

Development of a Recording Tool on LMS for Web-Based Language Learning and L2 Phonological Studies

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Abstract

The rapid expansion of broadband Internet access has opened up the possibilities of innovative language-related research and education, especially on speech. We have developed a tool which can be used for language-related research and education in a web-based environment. This tool is designed for recording speech data, playing it back, and uploading it onto a server. When we developed this tool, we pursued the best possible usability in recurrent operations in collecting L2 speech samples, i.e. recording and uploading the data, and in studying in e-learning environments, i.e. playing back the pre-recorded materials and recording the learners' own pronunciations. This paper gives a brief introduction of a new international research project, IPFCJ, and describes the functionality of the "PFCJ recording tool". In terms of application of this tool, the language learning materials developed under the Optimized Education Program at Tokyo University of Foreign Studies will also be reviewed. We would like to appeal to researchers interested in our research.

Index Terms: Phonological Corpus, LMS, Recording Tool, Language Learning

1. Introduction

Due to the rapid expansion of broadband Internet access, high-speed voice and video communication over a long distance has been realized. This change has made it possible to do innovative language-related research and education, especially on speech. For instance, as can be seen in the example of collecting L2 speech samples described below, it has become possible that many researchers in several different countries can now collaborate on-line to create a large accurate L2 speech corpus of learners in a rather short period of time. In the course of developing web-based language materials, we have also made it possible that learners studying in a web-based environment can record and play back their own voices with just two mouse clicks. In 2.1 below, a new international research project for creating a speech corpus of learners, called IPFCJ (Interphonologie du Français Contemporain-Japonais, or Interphonology of Contemporary French-Japanese) will be overviewed. We will then describe our recording tool which was developed to collect the speech samples for the L2 phonological corpus. This recording tool works in conjunction with Moodle, a learning management system (LMS) widely used around the world, to semiautomatically perform a set of operations of presenting information, recording utterances, gathering necessary information, and storing the data in a database. In Section 3, we will give a description of a tool for recording learners' speech, and playing back pre-recorded materials and learners'

own pronunciations. It is used in the web-based language learning environment offered under the Optimized Education Program at Tokyo University of Foreign Studies. Both of the two tools are based on the same engine, but are customized according to different intended uses. They have been developed to offer the best possible usability to users.

2. The IPFCJ project and a corpus for theoretical research and applied linguistics

The ongoing IPFCJ project is the result of a recent collaboration between the France-based PFC (Phonologie du Français Contemporain, or Phonology of Contemporary French) worldwide network and the Tokyo-based CbLLE (Corpus-based Linguistics and Language Education) team at TUFU (Tokyo University of Foreign Studies). In this section, we briefly describe the main features of the project.

The PFC project was initially a sociophonological survey, launched ten years ago by three French phonologists Jacques Durand (University of Toulouse), Bernard Laks (University of Paris Ouest), and Chantal Lyche (Universities of Oslo and Tromsø) (Durand, Laks & Lyche 2002, 2005, 2009). Their main aim was to create a large oral corpus of speech samples collected from native speakers of French, not only in France, but in all French-speaking areas (Belgium, Canada, Switzerland, Ivory Coast, Louisiana, etc.), to provide a source of sound data for descriptive and theoretical analyses on which modern French phonology could rely. Since its inception, more than sixty researchers and postgraduate students have contributed to the development of the database, which amounts now to more than 600 hours of recording (half of which is already available online). The PFC surveys, tools, dissertations, and scientific publications have been gradually gaining great recognition in the field, and all the resources are freely accessible on the website of the project (www.projet-pfc.net).

2.1. Research in L2 phonology and corpora

The PFC corpus is considered today a reference in the field of native French phonology, not only from a quantitative point of view but also from a methodological perspective, since the single protocol it relies on ensures the comparability of data and subsequent studies. In the field of L2 phonology, however, the use of a spoken corpus has been quite rare, and it is only recently that L2 phonological databases have been established in several languages such as Dutch (Neri, Cucchiari & Strik 2006), Polish (Cylwik, Wagner & Demenko 2009), English and German (Gut 2009), and English in Asia (Visceglia, Tseng, Kondo, Meng & Sagisaka 2009). In the case of L2 French, most of the existing corpora have been set up and

analyzed for morphosyntactic purposes, and none, except for ours, has been designed and used for phonetic and phonological research so far.

2.2. Speech recording tool for collecting L2 phonological corpus samples Text font

As described in 2.1, the collection of the PFC corpus data was an international collaboration work among many researchers and learners. To facilitate this project, we developed a tool called “PFCJ recording tool”. This recording tool is integrated in a learning management system (LMS), here Moodle, in the SCORM (Shareable Content Object Reference Model) format, and it enables us to record simultaneously the voices of many informants via Web browsers. The current version can operate on three different pattern tasks: (1) to pronounce a target word while seeing its spelling, (2) to repeat a target word after listening to its pronunciation, and (3) to read aloud a target written text on the screen. Each pattern corresponds to one SCO (Shareable Content Object) unit of SCORM, so that a single SCORM can contain several SCO units defined in the SCORM manifest file. In each pattern, a number of tasks are automatically presented on the screen and successively within a limited time. The recorded speech data are managed based on the profiles of informants and tasks. This management is centralized.

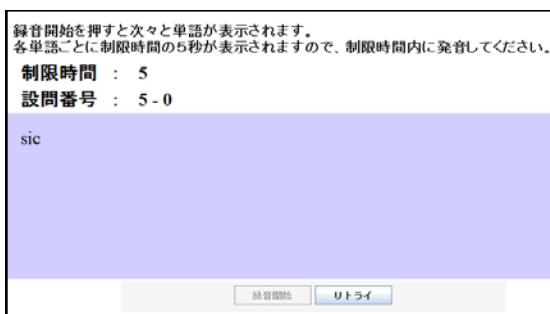


Figure 1: Pronounce a target word while seeing its spelling

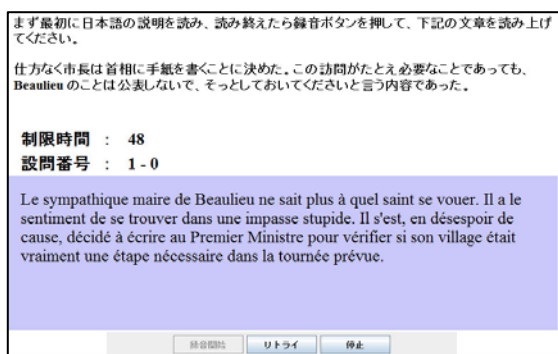


Figure 2: Read aloud a target written text

Figure 1 shows how a task in the pattern (1) is given. After the task starts, the words in a prepared list are given on the screen one after another; the informants do not need to do any operation for each word. Their speech data are automatically recorded and uploaded to a server.

Figure 2 shows how a task in the pattern (3) is given. The informants are to read aloud the texts on the screen, and their voices are recorded and stored on a server.

We have achieved the best possible usability in that only two or three mouse clicks are necessary to perform a set of operations of starting a task, presenting words and texts on the screen, recording informants’ utterances, and storing the data on a server.

3. Recording tool for language learning Discussion

The authors have developed multilingual web-based multimedia language learning materials (Lin & Kawaguchi 2007, 2009). As in the case of CAI (computer-assisted instruction), web-based learning materials can be effective on the principles of active response and immediate feedback. When the tasks are based on written characters, learners can actively response to the questions and receive immediate feedback on the correctness of their response. When the tasks are based on speech such as dialogue, however, learners have to listen to the model answers and their own, and then judge whether they are correct, since speech recognition technology cannot yet judge it correctly at present. In order to overcome this problem, we developed a recording tool available in language learning environments. This tool enables a learner to play back a pre-recorded material, record his/her own voice, playing back the pre-recorded voice again and then their own utterance so that he/she can compare their pronunciations, with just two mouse clicks. Figure 3 shows how this tool works. When clicking on the record button, the pre-recorded target sentence is played back, and the learner is to read it into a microphone (Step 0). After reading the target sentence, the learner is to click on the stop button. Then the model pronunciation is played back, and the learner’s utterance follows it, which enables him/her to compare his/her pronunciation with the model. After listening to the model and his/her own pronunciation once, he/she can listen to the pair of recordings repeatedly by clicking on the playback button (Step 2).

This two-click procedure is available not only for words and sentences, but also for role-playing tasks with multiple units of utterances.

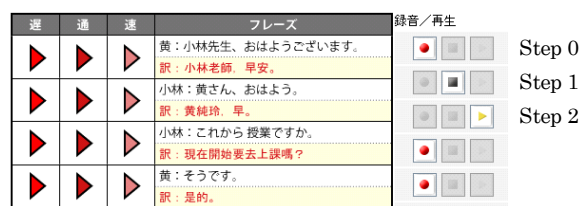


Figure 3: Recording tool for language learning

4. Closing Remarks

This paper dealt with our speech recording tool available in web-based environments. This recording tool works in conjunction with LMSs to perform a set of operations necessary both for collecting phonological corpus data, i.e. recording and uploading informants’ pronunciation data, and for language learning, i.e. recording and playing back learners’ utterances. Just one or two mouse clicks are needed for the whole procedure. We have developed this tool in hope that it will be of as much help as possible to researchers and teachers. Please contact us if you have any interest in our research.

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