A DISTANCE E-LEARNING COURSE IN PHONETICS

Michael Ashby, Jill House, Mark Huckvale, John Maidment and Kayoko Yanagisawa

Department of Phonetics and Linguistics, UCL, London, UK
{m.ashby,j.house,m.huckvale,j.maidment,k.yanagisawa}@ucl.ac.uk

ABSTRACT

This paper reports the development and evaluation of an online distance course making available most of the elements of established on-campus phonetic training within a Virtual Learning Environment (VLE). Issues associated with the use of phonetic symbols in the teaching materials and communication tools of a VLE are addressed. An outline is presented of an up-to-date, research-driven syllabus for a distance course in English phonetics with associated exercises, ear-training and assessments. An eight-week pilot of the new course attracted 25 students across five continents, indicating a healthy global market for a course of this type. Retention rate to final assessment was 64%; an evaluation questionnaire assessing satisfaction on a five-point scale (1=best) showed an average score of 1.34

Keywords: e-learning, distance learning, VLE, Unicode, English.

1. INTRODUCTION

While there have been many previous demonstrations of standalone online learning tools for phonetics [9], this project aimed to reproduce all the elements of an extended on-campus course, with tutorial material, exercises, practical training and assessment embedded in a VLE. An advantage of face-to-face phonetic training is that students work collaboratively and learn from each other. A VLE can in principle provide corresponding interactivity for distance learners — but only if it enables users to exchange the appropriate media. Existing VLEs are not well adapted even for the display of phonetic symbols on pre-prepared course pages so that they can be read by all participants regardless of computing platform and browser. The present project included the following goals:

- to research solutions within a VLE to the specific multimedia needs of distance learning in phonetics
- to design and implement a distance-learning course in English phonetics
- to pilot the course and obtain feedback

2. SYMBOLS AND SOUNDS

To maximize interactivity within the VLE, phonetic transcription is needed not only in prepared course materials, and in students' exercises and assessments, but also in spontaneous discussions, in emails – and ideally even in chat forums. The VLE employed in this project, WebCT, is typical in providing levels of font support and editing capability inadequate for the current application, and differing markedly across its various communication tools. However, institutional support for particular VLEs, and the capabilities of such software, can change rapidly. With a view to eventual transportation of output between VLEs, a general decision was made to adopt Unicode for phonetic symbol display, either in the form of HTML character references or as fonts.

2.1. Unicode

Unicode is the only logical choice for HTML handling of phonetic symbols, and is set to supplant legacy phonetic fonts in other applications too [7]. It offers the prospect of universal compatibility, but has hitherto been cumbersome to use, especially in word-processing applications. For this project a Unicode Phonetic Keyboard was developed for Windows (now distributed as a free resource), and materials were originated directly in Unicode fonts. At the same time, pages were produced guiding participants in the installation and use of Unicode fonts for their own written submissions.

With appropriate tutorial guidance, HTML also provides a general solution for participants' use of phonetic symbols within a VLE's Discussions and Mail forums – and freely available internet tools can assist the Unicode character to HTML reference conversion if required [6], [11]. As an overall fallback, and for Chat forums without HTML support, resort can be had to the all-ASCII system SAMPA [10].

2.2. Audio

Trials were carried out to define the protocols for recording format, and sampling rate, and to investigate signal-to-noise requirements, and the value of various types of postprocessing such as noise reduction and normalization. A workflow was established in which reference quality recordings were originated at 44.1 kHz in an anechoic chamber and then normalized and downsampled in batches to give 16 kHz WAV files. A comprehensive system of filenames was evolved, permitting all the textual, graphical and audio resources of the system to be clearly identified.

Ample server capacity and student satisfaction with achieved download times made it unnecessary during the pilot to compress audio files, though a range of MP3 options had been evaluated.

3. A PILOT COURSE – PHONLINE

3.1. Aims

The developments outlined will make possible a broad spectrum of online courses, spanning levels from absolute beginners to research and Continuing Professional Development for clinicians. A pilot (PHONLINE) was designed as an introductory course in English Phonetics and its aims were defined as

- ability to use and produce transcribed material in a specified variety
- knowledge and understanding of theory sufficient to underpin transcription
- competence in relevant auditory discrimination skills

3.2. Tutorial content and presentation

The design called for interactive course pages, with sound file links throughout, and integration of descriptive and acoustic approaches. Though English is well served with established descriptions [2], [3], no currently available text was entirely appropriate for the requirements of the course. Original material was therefore written in the form of eight units, of which the text runs to 28,000 words. These were converted to HTML, uploaded as draft course pages within the VLE, and systematically assessed and modified for compatibility with a range of browsers on both PC and Macintosh platforms before release. The information accumulated during these trials enabled us to add increasingly specific guidance to the "Getting Started" section of the course dealing with computer and browser settings, and to deal with individual technical problems as they arose.

Reactions from students range from those who found the course pages conventional, and would have preferred audio-visual lectures, to others who chose to print and study the units on paper. (As a backup, units were routinely made available as printable PDF files). The considerable time and resources required for the preparation of multimedia course materials need to be justified by demonstrable pedagogical advantages. We estimate that at least 500 person-hours were devoted to the authoring of the tutorial material. Screenshots of selected course pages appear as image files 1 to 3.

3.3. Syllabus

After two units (1, 2) introducing phonetic symbols and transcription, the weekly topics were (3) strong and weak vowels and stress, (4) consonant classification, (5) connected speech phenomena, (6) vowel description, accent differences and change, (7) nasality, aspiration, and coarticulation, with the final unit (8) being a brief introduction to intonation

3.3.1. Research content

By its nature, interactive online presentation encourages the inclusion of research findings. This ranged from simple examples such as newly-noted pronunciations not yet registered in available dictionaries to summaries of recently-completed studies. For instance, the treatment of vowel change in present-day RP in Unit 6 was able to use formant measurements from a project focusing on female speakers for the first time.

3.3.2. Articulatory and acoustic approaches

In contrast with familiar textbook accounts, many tutorial topics were introduced or illustrated in acoustic terms, including phrase division and linking, weak forms of function words, aspiration, and vowel quality, and the approach to intonation in Unit 8 was partly inductive, using fundamental frequency measurements on a recorded passage introduced for other purposes at the outset of the course. The traditional separation of acoustic and descriptive articulatory approaches is challenged by the ready availability of acoustic analysis tools [1], [4], which participants were encouraged to

install and use alongside this course. An indication of success came as early as week 2, when a student posting referred to spectrographic analysis applied to a problematic ear-training item. An advantage of retaining the WAV format for our own recordings was to simplify the routing of audio to such tools.

3.4. Exercises

It was in developing the exercises that the greatest obstacles were encountered from the limited functionality offered by the VLE. JavaScript was used to augment the repertoire of possible tasks, enabling such features as drag-and-drop and diagram building exercises, as well as immediate feedback in the course of a task. Example screenshots are in image files 4 to 6. All exercises were tested and progressively modified in an effort to make them run within the VLE regardless of the browser or computer platform in use.

3.4.1. Ear-training

Each batch of exercises concludes with ear-training practice, which presents recorded material which must be transcribed. Both connected English speech and nonsense materials were provided in each unit. Separate from the program of eight units, and providing a learning resource in its own right, a virtual Listening Centre provided a library of recorded and transcribed material which was constantly available for reference and practice.

3.4.2. Promoting interaction and discussion

In general, answers to exercises could be revealed as soon as students were ready; no attempt was made at automatic scoring of complex ear-training material. Increasingly as the course progressed, answers and instructors' comments for selected exercises were withheld for a time and students encouraged to exchange solutions in the Discussions forum.

3.5. Assessment

Each unit included an assignment to be submitted for grading. Submission took the form of a Word document or PDF, and made use of the VLE's standard provisions for uploading and logging assignments. Unsurprisingly, the grading and feedback process proved challenging and time-consuming. A two-tier system of detailed feedback was evolved, in which general feedback relevant to all students was supplemented by individual

explanations targeted at each participant. Once issued, the general feedback was kept available as a resource within the assignments area of the course.

The final assessment took the form of a one-hour multiple-choice test (a practice test was also provided), accompanied by a transcription-from-audio task (without specific time limit) of the type that had been utilised throughout.

4. THE STUDENTS

4.1. Recruitment and admissions

All recruitment and admissions took place online, following announcement on an institutional website and postings to a small number of relevant mailing lists. It was no doubt an inducement that participation in the pilot was without charge, but the scale of response was surprising. Within twelve days of the initial announcement, 147 applications had been received from 40 countries (Figure 1). In terms of phonetic knowledge, 31 applicants classified themselves as advanced learners of phonetics, 96 as having basic knowledge and 20 as having no prior knowledge. An admissions procedure was established to deal with the unexpectedly large number of applications. Twenty five students were admitted, and a waiting list established.

Figure 1: Cumulative applications numbers
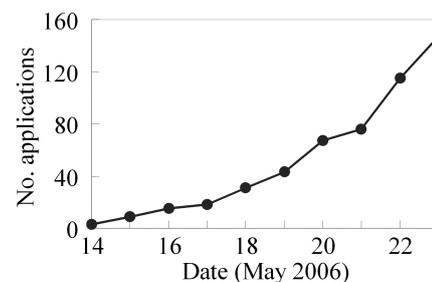
4.2. Workload and retention rate

All 25 participants were successful in logging into the course at least once, and 24 became regular users. Students could log on at their convenience but were expected to spend at least 2 to 3 hours online every week. Results from the evaluation questionnaire confirm that this was a realistic estimate, with the greatest number reporting 2.5 to 5 hours of online study per week (Figure 2).

The number of assignment submissions peaked at 22 for week one. A total of 18 persisted till the

last unit and 16 progressed to the final assessment, giving an overall retention rate of 64% (Figure 3).
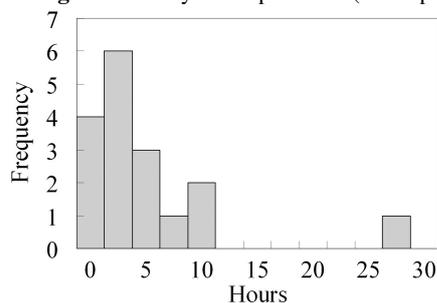
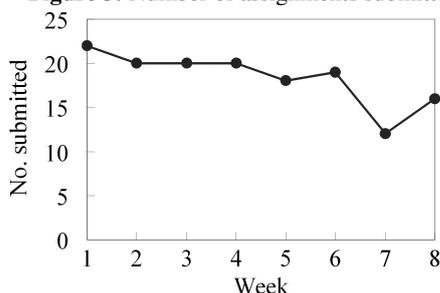**Figure 2:** Study hours per week (self reported)

Figure 3: Number of assignments submitted

4.3.   Evaluation

An evaluation questionnaire was administered in the final week of the course, and 17 responses were submitted. The questionnaire was designed to include the same core questions as the questionnaire used on campus, plus others specific to an online distance course. Fifteen of the 28 questions measured satisfaction with various aspects of the design, organisation and delivery of the course, on a five-point scale, with "1" = "strongly agree". The average score for these questions was 1.34, and the mode = 1, indicating a high degree of overall satisfaction. A large majority of participants reported that they would recommend the course to other students, and that they would undertake further online courses on the basis of their experience with PHONLINE.

5.   FUTURE DEVELOPMENT

5.1.   Applications

This project demonstrates that with suitable development most of the elements of on-campus introductory phonetic training can already be replicated within a VLE. An appropriate next step will be accreditation of a distance course – perhaps at a level such as that of the IPA Certificate [5]. In the meantime, we plan to run the present course

again, and are also migrating the techniques to support existing courses, and to serve as an adjunct to the admissions process for advanced on-campus courses.

5.2.   Directions for research

The pilot course demonstrated ear training with a library of pre-recorded materials, and feedback with which participants can compare their transcriptions, but arguably falls short of the spontaneous, improvised and equal interaction of a live phonetics class. The desirability of greater interactivity was already commented on by participants in the trials, and at more advanced levels interactive exchange among all participants becomes increasingly important.

In further work now in progress, we aim to develop opportunities for greater interactivity and particularly to explore the use of further audio tools (such as VoIP), both within and in parallel to the VLE, to achieve this.

6.   ACKNOWLEDGEMENTS

7.   REFERENCES

[1]   Boersma, P, Weenik, D. Praat. http://www.praat.org visited 12-Feb-07

[2]   Collins, B. and Mees, I., 2003. *Practical phonetics and phonology: a resource book for students*. London: Routledge.

[3]   Cruttenden, A., 2001. *Gimson's Pronunciation of English*. Sixth edition. London: Arnold.

[4]   Huckvale, M. SFS Speech Filing System, http://www. phon. ucl. ac. uk/ resource/ sfs/ visited 12-Feb-07

[5]   International Phonetic Association Examination. http:// www. phon. ucl. ac. uk/ courses/ ipaexam/ ipa-exam.htm visited 8-Jun-07

[6]   juki – ipa phonetic unicode keyboard. http://www. phon.ucl.ac.uk/home/johnm/juki/jukix.htm visited 12-Feb-07

[7]   Phonetic symbols advice. http://www.phon.ucl.ac.uk/ resource/phonetics/ visited 8-Jun-07

[8]   PHONLINE Report. http://www.phon.ucl.ac.uk/home/ phonline/report.html visited 8-Jun-07

[9]   Proc. PTLC2005. http://www. phon. ucl. ac. uk/ home/ johnm/ptlc2005/ptlc2005_proc_index.htm visited 12-Feb-07

[10]   SAMPA computer readable phonetic alphabet. http://www. phon. ucl. ac. uk/ home/sampa/ index.html visited 12-Feb-07

[11]   Unicode Phonemic Typewriter. http://davidbrett.uniss.it/ phonemicTypewriter/phonemicTypewriter.html visited 12-Feb-07