# Corrective Feedback in Dialogue-based Computer Assisted Language Learning

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## ABSTRACT

Computer assisted language learning (CALL) systems are used by people to learn a language. CALL systems have provided a number of advantages for language learning such as their ability to provide consistent and flexible corrective feedback during the learning process. This feedback is expressed as information about what is ungrammatical or unacceptable in a target language. This paper presents a literature study on the field of corrective feedback and CALL and describes the future plan for my PhD research.

## Categories and Subject Descriptors

I.2.7 [**Artificial Intelligence**]: Natural Language Processing—*language parsing and understanding*; H.5.2 [**Information Interfaces and Representation (HCI)**]: User Interfaces—*natural language*

## General Terms

computer assisted language learning, dialogue-based CALL

## Keywords

corrective feedback, metalinguistic, recast

## 1. INTRODUCTION

A computer assisted language learning (CALL) system is a computer application used as a tool in language teaching and learning. From the year 2000 to 2005, developed CALL systems have focused on language skills such as grammar and vocabulary learning, pronunciation, reading, writing, and listening [15]. There have been only a few systems developed for the speaking skill, which is the most crucial one to master. The reading, writing and listening skills can be mastered easily through attending classes or doing exercises. As a result, the demand for a CALL system which caters to the speaking skill has increased, especially after the introduction of on-line chatting technology. However, when using a chatting system, the presence of a tutor is vital and conversation can only be established when the tutor is available on-line. Alternatively, there is a need to develop a system

where a student can interact with a computer at any time. Such a system is called a dialogue-based CALL system. One of the main goals in any dialogue-based system is to allow the learner to train her or his communicative competence in natural, conversation-style environment.

In a normal language learning classroom, teachers usually provide positive evidence and negative evidence to learners in response to the erroneous sentences. Positive evidence consists of examples of what is grammatical or acceptable in a target language. Negative evidence, often known as corrective feedback, is information about what is ungrammatical or unacceptable in a target language.

This paper describes my proposed research to enhance a dialogue-based CALL (DB-CALL) system. Improvements will focus on corrective feedback provided by the system when dealing with a learner's erroneous input. Some background studies on corrective feedback and DB-CALL systems are explained in Section 2. Then in Section 3, I discuss some of the outstanding issues from the literature. Finally, my proposed work is outlined in Section 4.

## 2. LITERATURE REVIEW

This section starts with an introduction to corrective feedback. Then investigation studies the efficacy of corrective feedback in different language learning environments are discussed in Section 2.2.

### 2.1 Corrective Feedback

A piece of corrective feedback is a response from an addressee to a speaker, where the addressee's intention is to correct the speaker's erroneous utterance. The incorrect utterance can consist of grammatical errors, meaning errors or inappropriate use of lexical items. According to [3], corrective feedback is a response to a learner's erroneous utterance by: i) indicating where the error has occurred; ii) providing the correct structure of the erroneous utterance; or, iii) providing metalinguistic information describing the nature of the error, or any combination of these.

All corrective feedback is classified either as explicit or implicit in form [7, 3]. Explicit corrective feedback tells overtly that an error has occurred whereas implicit feedback does not. Studies identified eight different types of corrective feedback employed by language teachers [8, 10]. Table 1 shows the various types of corrective feedback.

Table 1: Various types of corrective feedback

| Corrective Feedback (Explicit Type) | Explanation |
|---|---|
| Explicit Correction | A teacher's feedback in which he/she overtly corrects a student's erroneous utterance by providing the correct form of the utterance. |
| Metalinguistic Feedback | An explanation of any errors that occurred in a student's erroneous utterance without providing the correct answer. |
| Elicitation | A teacher obtains correct forms by asking questions. |
| **Corrective Feedback (Implicit Type)** | **Explanation** |
| Recast | A teacher reformulates a student's utterance wholly or partly in a correct form. |
| Clarification Request | A teacher asks a student to rephrase the utterance. |
| Repetition | A teacher repeats a student's incorrect utterance and raises her voice to highlight the error. |
| Translation | A teacher translates a learner's native language utterance into a target language. |
| Paralinguistic Sign | A non-verbal corrective feedback such as facial expression, gesture cues, and high voice intonation |

## 2.2 Research on Corrective Feedback

Studies on corrective feedback have focused on its nature and its role in language teaching and learning [10]. This section reviews a few studies which have been conducted to investigate the effectiveness of corrective feedback in various language learning environments.

An experiment investigating the effects of recast and metalinguistic corrective feedback on the acquisition of past tense -ed was conducted in a normal classroom of language learning [3]. The participants were 34 English-as-second-language (ESL) learners and their proficiency level was lower intermediate. The participants were divided into three groups: two experimental groups and a control group. Group 1 and Group 2 completed two communicative tasks for two consecutive days. During the tasks, Group 1 received metalinguistic feedback and Group 2 received recast feedback, in response to past tense -ed errors. Table 2 (first column) shows a sample of conversation. The control group did not complete the tasks and did not receive any feedback on the errors. Testing was done in three stages: a pre-test, a post-test and a delayed test. The pre-test was conducted before the instructional tasks. The post-test and the delayed test were conducted a day and two weeks after the instructions, respectively. During the communicative tasks, Group 1 elicited more correct target forms (56% of total target forms elicited) compared to Group 2 (48%). There was a significant difference between the two groups' pre-test versus the delayed test results. Overall, the results showed Group 1 performed better than Group 2.

Using on-line chatting technology, [6] replicated the experiment done by [3]. The participants were 31 ESL elementary-level learners divided into three groups: Group 1 received metalinguistic feedback, Group 2 received recast feedback, and a control group did not participate in the chatting. Testing was done in the same three stages. The pre-test was given before the chatting, while the post-test and the delayed test were conducted a day and two weeks after the chatting respectively. Although Group 1 produced more correct target forms (52%) than Group 2 (46%), results showed no significant difference between Group 1 and Group 2 neither from the pre-test to the post-test results nor from the pre-test to the delayed test results.

One experimental study investigated which one of three types of corrective feedback (*metalinguistic, metalinguistic + elicitation*, and *repetition + elicitation*) is the most effective on learners' uptake while using a CALL system [5]. Learner's uptake means the student's response to correct his or her mistake(s). The CALL system known as E-Tutor was developed for the learners who wanted to practise various exercises on German vocabulary and grammar. The experiment was done in four stages: a pre-test, the system usage sessions, a post-test, and questionnaires. The pre-test was taken by the participants before using the system. The participants, who were university students, used the system for an entire semester (15 weeks) and completed exercises provided in each chapter. The post-test and questionnaires were given to the participants at the end of the semester. Results yielded that the participants were most likely to correct their errors (87.4%) when provided with *metalinguistic + elicitation*, compared to the provision of *metalinguistic* (86.9%) and *repetition + elicitation* (81.7%). Overall, the *metalinguistic + elicitation* is the most effective method for the learners' uptake.

Another work, was an experimental study of effective corrective feedback strategies for learning the Spanish subjunctive mood in a Web-based CALL system [4]. The author classified corrective feedback into two different groups: Giving-Answer Strategies (GAS) and Prompting-Answer Strategies (PAS). Examples of GAS are repetition and explicit correction feedback, while PAS includes metalinguistic and elicitation. The experiment was done in three stages: a pre-test, three treatment sessions, and a post-test. All participants were randomly assigned to form three groups, each consisting of 8 members. The first group received PAS feedback in response to incorrect answers and positive acknowledgment for correct answers during the treatment sessions. The second group received GAS feedback and positive acknowledgment. The third group, a control group, received only positive and negative acknowledgment during the treatment sessions. Overall results showed that the PAS group had performed better than the GAS group, and both better than the control group.

Table 2: Sample of conversation and corrective feedback

| Sample of Dialogue in [3] | Sample of Dialogue in [9] |
|---|---|
| Learner: He kiss her<br>Researcher: Kiss-you need past tense. *[metalinguistic]*<br>Learner: He kissed | SPELL: What food does Katie like?<br>Learner: Umm Katie like pizza.<br>SPELL: That's right. Katie likes pizza. *[Recast]* |
| Learner: ...they saw and they follow follow [sic] him<br>Researcher: Followed *[Recast]*<br>Learner: Followed him and attacked him. | SPELL: What drink does Katie like?<br>Learner: [Silent]<br>SPELL: What drink does Katie like? [Slower].<br>Learner: Umm-drink ...<br>SPELL: John likes red wine.*[Reformulation]*<br>What drink does Katie like? |

## 2.3  Dialogue-based CALL (DB-CALL) systems

This section describes some existing DB-CALL systems and what types of corrective feedback they provide. First and foremost, L2Tutor is a text-based dialogue system for learning English by French students [11]. It implemented keywords and scenario-based methodologies, and the scenario used is ordering meals at a restaurant. The objective of the system is to show that it can have a natural and robust conversation with a learner. The L2Tutor provides metalinguistic feedback in response to the learner's erroneous input.

The Let's Chat conversational system, developed by [14], is a DB-CALL especially for beginners or intermediate second language learners to practise their social conversations skills. There are several simple topics such as Friends, Food, Holidays and Sports which the learner may select to converse with the system. While communicating with the system, the learner is given a set of possible model responses. The developer uses this technique as an alternative to the limitations of natural language processing technology. Let's Chat implements a simple error correction. For example, the system issues a response *"That sounds odd. Perhaps you should choose again"* if a learner answers a question by selecting a response which belongs to a different topic.

Another DB-CALL system is the Spoken Electronic Language Learning (SPELL) system [9] which incorporates recent technologies such as pedagogical animated agents, speech recognition and synthesis, and a virtual environment. Types of scenarios chosen in SPELL include ordering food at a restaurant, buying tickets at a railway station, asking for directions in a town centre, and asking about a virtual agent's family. Recast feedback is provided if the learner's response is semantically correct but has some grammatical errors. The system reformulates its question if the learner has remained silent or given an incorrect response. Table 2 (second column) shows a sample conversation.

## 3.  DISCUSSION

In general, most studies have been conducted to investigate the effectiveness of corrective feedback in different language learning environments, such as normal classroom and laboratory settings. Only a few studies have been done on online text-chatting or CALL system environments. Results have shown the benefits of explicit feedback [3, 4, 5]. However, some other studies have shown that implicit feedback is better than or as effective as explicit feedback [6].

The experiment with on-line chatting [6] cannot prove that explicit corrective feedback (metalinguistic) is more efficient than implicit feedback (recast). The results show no significant difference between the two groups. The learners' proficiency level is mentioned as one of factors in why such results were produced. The proficiency level of the participants is lower than participants in [3]. However, no known experiment has been conducted to replicate [6] with more proficient participants.

Most experimental studies of effective corrective feedback strategies conducted on CALL use mixed types of corrective feedback [4, 5]. With the existence of natural language processing technology, many CALL systems implement various styles of metalinguistic feedback. As far as I am concerned, only the SPELL system [9] provides recast and reformulation as corrective feedback. However, there is no mention of any acceptance testing on such feedback. To the best of my knowledge, no experiment as similar [6, 3] has been conducted in the environment of a DB-CALL system.

Research shows that teachers prefer to provide recast (implicit feedback) as corrective feedback over other feedback types [8, 16], especially for beginners. Seedhouse [2] mentioned that explicit feedback may result in embarrassment and demotivation of the learners.

Why do language teachers in classrooms prefer to use recast? Why do CALL systems use metalinguistic feedback? Since learning language using CALL is a different environment with different modes of instruction, independent research is needed [5]. Moreover, the outcomes will likely vary. Therefore, I would like to investigate the effectiveness of recast and metalinguistic corrective feedback on a DB-CALL system, as described more in the following section.

## 4.  RESEARCH PLAN AND CONCLUSIONS

This section first explains an existing DB-CALL system which I am working on. Next my research plan is outlined.

Te Kaitito [17] is a DB-CALL system which enables text-based dialogue between a computer and a learner. The system supports multi-speaker, mixed-initiative [13], bilingual (English and Māori) and tutorial dialogue. Te Kaitito was developed using Common Lisp and the Linguistic Knowledge Building system [1] is used to parse the learner's sentence. The system supports the English Resource Grammar as the representation of English grammar and the Māori-English Grammar. Currently, in response to the learner's erroneous utterance, the system provides explicit correction (as shown in Table (3)) or simply asks the learner to respond again. My intention is to enhance Te Kaitito so that it can

**Table 3: Corrective feedback provided in Te Kaitito**

| |
|---|
| Te Kaitito: How are you? |
| Learner: I fine. |
| Te Kaitito: You mean "I **am** fine". Let's try again. |
| How are you? |
| Learner: I am fine. |

provide metalinguistic and recast feedback in response to learner's erroneous utterances. My research questions are as follows:

1. Which type of corrective feedback system leads to less errors made by students during their interaction with the system?

2. Which type of corrective feedback improves a learner's progress?

3. Does the explicit or implicit system better raise students' awareness of their errors?

4. Does the explicit or implicit system better facilitate learners in correcting their errors?

5. Does the explicit or implicit system better motivate students in language learning?

In order to answer my research questions, two versions of the Te Kaitito system will be developed. The first version provides metalinguistic feedback (System 1) and the second version provides recast feedback (System 2). Since I am focusing on an English grammar and lexicon, the system is assumed to be used by ESL learners. Three groups of participants (Group 1, Group 2, Group 3) are required and the participants will be Malaysian secondary schools pupils in form 2 (age 14). Grammatical items focused on are past tense, present tense and future tense. The content of lessons comes from a Malaysian textbook for Form 2 secondary schools [12]. All participants will be given a pre-test to determine their proficiency level. Group 1 will use System 1 and Group 2 will use System 2 respectively. During the system usage, Group 3 will do some other activities. A post-test will be given to all groups after system usage. The pre-test and post-test consist of questions on dialogues covered during the system usage session. During the experiment, the keyed interaction between the student and the system will be logged. Finally, the interaction and results from pre-test and post-test will be analysed to get the research findings.

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