear that a man who held a rifle and shoot at a hustle and bustle department store in Nebraska. According to the report, before the man went to the mall, he left a note to his girlfriend and told her that he was going to become a famous person. Besides, the report said that, the shooter shoot any people at random. After this terrible affair, the police chief announce the name of the victims and the shooter’s motivation. It caused 9 people who were the customers died in the mall and the shooter shoot himself at the end.

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(B) **Personal statistics:** Personal statistics show the number of texts each student posts, the number and the types of errors that each student makes. Posted records include: (1) the number of new essays posted, (2) comments to peers’ essays and (3) the topics of essays that the student has revised. For example, the peer editors select the types of errors in their corrections and the number of errors in a text is automatically counted as personal statistics in the system (see Figure 7).

Personal statistics show the frequencies of each student’s grammatical errors. The statistics may raise students’ awareness to notice what skills or knowledge they lack in
writing. For example, if one frequently confuses the uses of plural and singular nouns, he or she should pay more attention to them.

**Procedures of data collection**

The present study was conducted between October 1, 2007 and January 14, 2008. A total of 46 undergraduate students were asked to post and repost their texts, which were revised by peer editors in the system in and after class. The online system recorded the participants’ actions on the system. Data collected in this study included students’ first and final drafts, action logs, personal statistics and a semi-structured interview with students. The details of data collection were as follows.

First, students’ first drafts, editors’ corrections and suggestions and students’ final texts were collected to examine the influence of social interaction on their revision of texts. Second, in order to investigate the interaction among writers, editors and commentators in the learning community, we examined the records of *trace result*: action log and personal statistics. These data also revealed how participants acquired and contributed information in social interaction.

Finally, a semi-structured interview was conducted with five participants who were randomly selected from each writing class. The interview was to examine how students perceived their roles as writers, editors and commentators and what responsibilities

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**Figure 7: Personal statistics**

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<table>
<thead>
<tr>
<th>Error Type</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single and Plural Errors</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Erroneous Part of Speech</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Redundant Words</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Collocation Errors</td>
<td>2</td>
<td>33.3</td>
</tr>
<tr>
<td>Subject-Verb Agreement Errors</td>
<td>2</td>
<td>33.3</td>
</tr>
<tr>
<td>Fragment</td>
<td>1</td>
<td>16.7</td>
</tr>
<tr>
<td>Faulty Comparison</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Punctuation Errors</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Verb Form Errors</td>
<td>1</td>
<td>16.7</td>
</tr>
</tbody>
</table>
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The article has been revised 5 times

6 errors in total

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each role should take in the learning community. The impact of editors’ suggestions towards student writers’ local and global revisions in the final drafts was also examined.

**Procedures of data analysis**

Data were analysed in terms of students’ texts, trace result and the semi-structured interview conducted in this study. First, students’ text improvement was assessed in terms of local and global revisions in their final texts comparing with original ones. Second, students’ interactions in the learning community were recorded as the trace results of action log and personal statistics. The trace results could reveal the influence of social interaction on students’ meaning construction and reconstruction of texts.

Third, the semi-structured interview was analysed by content analysis. Content analysis helped the researchers discover and describe the focus of individual, group, institutional or social attention and allowed the researcher to make inferences (Patton, 1990; Weber, 1990). Four steps of content analysis were conducted in this study: coding, categorisation, description and interpretation. Based on the interview, the researchers first coded meaningful statements from interviewees with highlights while reading through the transcriptions (coding). Next, the meaningful statements were assigned into categories with the identity of interviewees (categorisation). Then, the researchers described the statements by presenting and summarising the main ideas (description). Finally, the researchers interpreted the main ideas by offering explanation, drawing conclusions and making inferences (interpretation). The inter-rater reliabilities of students’ texts and interview protocols were 0.81 and 0.83. The disagreement between two raters was resolved by discussion. Data interpretation driven by these research methods is further explained in the following sections.

**Result**

In a learning community, reading and writing a text were examples of social interaction (Dahl, 2004). In this study, social interaction occurred when writers, editors and commentators posted their texts or comments on peers’ texts. In other words, students were free to change their roles as writers, editors and commentators as they took different actions such as reading, editing and evaluating of texts in the online system. They were also able to make choices and decisions to accept or reject peer editors’ correct and incorrect revisions. The influence of social interaction on one exemplary student, Student I, and 46 participants revising their texts is described in the following section. The results of the semi-structured interview are also presented in the section after.

**The influence of social interaction on Student I’s text**

As an example, Student I’s text was randomly selected to illustrate the influence of social interaction on students’ meaning construction of texts. Student I first constructed and posted the text on the system for his peer editors to read (Figure 8). He then read and reread his peers’ writing products and compared his first draft with others (eg, Actions #1 to #14 in Figure 8). He also took actions to correct five peer writers’ errors and provide suggestions based on the same topic ‘Patch Adams’ (eg, Actions #15, #36, #46, #55 and #67 in Figure 8). He also read and reread editors’ local and global
suggestions (e.g., Actions #30 and #31 in Figure 8). Peer editors’ corrections and suggestions are shown in Tables 1 and 2. Then he checked his first draft with editors’ corrections and suggestions. Finally, he accepted or rejected these corrections and suggestions to revise his final draft and reposted it on the system (e.g., Action #204 in Figure 8). Figure 9 shows Student I’s interaction with his peers in the acquisition and contribution of information. In constructing and reconstructing his first and final draft, Student I demonstrated his meaningful learning—meaning reconstruction of the text in social interaction with peers in the learning community (Table 3).
The influence of social interaction on community members

In the community, social interaction was found to be a reciprocal process. In the reciprocal process, students not only acquired information from but also contributed information to the community. By acquiring and contributing information, they were encouraged to perfect their texts and each of them also served as each other’s scaffold. An example is taken from Student I’s information acquisition (see Figure 10).

Among the 46 participants in this study, 36 of them (72.7%) made local revisions in their final drafts, while 10 of them (27.3%) made both local and global revisions (see Table 4). When students made only local revisions, the content of their final drafts was almost the same as the original ones. New information was hardly found from their grammatical revisions. Without transferring meaningful or new information into the

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**Table 1: An excerpt of editor’s corrections**

Carin became a beautiful butterfly and flying around Patch. I guess she was telling Patch that she was fine and didn’t worry about her. She must hope Patch can keep helping people, listening to people, connecting with people with using his own humorous way. I don’t know whether it is true or not that after people died, the soul will become a butterfly. after But, they died; nevertheless, I believe they always use different ways to show their families or friends that they are fine. ‘Patch Adams’ is full of meaning and that is why it is worth to be watched again and again.

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**Table 2: The editor’s suggestion**

This article mentioned three things that impress him most within three paragraphs. He also used these three points to illustrate his own thoughts. Therefore, I could fully understand what he wanted to say. Personally, I think he could write some introduction so that it could recall with the last sentence in the final paragraph.

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![Figure 9: Student I’s interaction with his peers](image)
Table 3: Analysis of Student I’s first and final drafts

<table>
<thead>
<tr>
<th>First draft</th>
<th>Final draft</th>
<th>Type of revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) After leaving my hometown and come to Douliou for studying, I can understand and firmly believe that home is the best shelter from all unhappiness and frustrations.</td>
<td>(1) After leaving my hometown and came to Douliou for studying, I can understand and firmly believe that home is the best shelter from all unhappiness and frustrations.</td>
<td>N/A</td>
</tr>
<tr>
<td>(2) No matter where I am and what I am doing, after all, I eventually will return to home.</td>
<td>(2) No matter where I am and what I am doing, I eventually will return to ‘home’.</td>
<td>N/A</td>
</tr>
<tr>
<td>(3) I remember there was an old man who liked to ask everyone ‘how many of the fingers?’</td>
<td>(3) I remember there was an old man who liked to ask everyone ‘how many of the fingers?’</td>
<td>N/A</td>
</tr>
<tr>
<td>(7) I don’t know it is true or not that after people died, the soul will become a butterfly.</td>
<td>(7) Although Patch was once lost the direction of life, he ultimately went back to his favorite job which is also his life goal—to help people.</td>
<td>Global revision</td>
</tr>
<tr>
<td>(8) But, I believe they always use different ways to show their families or friends that they are fine.</td>
<td>(8) Now, I am going through my life and trying to find my own way home.</td>
<td>Global revision</td>
</tr>
<tr>
<td>(9) However, I should take Patch as the model of life, that is, to see the world with a big smile.</td>
<td>(9) The movie, ‘Patch Adams’ is full of meaning and that is why it is worth to be watched again and again.</td>
<td>Global revision</td>
</tr>
<tr>
<td>(10) ‘Patch Adams’ is full of meaning and that is why it is worth to be watched again and again.</td>
<td>(10) The movie, ‘Patch Adams’ is full of meaning and that is why it is worth to be watched again and again.</td>
<td>Local revision</td>
</tr>
</tbody>
</table>

N/A, not applicable.

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Figure 10: Student I’s acquisition of information from peers
content of their final drafts, they might lose the opportunities to acquire and formulate new text structure during social interaction. Only 10 students made both local and global revisions in their final drafts. These might be due to editors’ few suggestions on student writers’ text organisation, style and development. The intervention of the teacher or experts in providing global suggestions seemed to be an important scaffold in the improvement of students’ final texts.

In Table 4, the mean frequency of students’ actions also resulted in many differences between students’ first and final drafts. A t-test was further conducted to examine whether there were significant differences in the frequency of actions between these groups of students in text revisions. The result showed that the differences were significant with \( p \) value less than 0.01. The mean frequency of students’ actions indicated that global revisions required students to take many more actions to read, post, edit and evaluate than those of students doing only local revisions. In other words, the more students interacted online, the more they did both local and global revisions in the texts.

Semi-structured interview
Ten interviewees were randomly selected from the participants in this study. They were anonymous and represented by I, II, III, to X. Questions, such as opinions about their roles in the learning community, editors’ corrections and the effectiveness of the online system were asked in the interview. From the interview, we attempted to understand their social interaction and meaning construction process in the community.

How students took their responsibilities as a good writer, editor and commentator
In the interview, the participants expressed their thoughts about the multiple roles they played in the learning community. Since they played all three roles in the community, they could view their own written texts from others’ perspectives. Based on these perspectives, they were more willing to help others as they assumed each role. With a common goal of improving their writing products, participants finally realised the responsibilities of a good writer, editor and commentator.

In the learning community, a good writer should re-examine his text before posting an essay since it represented his own ideas or conceptions. As shown in Table 5, some participants realised their responsibilities as good writers.
According to the interview, a good editor should carefully read a text and grasp the main ideas, provide meaningful corrections and explain his corrections. As shown in Table 6, in order to be a good editor, participants had to be responsible for properly correcting texts, commenting on the overall text organisation and complimenting peers on their writing. Furthermore, they thought that participants who had better language proficiency and academic achievement could serve as better editors. They also mentioned that some poor editors might suggest incorrect revisions because of misunderstanding of a text. These incorrect revisions might reduce peer writers’ motivation and frequency to evaluate poor editors’ corrections and suggestions. This passive social interaction might occur in the learning community.

In the learning community, it was important for commentators to evaluate editors’ corrections. As shown in Table 7, participants took part in social interaction by evaluating peer editors’ corrections. Social interactions occurred as a result of peer editors’ suggestions and corrections, regardless of whether the corrections were accepted or not.

How students perceived the impact of social interaction in the community

In the learning community, revisions of texts were the results of social interaction as student writers accepted or rejected peer editors’ corrections and suggestions. As shown

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**Table 5:** Participants’ perception on the role of a good writer

<table>
<thead>
<tr>
<th>Statement</th>
<th>Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>A I would check my text before posting it on the system.</td>
<td>IV, V, VI, IX</td>
</tr>
<tr>
<td>B I would revise my texts based on peers’ suggestions and corrections.</td>
<td>I, II, IV, V, VII, IX, X</td>
</tr>
<tr>
<td>C If I find errors, I would correct them and repost my texts.</td>
<td>I, III, X</td>
</tr>
</tbody>
</table>

**Table 6:** Participants’ perception on the role of a good editor

<table>
<thead>
<tr>
<th>Statement</th>
<th>Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>A As a good editor, I would notice peers’ strengths and weaknesses in writing.</td>
<td>II, IX</td>
</tr>
<tr>
<td>B As a good editor, I would add a question mark on peers’ text which I do not understand and do not know how to correct.</td>
<td>I, II, V</td>
</tr>
<tr>
<td>C As a good editor, I would compliment my classmates on their writing.</td>
<td>II, III, X</td>
</tr>
<tr>
<td>D It would be better for an editor to comment on the entire text and provide further explanations of his comment.</td>
<td>IV, V, VII</td>
</tr>
<tr>
<td>E My classmates who had good language proficiency and academic performance served as good editors.</td>
<td>I, III, IX</td>
</tr>
<tr>
<td>F Some of my classmates misunderstood my expressions in the text. The were poor editors in correcting my essays.</td>
<td>I, IV, V, VI, VII, X</td>
</tr>
<tr>
<td>G If I did not understand a sentence, I would ask the peer writer to clarify it.</td>
<td>I, III</td>
</tr>
</tbody>
</table>

Social interaction and meaning construction

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in Table 8, participants expressed how they felt the impact of social interaction on their writing process. They thought that revising one’s own texts was a more difficult task than correcting peers’ essays. Therefore, they would prefer to engage in social interaction by receiving peers’ feedbacks and to take actions to help others, rather than getting isolated in the learning community. It was also revealed that grammatical corrections were most commonly found in peer revisions. According to participants’ perceptions, revisions from both peers and teachers could improve the organisation of their texts, although they trusted the teacher’s revisions more than those of their peers. The intervention of the teacher or experts in providing global suggestions seemed to be an important scaffold in the improvement of students’ final texts.

Table 9 shows the influence of social interaction on writers, editors and commentators in the learning community. Through social interaction, writers could modify their essays, editors could develop their metacognition by reading and correcting peers’ errors, and commentators could actively evaluate peers’ corrections. These were examples of meaningful learning in the community.

How students perceived the influence of an effective learning community on social interaction and on meaningful learning

According to participants’ perceptions towards the learning community (see Table 10), appreciation and satisfaction from writers (eg. C, D and H in Table 10), editors (eg. F and G in Table 10) and commentators (eg. B and E in Table 10) towards the online system were demonstrated. The online system provided writers, editors and commentators with a common ground to revise texts and interact with each other.
From the interview, it was found that some participants were glad to acquire new information through social interaction in the learning community. Based on the new information, they were able to reconstruct their own texts and improve their writing quality.

**Discussion**

From the results of this study, we distinguished active and passive social interactions in the learning community with a conceptual framework listed in Figure 11, which shows the relationship between a learning community and social interaction and that between social interaction and meaning construction. It also presents the moderating effects, which included both active and passive interactions, on these two relationships. Factors of facilitating active social interaction, such as the teacher or experts, active participation, multiple roles and achievement of writing improvement, reinforced the positive relationships. The factor of passive social interaction was misunderstanding among the participants. When the passive factors were weak, the positive relationships became stronger.

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The effectiveness of the learning community could be evaluated by the social interaction that participants made with others. First, from different versions of texts recorded in the trace result, the improvement of essays was demonstrated by showing the process of revising a text and the influence of peers’ corrections and comments on revisions. Second, some students incorporated new organisation of texts. Whether or not a student writer accepted peers’ suggestions and corrections, every single social activity of sharing knowledge and acquiring new information would constitute meaning construction in text revision.

In the learning community, some participants expressed their gratitude in the interviews. As mentioned in the introduction section, students in the learning community shared events that created emotional connection (McMillan & Chavis, 1986). In this study, the teacher set up a common goal for students to revise their texts. If students disagreed with peer editors’ suggestions and corrections, they might raise doubts and still strived to solve the problems by looking for other references. If they agreed with peers’ suggestions, they could learn from the suggested corrections, most of which improved their texts. Furthermore, in the learning community, everyone was somebody else’s scaffold in reading and writing. From the interviews, it was found that writers, editors and commentators were willing to help peers improve their texts. The entire learning community was grateful and successfully achieved effective learning online.

In order to improve the quality of their writing, participants had an understanding of the multiple roles they played in the learning community. With empathy, writers tried hard to express their ideas clearly for editors to revise; editors tried to give clear suggestions for commentators to evaluate. As they had opportunities to play multiple roles as writers, editors and commentators in the learning community, they took the responsibilities of each role and learned about others’ perspectives. Viewing texts from others’ perspectives, they could easily understand and identify peers’ dilemmas, feelings and motives. This aroused their sense of empathy and finally led to the continuation of social interactions in the learning community.

In spite of pleasant and effective learning in the virtual community, participants still had to face some challenging tasks. Because of similar academic competence among writers, editors and commentators, sometimes they lost their opportunities to initiate social interaction. For example, editors would hesitate to revise peers’ texts because they
were not confident with their corrections. Some editors even misunderstood writers’ wordings or statements so that a few writers did not accept all of peers’ corrections. In fact, from the trace result of the system and the interviews, we found that some writers were suspicious of peers’ corrections. If editors or commentators did not understand what they read, they might not know how to give a suggestion or correction. These problems would result in less social interactions among writers, editors and commentators in the community.

To avoid passive social interaction (Figure 11) in the learning community, some solutions were suggested. First, if there were misunderstandings, student writers were encouraged to clarify their expressions for editors to review the text again. This would create more opportunities for social interaction. Second, the teacher’s facilitation could increase social interaction in the learning community (Lau, Higgins, Gelfer, Hong & Miller, 2005). According to the interviews, a few writers seemed to prefer assistance from teachers rather than from peers when they encountered difficulty in writing. It implied that the teacher or peers who had better writing skills might be the key persons to foster the ongoing interaction and provide influential support to others.

Most important of all, the teacher should take his responsibility in promoting social interaction among writers, editors and commentators and providing instruction on social skills. For instance, the teacher could make some demonstration to show how to properly interact with others; he should also encourage students to have more active social interaction in order to avoid isolation in the learning community. With the teacher’s active participation, the learning community would have fewer troubles from passive social interactions. The teacher should take the role as a mediator and counselor in shaping social behaviours in the learning community.

Acknowledgement
This study was supported by National Science Council in Republic of China, Taiwan (NSC 97-2410-H-224-016-MY2). The research grant made the continuation of this study possible.

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