Chapter XIII
Evaluation of a Speech Interactive CALL System

Hazel Morton
University of Edinburgh, UK

Nancie Davidson
University of Edinburgh, UK

Mervyn Jack
University of Edinburgh, UK

ABSTRACT

This chapter describes the design of a speech interactive CALL program and its evaluation with end users. The program, SPELL (Spoken Electronic Language Learning), combines speech recognition technology, embodied animated agents and virtual worlds in creating an environment in which learners can converse with virtual characters in the target language in real-time. Empirical results are presented from an experiment which evaluated user satisfaction of using the program and interacting with the characters, and speech recognition accuracy. The results detail the limitations of the speech recogniser in this context. However, data on user satisfaction clearly show that the system was perceived by language learners as being both useful and enjoyable.

INTRODUCTION

This chapter describes the design and implementation of a speech interactive Computer Assisted Language Learning (CALL) program. A prototype has been built for two languages, Italian and Japanese, and tested with end users, who are students of the languages.

The field of CALL is an increasingly interdisciplinary one. With the increase in sophistication...
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of technology in CALL comes an increase in the sophistication of the user. The performance of a CALL program is important in an evaluation; however, it also is essential to investigate users’ attitudes towards the program as user enjoyment and engagement are crucial to its success.

User-centred design and usability studies are common in the field of Human Computer Interaction (HCI). Some researchers in the field of CALL advocate the consideration of usability issues in the design and evaluation of CALL systems (Al-lum, 2001). This chapter details the evaluation of a CALL program with usability issues taken into consideration. The purpose of the study was two-fold. Firstly, to investigate user perceptions of and attitudes towards the language learning program (the usability of the program), and their feelings towards interacting with the animated characters; secondly, to investigate the performance of the speech recognition component. Data are presented on user satisfaction using the system and on user attitudes towards interacting with the characters. User response data on the utterances made while interacting with the characters are presented. Finally, performance data are presented on the speech recognition component of the program.

THE CALL PROGRAM

When learning a target language, unless in the country in which the language is spoken, opportunities for interaction in the target language may be limited. A student studying a language in high school may receive only a few hours of language class per week and may have very limited one-on-one time with the teacher of the class. In the classroom situation, it is impossible, due to time restrictions and resources, for the teacher to engage in a spoken dialogue with every student. However, to make interaction meaningful, it is necessary that the speaker has an interlocutor with whom to interact.

In addition to resource issues, spoken language learning can be hampered by student anxiety. Feelings of embarrassment or stress when speaking in the target language may have an affect on learners’ language development and learning process. Language learners’ success can be affected by their motivation, self-confidence and anxiety. Successful language acquisition occurs when learners’ anxiety levels are low and their motivation is high. One of the perceived benefits of CALL programs is that the learners can work at their own pace, and if required in privacy. In other words, CALL programs have the ability to create an environment which may lessen the anxiety that can sometimes be present in the language learning context.

Speech is an inherently social action which requires a co-participant in the dialogue. In a CALL program, co-participants can be created for the learner as speech-enabled animated agents, which can introduce a social aspect to a language learning activity and which crucially can be a virtual interlocutor with which a learner can practice their target language (L2) speaking skills. Speech recognition technology is used to allow the learner to interact with the character who can then respond to the learner in a number of conversational turns. Through a speech enabled CALL system, oral language practice need not be restricted to limited class time. In addition, speech enabled CALL systems can also help students who feel anxious practicing their oral language skills in public (Wachowicz & Scott, 1999).

This chapter describes the evaluation of a speech enabled CALL program. The program, SPELL, combines virtual worlds and animated agents with automatic speech recognition technology to create a speech interactive CALL application in which learners can interact in the target language with the virtual characters who ‘listen’ by means of the speech recogniser. The 3D virtual worlds, created in VRML, depict the contextualized environment in which the interaction takes place.