A Model of Collective Dialogue Evolution toward Knowledge Sharing by Learners in a Virtual Classroom

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Abstract

Dialogue is an interactive process of conversation with the potential to improve collective learning. The literature on collective interactive learning indicates that the dialogue process contributes to behavior and creates new thinking among participants. In the virtual classroom, the dialogue process plays an important role in directing the attention of participants in e-learning systems away from content concerns and toward the interactive learning process. In this article, we define dialogue process in the virtual classroom and create a new dialogue model. We first adopt a speech-act theory to trace and describe some of the dialogue processes that underlie thinking and acting in the virtual classroom where collective action is sought. Second, we integrate the dialogue environment and model to describe each dialogue process and the important underlying mechanisms. Our findings show that the speech act in the e-learning platform is more simplified than but not contrary to the speech-act theory. Also, integrating the speech-act theory and dialogue environment makes the e-learning sharing mechanism more understandable. This study provides new insight into knowledge sharing in an e-learning platform, and provides an important basis for visual learning and knowledge sharing.

Keyword: Dialogue process, Knowledge sharing, Virtual classroom, Speech-act theory.

1. Introduction

In traditional classrooms, learners and instructors have to operate according to an arranged schedule, whereas e-learning operating in cyberspace allows more flexibility. Distant learners can ask questions, give comments, arrange work, recommend good articles, develop a project, participate in a group discussion, and browse well-recommended websites. However, the learners need to learn together by mass reading and using good communication skills in order to fully understand the materials of virtual classrooms and propose suitable issues for discussion (Hamel, 2003). In the virtual classroom, reading, posting, and discussing articles can also be considered important ways of acquiring knowledge. However, previous online teaching has focused more on designing material and improving the implement of the system rather than on analyzing learners’ behaviors.

Since the quality of communication skills plays an important role in e-learning, this study analyzed the communication processes among learners and instructors in order to elucidate the effectiveness of an e-learning platform. This study, based on speech-act theory, (1) explored how the learners’ communication process of an e-learning platform influences the formation of knowledge sharing mechanisms, and (2) analyzed whether or not an e-learning platform equipped with good communication procedures will promote peer interactive learning. Discussing interactive communication on an e-learning platform, exploring how
dialogue works, and analyzing how knowledge sharing occurs during communication can assist instructors in fully understanding different learning situations.

1.1. Dialogue
Dialogue involves the circulation of meaning, the communication process of a series of changes and reactions, and it is also an important way to achieve group thinking. Communication through dialogue can aggregate people and solve problems (Isaacs & Senge, 1992; Isaacs, 1993, 1996, 1999).

The environment of conversation contains four invisible contexts that can be separated and graded on the basis of the language behavior of self-reflection and non-self-reflection and the degree of personal and group awareness. As shown in Figure 1, the environment of conversation can be separated to four field logics (Scharmer, 2001): talking nice, talking tough, reflective, and generative. These four field logics apply to different situations of communication, and the participants can control changes between them and their growth. The first environment is talking, in which members cannot express their thinking because of unfamiliarity and the limitations due to comity. In the second environment, the content of members’ discussion is controlled, choked, or lacking in technique, and leads to the situation of talking tough. The third environment is reflective, where there is self-reflection of the conversation by members themselves or the members say to slow down. This plus the dialogue of others results in the fourth field logic, which has fecundity, and in this environment member’s opinions are constructible. The four field logics proceed in an orderly way, and each of them can move to another because of the mature ability of dialogue.

![Figure 1: Four Field Logics of Language (Scharmer, 2001)](image)

1.2. Speech-Act Theory
Austin (1962) and Searle (1979, 1992) proposed different ways to categorize how language works. Austin’s well-known five language categories are Assertives, Directives, Commissives, Expressives, and Declarations. First, an Assertive involves asserting a statement and categorizing according to facts. Basically, each discovery of each fact will lead to a definition by the decider based on different reasons. Second, Directives are operations worked by power, authority, and influence. These actions are made by elections or orders. Third, Commissives are similar to Directives, in which the speakers commit that they will finish something, which in a sense is like a declaration and announcement. Commissive behavior is not as clear and firm as promises, but instead should be considered a type of belief. It has strong relationship with directives and decisions. Fourth, Expressives are related
to social behavior and personal attitudes, and are themselves assigned to different groups: apologies, congratulations, curses, eulogia, and accusations. Fifth, Declarations are language behaviors in accordance with the reality. How we express ourselves properly is usually the expression of our position.

The analysis of speech-act theory is suitable for studying a series of abundant and dynamic learning phenomena. In this study, the micro-field-logic analysis – speech-act theory – is the methodology used to explore how the dialogue of an e-learning group is built up with words as the learning tunnel for both learners and instructors.

2. Sampling

2.1. Sample
The National Open University of Taiwan forms the basis of the domestic e-learning usage platform. The students are spread nationwide, and hence long-distance teaching has become the inevitable mode of education, with the e-learning platform becoming the most basic and widely used one. The sample used in this study came from the trial course in the master’s program of the Department of Management and Information in the National Open University. The title of this course is “Issues of Database Systems”, and it spanned an entire 18-week semester from February 2004 to June 2004. The learning methods can be divided into online and virtual face-to-face learning. The e-learning platform of the National Open University revolves around the media for e-learning, which are categorized into synchronized and asynchronized: the synchronized platform is live talking using words; and the asynchronized platform is formed with course participation, group discussion, and debates on issues. The applied technology systems employ not only virtually face-to-face discussions between instructors and learners, but also electronic-board functions that provide each virtual group with a space where they are not disturbed. The system also provides instructors with discussion times and the context of learners in BBS as a reference for grading. In order to encourage mutual learning among learners, grades are given according to individual midterm and final results, and the times of posting articles and their content.

2.2. Procedure
In the activities associated with the speech-act theory, learners understand one another and share knowledge via the model of language realization. The result of these activities is not the script material generated by learners but the experiences, professional skills, and the way they operate in the learning process. The viewpoint of this communicative language study is not only a good resource for solving a problem, it is also a useful tool for analyzing the learning process in interactive learning. Thus, this study attempted to use speech-act theory to analyze how e-learners can learn and share knowledge using words.

According to Austin’s speech-act theory, the online conversation content can be categorized into Codes 1–5 as follows: Assertives, Directives, Commissives, Expressives, and Declarations, respectively. There are two coders, both of which categorize and encode the sentences independently and synchronously according to the above-mentioned categories. The reliability of coders must be at least up to 0.9 (i.e., to ensure accordance between them). The coders must discuss parts for which there is no accordance, and reach a consensus. If this is not achieved a third person is introduced, and after further discussion the code will be decided by the most agreeable parties. This process results in the official coding.
This study employed similar data from an e-learning university. There were seven periods of training lasting seven weeks, with each consisting of twenty sentences. The reliability was 0.94, which indicates that official coding was possible. The official coding involved 1,954 sentences, of which 1,942 sentences were useful; the kappa value was 0.847, and the stability of the kappa value was 0.942. Therefore, the reliability and stability conform to the standard.

3. Results
Figure 2 shows the flow of each conversation between speaker A and listener B (note that it is not a model of the participants’ psychological statuses). The circles represent the communication status, and the arrows represent language behaviors. Each event must finish at each step and work according to the numbers in order. After the analysis and coding of data, the code of this study’s language behaviors are marked on the speech-act theory mode. The numbers in squares represent the categories they fall into after the coding of this study.

![Diagram of Basic Conversation Mode of Speech-Act Theory](image)

Figure 2: The Basic Conversation Mode of Speech-Act Theory

There are some differences between the speech-act theory mode and the speech-act theory basic mode, as described below (see Figure 3). The dynamic order in Figure 3-A is 3→1→5. The first action behavior is B’s Commissive, followed by B’s Assertive. The conversation is finished unless B is against Renege. That is to say, this development denotes that B can do a Commissive on the learning platform without A’s Request. For instance, when users of the learning platform read some discussion about SQL, Oracle, and Infomix, they actively promise to look for the answers. The learners with the same questions declare that their questions are resolved after the active learners’ postings. This shows that the ability of being active is good because they actively promise to find answers to the questions.

The dynamic order in Figure 3-B is 2→1→5. The first action behavior is A’s Request, followed by B’s Assertive. The conversation is finished after A’s Declare unless A abandons Withdraw. That is to say, this development denotes that the conversation can be finished without B’s Commissive. For example, one learner on the platform asks a question and one
provides the answer posted by another who has not been asked to do so. This is apparent in the e-learning platform, which shows that the members have a solid sense of understanding for the other members.

The dynamic order in Figure 3-C is 2→1→4. The first communication status is A’s Request, followed by B’s Assertive. The conversation is finished after A’s Expressive, which does not necessarily need A’s Declare. For example, when users of the learning platform ask questions, the others actively promise to look for the answers, which are responded to with a great deal of appreciation. In the sample, many of the conversations are finished by an Expressive, which shares the same function as a Declare.

Figure 3-D shows how emotional speech is distributed. In the speech-act dialogue model, emotional speech is distributed only in communication situations 1 and 5. As far as the dialogue environment is concerned, emotional expressions are shown only in deliberation and knowledge sharing. In the definition of dialogue theory, emotional speech leads to failure of communication, which occurs in negative scenarios such as arguing – in the four dialogue environments, emotional words appear in the stage of communication failure. However, according to the definition of speech-act theory, emotional speech belongs to emotional expressions and they do not belong to successful dialogue, such as curses and compliments. In other words, in the whole communication by speech-act theory, the expressive forces will be shown in the negotiation process between speakers and listeners. Therefore, in these online learning sampling data, the emotional expressions are not in the definition of failure, but instead are in the stages of deliberation and knowledge sharing.

**Figure 3-A:** Modification of the Basic Conversation Mode of Speech-Act Theory:
Request Without A

**Figure 3-B:** Modification of the Basic Conversation Mode of Speech-Act Theory:
Commissive Without B

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This verification of the conversation model of speech-act theory indicates that e-learning platform language behavior does not exhibit the same order as that of face-to-face language behavior. Online communication is much more simple and clearer. Although the face-to-face language behavior basic mode is not complete, which means that there are more latent behaviors, the tactic act does exist. The tactic act is the presentational of an unseen image that still influences the power of the language. For example, we do not see Promise in some online platform learners’ posting the answers, but a speech-act event is thus finished. The absence of face-to-face communication infers that the tacit understanding and the field-logic of practicing with the online platform system are highly useful.

In addition, our observations indicate that nonlanguage behavior is still important in the e-learning platform, in the same way that body language is important in face-to-face communication. For example, the uploading of files is a function of the system but is not shown in the code of the speech act in Assertive. Though it does not come with any code, the learners have read the files anyway. Here, though the conversation model of speech-act theory cannot fully describe some nonlanguage behaviors, they do still exist. That is because the e-learning platform can be considered an important assistant character in Dialogue. Thus, paying attention to the extra functions is very important, and upgrading or advancing them brings it closer to the effect of face-to-face communication for learners.

4. Conclusion
According to the dialogue model in speech-act theory, the speech-act model of online learning is not the same as that of the face-to-face model. Its development is not in the order of the speech-act basic model. Although the speech-act model in online learning seems less complete than the face-to-face speech-act model, this does not mean it is incomplete. Instead, this reflects that online communication is more concise. A completed action lacking some speech force codes indicates the existence of latent action, which may not be directly evident but is still influential. For example, some online learners post answers to some of the questions asked before promising to do so. We do not see the Commissive action, but the speech action is finished by the posting. As such, online learners must be more intuitive in finishing a speech action in the absence of some forces. Therefore, we infer that the online
learners in our sample can fully understand each other and know what they might do in the next step.

We found that the online learning platform exhibits nonlanguage behavior, such as body language in face-to-face communication. In other words, the platform provides functions that can overcome the limitations of language in face-to-face communications, such as the effect of Assertive found in the systematic function “data uploading.” Though “data uploading” cannot be found in any codes, the learners can access and read it. Here, the speech-act theory model cannot fully describe the nonliteral dialogue provided by the systems. This limitation of the speech-act theory model does not mean that nonlanguage behavior does not exist. Nonlanguage behavior can provide important assistance to an online dialogue. Thus, paying more attention to nonlanguage systematic functions can help online learners.

The main finding of this study is that the dialogue style differs between the speech-act theory and the e-learning system, in the invisible behavior. Through a modified style, we found that invisible linguistic behavior in an e-learning system is more than that in speech-act theory. Moreover, from an academic viewpoint, the study has adopted linguistic learning theory to observe and analyze the dialogue process among learners in the virtual classroom, enabling the forms of communication in an e-learning system and knowledge-sharing mechanism to be explored. In practice, the study offers certain vital constructive suggestions and references for the improvement of an e-learning system.

5. References

Because of the page limit and the quality of manuscripts, we have omitted references. Readers are welcome to send us requests for full references list by e-mail.