Evaluating the use of feedback in dialogue systems to support remote independent online language learning

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Introduction

- Over the last two decades, there has been an increasing use of dialogue systems as language learning tools, in Computer-Assisted Language Learning (CALL) and Computer-Assisted Language Testing (CALT). However, results of such work have been mixed, leading to persistent uncertainty about how best to integrate such systems to support teacher-student interaction, much of which involves dialogue.
- A central challenge for CALL and CALT has been the nature and role of feedback.
    a) The sheer variety of interactive phenomena found in teaching and learning settings presents major modelling challenges. In particular, the role of feedback in assessment has become a key area of concern, exemplified by the notion of "formative feedback" (Ramaprasad 1983).
    b) There is a natural connection between feedback and many forms of dialogue phenomena (such as acknowledgments and clarifications), and feedback certainly has an important role to play in the use of dialogue systems for teaching and learning, although the field is still lacking a systematic approach to this.
    c) One specific group of learners for whom very little publicly available research on the impact of dialogue systems has been carried out, are remote online independent language learners. Online learning is fast becoming established as at least part of accepted language learning contexts, facilitated in large part by the internet and associated technologies. The OU is very well placed to pursue research into how to best respond to the increasing demand for remote and independent kinds of language learning.
- Our project aimed to address these three challenges.

Literature review

We conducted an extensive literature review and found:

- The task of using dialogue systems to manage delivery of feedback for the purposes of language teaching is complex and not as yet defined adequately enough for guaranteeing reliable and accurate performance from such systems.
- Such lack of progress is due to two main obstacles
    a) Despite some progress in dialogue modelling, most dialogue systems in production are still template-driven "chatbot" type systems.
    b) Current models of feedback in language are relatively rudimentary.

Instead of tackling the larger problem directly, our approach will be to: (1) develop a system that simulates interaction with an end user, such interaction being a key aspect of dialogue, while (2) modelling a suitably constrained model of feedback.

Methodology

Based on the proposals from our literature review, this initial project aims to develop infrastructure for experimental studies with subjects, including:

- Study design:
    o Data collection and modelling: Using computational tools for interactively managing feedback (i.e. building and deploying models that decide what to present to learners and how to present it).
    o Participants: 60 beginning OU students in both French and Italian (within LAL).
        ▪ Approvals now in place for Student Research Project Panel, Human Research Ethics Committee, Data Protection Impact Assessment.
- System design: In progress.
- Initial build of digital resources for running study: In planning.
- Evaluation framework: Scheduled as later work.

Progress updates

During this project, the following items of work were completed:

- Approvals in place.
- Initial data collection and modelling completed (large language models for French and Italian now completed).
- Implementation of text simplification algorithm (Complex word identification → Substitution of simplified term) in progress. Complex word identification component (using language models) nearing completion.