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Article:

Training and Research in Phonetics for Spanish as a Second Language with Technological Support

Ana Blanco Canales
Universidad de Alcalá (Spain)

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ana.blanco@uah.es

Abstract

Foreign language acquisition must inevitably start with phonetics, an aspect of language whose importance is matched only by its neglect. Different research has shown how the systematic teaching of pronunciation is beneficial not only because it aids the comprehension of messages and their expression, but also because it diminishes the anxiety students feel when communicating orally. Furthermore, pronunciation is the first indication of social identity, with all that means for one's integration in or exclusion from a speech community. But nevertheless, phonetics practice takes a back seat in foreign language teaching programmes, in teacher training, in teaching material and, above all, in research work, and this is particularly true in the case of teaching Spanish as a second language. In order to redress this situation, researchers from nine universities have put together an oral corpus and developed a series of resources, tools and applications which can all be accessed at a website for cooperative and interactive work called Fono.ele. The corpus is the first to gather together a significant and representative number of oral recordings of learners of Spanish. It also breaks new ground in embarking on a general study of the pronunciation of Spanish/L2 in relation to social, cultural and educational factors. In addition, it makes available data regarding oral production and auditory perception. As for its applications, they enable those who may be interested (researchers and/or teachers) to handle and manage the speech extracts from the oral corpus, to carry out searches in the phonological errors data base, to obtain quantitative and statistical data, to interconnect text, sound and data, and to devise training exercises. All the foregoing can be done using our materials (that is, in collaboration with the *AACFELE* Project) or the user's own materials (for the preparation of new projects). Our article describes these resources, explains their features and functions, and indicates the options they offer different kinds of users.

Keywords: Phonological component, Spanish/L2, training, investigation, technological resources.

1. Phonological competence

Phonological competence is vital to language acquisition and development since it is the outward manifestation of the complex web of linguistic knowledge, skills and abilities stored in the human brain. It is the capacity an individual may have to produce and recognise the elements proper to a given language, as well as to identify others which are not (Iruela, 2004: 35). According to the *Common European Framework of Reference*

for Languages: learning, teaching, assessment (2002: section 5.2.1.4) it may be defined as the skill to perceive and produce: a) the sound-units of a language (phonemes) and their realisation in particular contexts (allophones); b) the phonetic features which distinguish phonemes (e.g. voicing, nasality, occlusion, labiality); c) the phonetic composition of words (syllable structure, the stress pattern of words); d) the phenomena of coarticulation (assimilation at the point of articulation, shortening of atonic vowels, articulatory relaxation, elision of consonantal sounds); e) sentence stress and rhythm; f) intonation. Phonological competence plays a key role in carrying out oral language skills, namely, oral expression, auditory comprehension, and oral interaction. On the one hand, pronunciation is the means whereby information is transmitted as a result of which the listener's understanding or otherwise of the message will depend on the quality of that transmission. It is also freighted with highly important communicative values, transmitting as it does attitudes, intentions, sociocultural information, expressive contents, and so forth. On the other hand, perception is one of the basic processes which compose auditory comprehension. If an individual fails to recognise correctly the segments forming part of an oral text, he or she will find it difficult to understand and interpret. The implication of this is that there is a direct relation between the capacity to perceive and discriminate L2 phonological elements (phonological contrasts, the sounds that represent each phoneme, rhythm, intonation, word and sentence stress, and so on) and greater facility to comprehend the message. We may therefore say that inadequate phonological competence hampers or makes impossible oral expression and comprehension.

This is why foreign language acquisition should necessarily start with phonetics. Nowadays there are no doubts surrounding the importance of pronunciation teaching to foreign language learning, or of the advantages for communication of appropriate, clear and correct pronunciation. All involved -students, teachers, programme designers, writers of material- are well aware of that, as numerous articles have pointed out. But a quick look at the teaching material currently in use reveals that it is an issue which is most often ignored or at best occupies a back seat.

There are various reasons for this contradictory state of affairs. On the one hand, there are the methodological approaches themselves, above all the communicative approach which currently holds the field: they do not attach the same importance to phonetic and phonological contents as the rest. The attention paid to this aspect of the language is limited to the amount of time the student needs before being able to communicate (Poch, 2004). In other words, any interest in pronunciation evaporates once the latter ceases to hamper comprehension of utterances. However, various pieces of research have proven that the systematic teaching of pronunciation is beneficial to language acquisition not only because it enhances comprehension of messages and aids expression, but also because it diminishes students' anxiety when faced with oral communication (Elliot, 1997).

The widespread belief that imitation is sufficient if one wishes to master the phonetic aspects of a language also leads to a lack of emphasis on teaching pronunciation. A further reason for its neglect is the lack of specific training for teachers, who have normally received some theoretical instruction in Spanish phonetics and phonology, but never any practical training, at least in relation to language teaching. In content areas such as grammar, vocabulary, functions and culture, the teacher learns as a result of his or her teaching experiences; but this sort of self-training is very difficult given the nature of phonetics and phonology and the lack of tools with which to train oneself effectively. At the same time, training courses for Spanish teachers devote little time if any to pronunciation, while it is easy to see that there is less related research and fewer

researchers in this aspect of Spanish teaching than in others. In a word, it is a furrow that receives little ploughing.

If this state of affairs is to be redressed, oral materials and analytical tools are required which will facilitate the development of studies of different kinds regarding the acquisition and learning of the phonological component. The results of these studies will be applicable or transferable to teaching, to the design of teaching material, to curricular planning and course design, and to teacher training. At present no oral corpora of recordings of non-native speakers are available, much less computer tools and analytical instruments (transcriptions, error types, tests) which might enable the layman to obtain information and data for immediate use and application. It is this void which Fono.ele hopes to fill.

2. Fono.ele: an interactive training and research website

The Fono.ele website (http://www3.uah.es/fonoele/index.php) is the outcome of the AACFELE *(Adquisición y aprendizaje del componente fónico del español como lengua extranjera)* research project, financed by the Spanish Ministry of Science and Innovation as part of the National R+D+i Plan (Ref. FFI2010-21034). Under the leadership of the University of Alcalá, it gathers together researchers from another eight universities: La Laguna (Tenerife), Kapodistriaka (Athens), Fu Jen Catholic University, Tamkang University, University of Paderborn, University of El Cairo, University of Silesia and the University of Braganza. It makes available training and research tools to anyone with an interest in the phonological component of Spanish/L2. Our main goals for it are:

- To develop highly practical lines of research into the acquisition and learning of Spanish as a foreign language.
- To analyse and identify the basic errors in the Spanish of non-native speakers in relation to linguistic factors (mother tongue, level of knowledge, register) and sociocultural ones (nationality, age, sex, educational level, relationship with foreign country).
- To study the psycholinguistic and physiological factors behind the most significant cases of error (reception/phonation), as well as the social impact of those errors (sociolinguistic attitudes of natives towards non-natives, rates of acceptance/rejection as a function of phonological correctness, and so on).
- To provide language samples (corpus) and the tools required to handle, search and quantify data with a view to facilitating the development of various kinds of research (theoretical or applied, didactic or methodological).
- To demonstrate to companies dedicated to the production and publication of teaching materials students' learning requirements in terms of phonology and phonetics.
- To make available to teachers and the designers of teaching material information, data and examples related to the areas that need to be worked on in the classroom in accordance with the characteristics of the group and the educational situation.
- To provide Spanish teachers with an opportunity to benefit from practical and useful (self-)training in this area (by means of their own experience of phonetic analysis) so that they may grow accustomed to phonetic diagnosis and assessment.
- To provide teacher-trainers with an interactive learning space where they can work with their students.

The website offers four main working tools: **Fono.data**, **Corpus Fono.ele**, **Fono.Elearning** and **Fono.ele+** all of which have been designed to have a two-fold function. On the one hand they are training and research tools for the *AACFELE* project. On the other, they are resources intended for use by teachers and researchers with an interest in developing their own projects along similar lines to ours. The hope is to build a research and study community around the *AACFELE* project given that the material it

contains will enable many works of scientific research to be carried out. But we will also make available to other professionals the resources required to pursue their own projects, design their own courses, and so on, as well as offering scope to adapt those resources to diverse circumstances, purposes and variables. These initial goals account for the chief characteristics of the Fono.ele tools, namely: flexibility, versatility and multifunctionality.

Figure 1. Fono.ele website.

2.1. Fono.data

2.1.1. Phonetic production and perception. Data collection tools

The study of foreign language acquisition and learning must not solely concern itself with matters of production, however fundamental they may be. It must also take stock of perception, for the phonetic acquisition of a language is conditioned by the way students perceive new sounds. For some (Flege 1980, 1991; Wode 1994, 1996), similarities or differences between L1 and L2 as perceived by the learner play a key role in how he or she configures the new system as well as enabling difficulties and transfer processes to be predicted. To state matters in very general terms, as far as similar sounds are concerned, the learner will assimilate the new element to some L1 phonological category instead of going to the trouble of creating a new category for such a small phonological difference. However, when the sound is markedly different, the learner will not associate it with any L1 sound but will construct for it a new

category, with varying success. The conclusion is that a different sound is comparatively easier to acquire than a similar one.

The *Fono.ele* corpus is chiefly composed of samples of speech (production), although it houses perception data too. Naturally, the **instruments** used in either case are very different. In order to gather **production data** we made use of recordings with varying degrees of formality and of attention to what was being said. This allowed us to incorporate speaking style as an analytical tool for assessing the real extent of phonetic difficulties and the inter-relationship between L2 pronunciation and the production of fluent oral discourse (that is to say, the extent to which pronunciation is neglected when efforts are concentrated on the message). We devised four different assessment procedures:

- A short, structured conversation in which both speakers talked about a prescribed topic with the aid of a list of questions to prompt conversation.
- Reading texts: each speaker recorded two different texts, one dialogical, the other narrative.
- Reading phrases: 36 phrases geared particularly to the analysis of suprasegmental phenomena (phonological groups and intonation).
- Reading words: 297 words covering all the selected segmental units in their different phonological contexts. Volume was also noted.

Figure 2. Instruments to gather production data.

Each speaker took part in two types of session: a recorded session with a partner (for the structured conversation) and a recorded individual session (for reading). The conversation was recorded first to ensure that the result was as natural as possible. No explanation regarding the specific focus of the research ("study of pronunciation") was given to the speakers; instead, they were simply informed that it was part of research into learning Spanish. In the course of the conversation the speakers were more attentive to matters of grammar and vocabulary than to phonetics. Afterwards, and on

an individual basis, each was recorded as they read, starting with the texts and ending with the word lists. As the session proceeded, they began to notice that the focus of the research was their pronunciation and accordingly made an effort to improve their pronunciation. By the time they came to the reading of the words, their care and attention were at their peak. Thus we were able to obtain speech samples from **two quite distinct registers** ([+ formal] / [- formal]).

The **perception data** were gathered by means of a multiple choice test geared oriented equally to segmental and suprasegmental features. Unlike the materials designed to gather the production data, which were generic and undiscriminating in so far as, with the exception of the word lists, they all enabled the sounds, intensity, phonetic groups and intonation of all respondents to be analysed irrespective of their mother tongue, the analysis of perception required a tailor-made test for each nationality comprising matters of particular complexity. The structure and length of the test was the same in all cases and consisted of:

- 14 questions aimed at detecting problems with vowels and consonants;
- 5 questions targeting volume;
- 4 questions targeting intonation;
- 5 questions about the respondents' attitudes and appraisals of the two linguistic norms reproduced in the recordings (central-peninsular Spanish and Caribbean Spanish).

The perception tests were conducted in six large national groups of 60 respondents, giving a total of 360 tests in this first phase. The objective was to ensure that all the selected social and linguistic parameters (sex, age, linguistic level, and so on) were represented in proportions similar to the production samples.

Figure 3. Instruments to gather perception data.

The data collection was complemented with a test of beliefs, attitudes and motivation regarding Spanish phonetics and the systematic learning of this aspect of the language. As with the perception test, 360 students responded in 6 national groups of sixty.

2.1.2. Data collection tools on the Fono.ele website

The Fono.data section makes available the tools required for a full collection of phonetic competence data, namely:

- Guides about how to conduct the structured conversations.
- Repertoire of texts, phrases and words for reading and recording.
- Listening material, transcriptions and answer sheets for perception data collection.
- Perception tests adapted to students with six different mother tongues (Polish, Portuguese, Greek, Arabic, German and Mandarin Chinese).
- Attitudes and motivation test.

There are three different conversation guides, one for each language level, A, B or C. In each case the difficulty of the questions and the subjects to be covered are tailored to the knowledge the students are assumed to have at each of those levels. Accordingly, guide A is chiefly concerned with personal data, likes and dislikes, habitual activities, family, leisure and sports. B focuses on appraisals and knowledge of Spanish language and culture, learning experiences and preferences. C tackles the subjects of travel undertaken or planned, and work (professional experience, looking for work, most likely sectors).

The repertoire of texts, phrases and words is the result of painstaking work with the aim of covering the greatest possible number of significant and important Spanish phonetic elements. In this regard, much effort was taken to reduce the infinity of elements that composes the Spanish phonetic universe to a manageable number. One consequence was that we discarded all dialectal, sociolectal and stylistic realizations in order not to go beyond the more abstract plane of allophonic variants.

The phenomena gathered belong to both the segmental level (sounds and sound groups, the latter including sounds generated phonotactically) and the suprasegmental level (volume, phonetic groups and intonation). In the repertory these are put into groups according to the focus of their interest (vowels, diphthongs, hiatus, unvoiced occlusives, palatals, and so on and so forth).

Since sounds do not occur in isolation when pronouncing a language but are in contact with one another and permanently influenced and modified by their neighbours, each one must be studied with an eye to its most frequent or most significant combinations. It is often the case that articulatory problems are not due so much to emitting the sound in a "pure" state as to pronouncing it in a context (coarticulation). This point is of particular importance when learning a language because it enables practice, correction and teaching to be properly focused. Our project's data collection and analysis tools were designed in such a way that the incidence of different phonetic features (preceding and succeeding sounds, volume, syllabic structure, position…) in the emission of a particular element could be studied. In this connection we attempted to ensure that the phonetic units that interested us cropped up in the recorded material in different contexts.

With a view to maximising sound quality, the audios for the perception data collection were recorded in wav format by four professional voice-over artists in a multimedia dubbing studio. The whole process was supervised by a telecommunications engineer with ample experience in voice treatment. Two of the voice-over artists were male, two were female; of these, one pair (male and female) spoke a central-peninsular linguistic standard, the other a Caribbean standard.

The attitudes and beliefs tests was divided into three parts. The first aimed to find out the value students attached to correct pronunciation and their interest in improving it. The second was concerned with the students' motivation regarding the systematic learning of pronunciation. The third addressed affective issues such as difficulty, anxiety, embarrassment or error.

2.2. The Fono.ele corpus

2.2.1. Corpus description

At time of writing the *Fono.ele* corpus comprises speech samples from German, Greek, Taiwanese, Polish, Portuguese and Egyptian students with Spanish *ECFR* (2000) levels ranging from A2 to C1. In the future we hope to increase the number of nationalities represented and the language levels of the respondents.

When compiling the samples we adopted the intentional quota sampling technique. This consists in dividing the population into groups and finding respondents for each group so that all groups are represented. The respondents are chosen by the researcher on the basis of their compliance with some pre-established criteria. In our case, we actually created six sub-samples, one for each nationality. Each of these sub-samples was represented by 16 respondents, 8 male and 8 female. Thus our initial corpus consisted of 96 speakers.

In view of the corpus's nature (Spanish students with different levels and from different countries), we attempted to homogenise the characteristics of the speakers in order to minimise differences between some countries and others and enable comparisons to be made. Nevertheless, as we wanted to study the processes of acquiring, learning and teaching the phonological component in the light of some of the parameters which, according to the literature on the subject, are relevant or play some part or other, we attempted to cater for the variables which might turn out to be significant, discarding other features which would only make the implicit variety more complicated still without contributing any results of interest to our project. Finally, when creating the simple we took into account social factors (age, sex and contact with Spanish) and external linguistic factors (language level, second foreign language and learning experiences).

As far as **sex** was concerned, we used the same number of males as females even though there were actually considerably more female students than males. We adopted this parameter as it would allow us to check whether females are more sensitive to the relevant rules and to correction, as is the case with mother tongues (García Moutón, 2000); if so, it would indicate that the females had greater interlinguistic awareness in their interlanguage.

The **age** factor was differentiated between two groups: Group 1, from 18 to 25 years of age; and Group 2, from 26 to 35 years of age. Any systematic changes, however slight, in the phonetic behaviour of both groups would enable the theory of the critical period—after which period it is impossible to acquire a new phonological system—to be questioned since they would demonstrate the existence of a process of evolution, albeit negative (that is, the greater the age, the lower the capacity). Should no significant differences be detected between the two groups, it would be reasonable to think that, indeed, once a certain age is reached the process comes to an end and phonological competence cannot be developed further.

The **contact with Spanish** variable attempts to gauge the importance of travel, social networks, Spanish culture and so on in the acquisition of phonetic skills. Four different degrees of contact were established: high, medium, low and very low. The placement of a given speaker at a given level was decided on the basis of the average score achieved

in two dimensions: travel and daily life. Both these variables were in turn determined by three factors, as shown in Table 1:

TRAVEL	DAILY LIFE
Number of visits to Spanish-speaking countries in last five years One 1 point Two 2 points Three 3 points Four or more 4 points	Spanish-speakers in speaker's social network None 0 points 1 to 3 1 points 4 to 6 2 points 7 or more 7 3 points
Length of each visit 1 week or less 1 point Fortnight 2 points 1 month 3 points More than 1 month 4 points	Use of Spanish outside classroom Never 0 point Rarely 1 points Sometimes 2 points Often 3 points
Use of Spanish during visits None or very little 1 point Sometimes 2 points Frequent 3 points Always or almost always 4 points	Culture in Spanish (music and films) Never 0 point Very rarely 1 points Sometimes 2 points Often 3 points
If there has been **no** visit to a Spanish-speaking country, the score for Travel is 0.	

Table I: Factors defining the *contact with Spanish* variable.

Speakers scoring between 19 and 24 points obtained a *high* degree of contact with Spanish; those between 13 and 18 points, a *medium* degree; between 7 and 12 and between 0 and 6, *low* and *very low* respectively.

As for the speakers' **linguistic characteristics** , we tried to ensure that in each of the sub-samples (German students, Polish students, and so on) the speakers only had one mother tongue and that it was the same for all (either the particular country's official language or the most-spoken variety). In the same way, our aim was for all respondents to possess the same dialectal variant since geographical diversity might give rise to erroneous interpretations of many phenomena. As for possible sociolectal varieties, we also felt it advisable to eliminate differences as far as possible in order to minimise the effects of each community's natural social diversity.

On the other hand, we did seek heterogeneity with respect to **second foreign language** (the first had necessarily to be English), **level of Spanish** (A2, B1, B2 and C1) and **previous learning experiences**. The aim of this last parameter was to assess the impact of systematic work on phonetics on pronunciation quality. Three levels were established:

- Has worked/works habitually on phonetics in the classroom.
- Has worked/works sometimes on phonetics in the classroom.
- Never or almost never has worked/works on phonetics in the classroom.

2.2.2. The website corpus

There are two ways of accessing the corpus: as a general user of the Fono.ele website or as a registered user of the *AACFELE* project. The former may consult 25% of the total production corpus, amounting to around 7,000 files. We have tried to ensure that this material is a balanced and faithful representation of the whole, in other words, is an "abridged corpus" with identical social and linguistic characteristics. To help with

searching we have created a simple tool for selecting audios on the basis of the different social variables taken into account (nationality, age, sex, contact with Spanish and language level). Access to the whole corpus is open to those who work or collaborate with the *AACFELE* project on one of the many tasks related to error analysis or perception studies. In this case access is gained from the Fono.ele+ tool.

Figure 4. Search of audios in Fono.ele+.

2.3. Fono.Elearning

Our website also houses a space for teacher training which offers two quite different tools:

- A self-learning tutorial enabling basic knowledge to be acquired about the phonological component and particularly the development of phonological assessment and analysis skills. This tool is intended for teachers with little experience who wish to deepen or improve their knowledge on the basis of their own praxis.
- An open-source e-learning platform which allows teachers to create dedicated courses incorporating all available theoretical contents as well as other material and resources (texts, audios, instruments, worksheets, and so on). Teachers can work with their students by using the assessment and monitoring tools (projects, tasks, self-assessment, reports, and tables) and the communication tools (forums,

chats, wikis) provided on the platform, thus enabling an interactive learning environment to be established.

The tutorial deals with the main issues concerning the phonological component of Spanish/L2 and its teaching-learning. The contents are organised into five blocks, each of which is divided into learning sessions in which theoretical matter is always liberally illustrated from our own materials. Each session also has a series of activities to reinforce the contents, check comprehension of them and apply what has been learnt.
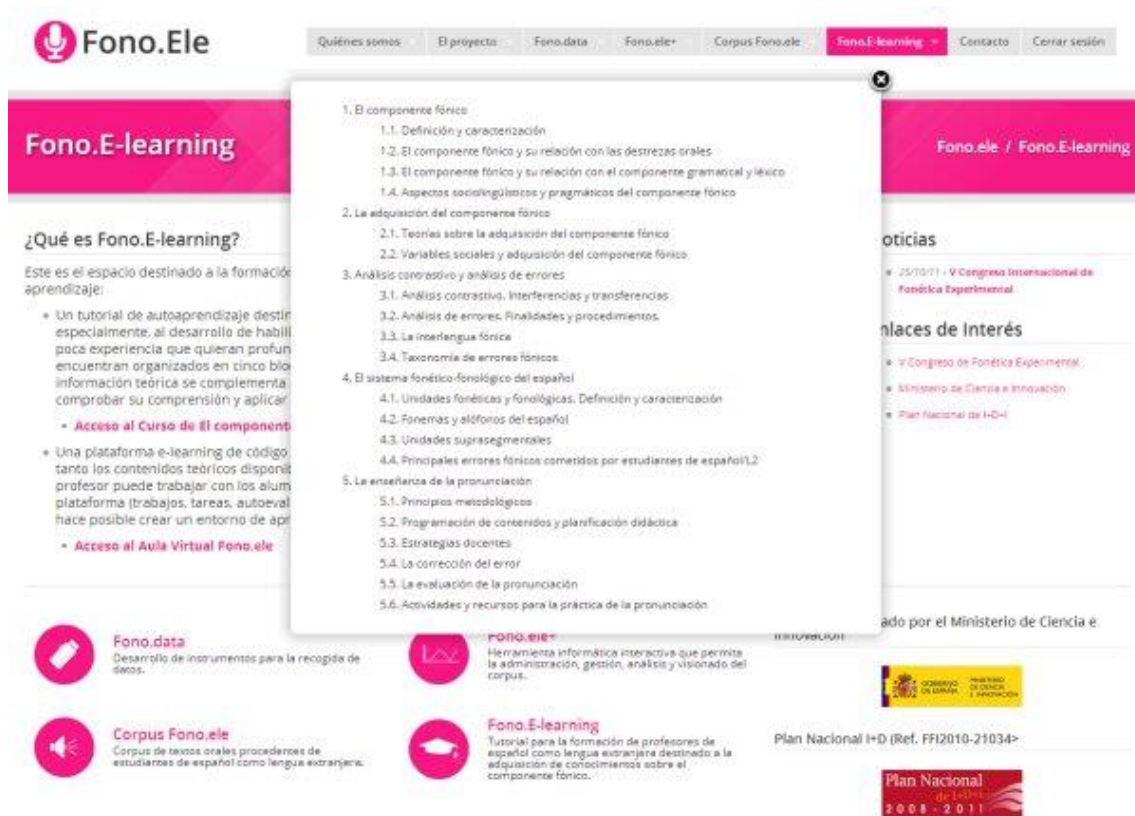

Figure 5. Fono.Elearning. Contents of the training course.

2.4. Fono.ele+

Fono.ele+ is an interactive information system which allows the corpus and all elements associated with it or developed from it to be analysed and viewed. Basically a database, it not only administers all audio, text, error and response content, but is also responsible for interrelating the different materials and information (linguistic and extralinguistic) held by the system. It is a MySQL-type relational database of the kind employed widely in the development of web applications on account of its versatility and ease of use.
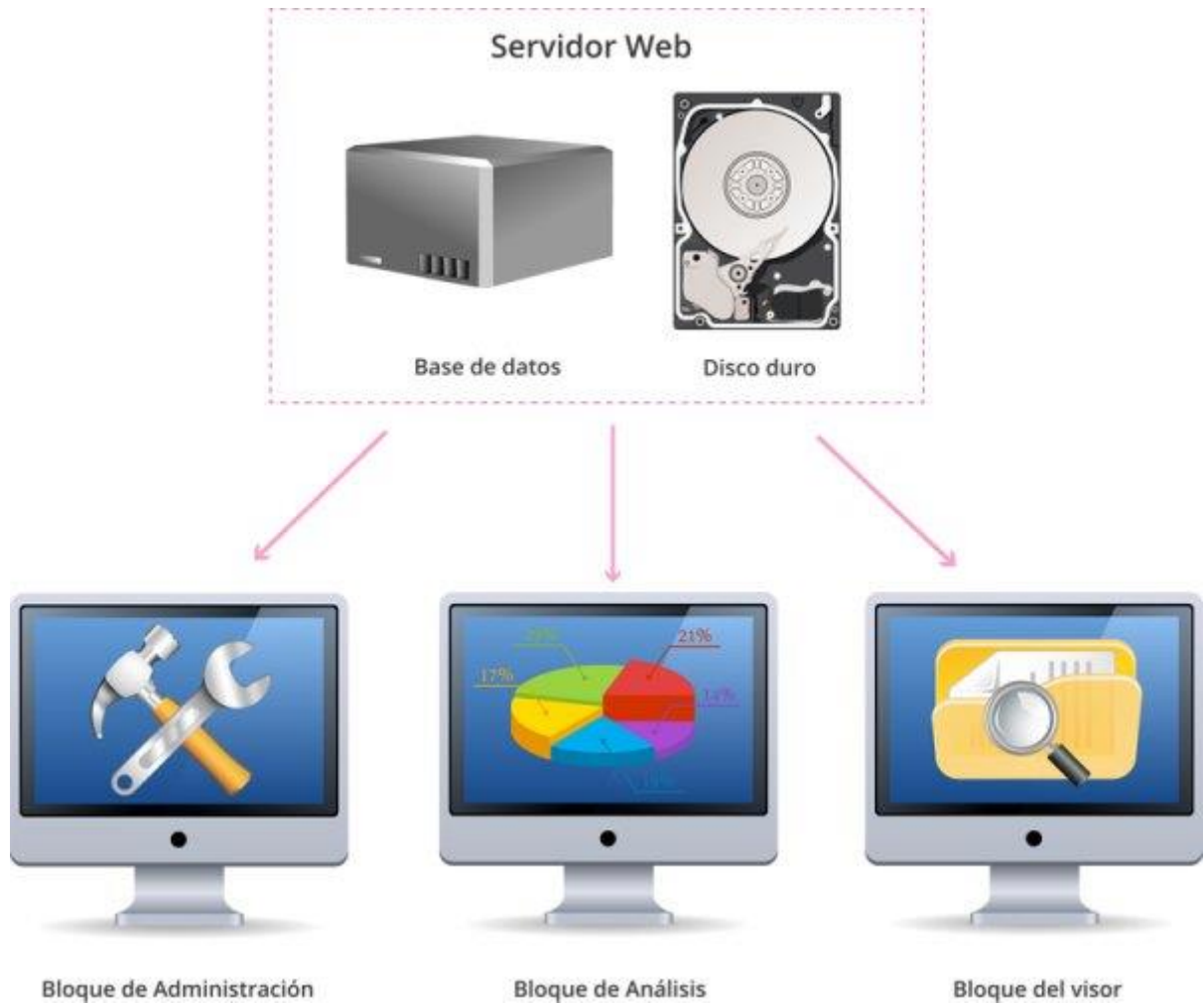
13

Figure 6. Fono.ele+ structure.

Fono.ele+ has three main sections:

- The administration panel.
- The oral production zone.
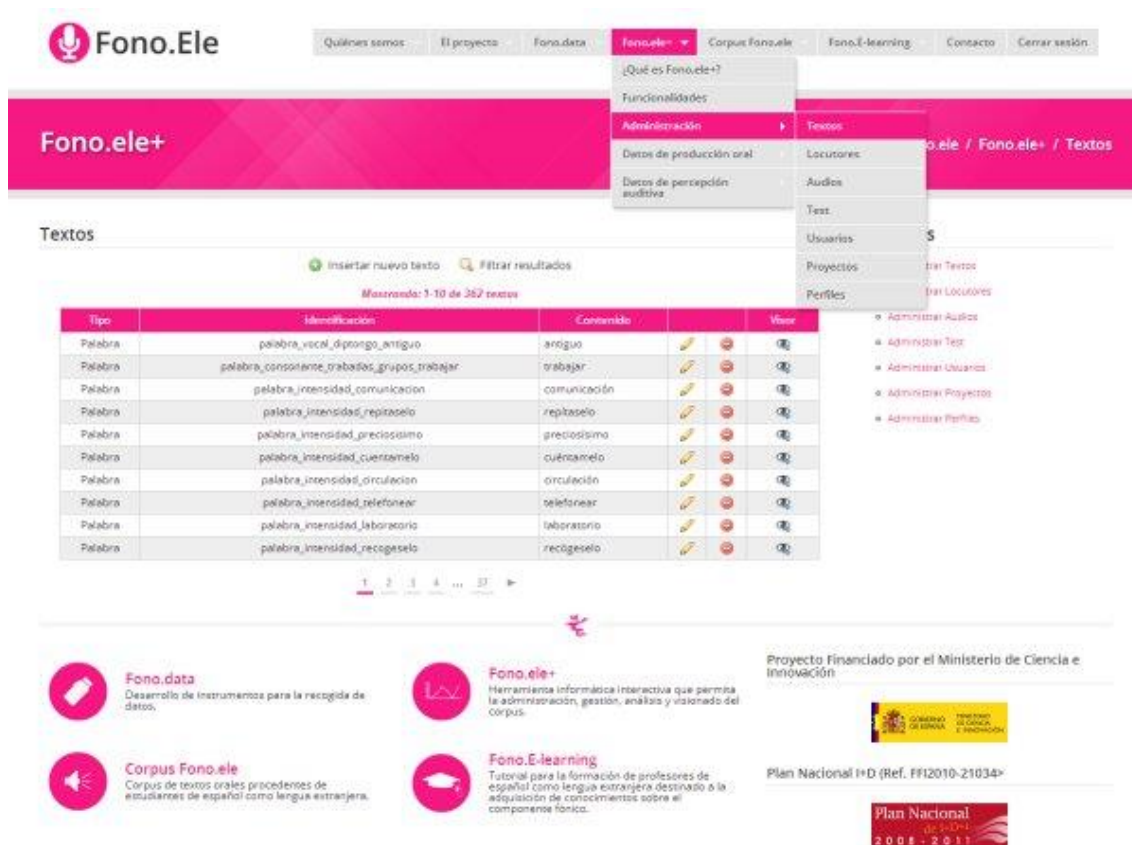- The auditory perception zone.

Figure 7. Fono.ele+ administration.

2.4.1. The administration panel

This tool enables the easy introduction, handling and relation of information within the corpus with no need for any special technical knowledge.

It has five main sections permitting management of Users, Respondents, Texts, Audios and Tests. Access, user authorisations and cancellations, and profile assignment is managed from the **Users** section. Since it includes an access system protected by User ID and password, different levels of user with different rights can be set up. The current profiles are:

- **Administrator:** a person who can add, edit, delete and view users, respondents, texts, audios and tests; also to add errors to the database, carry out analysis and use the viewer; finally, to fill out tests and perform analysis of them.
- **Researcher:** a person who can see and consult respondents, texts and audios; can add errors and use analysis and viewer; can fill out perception tests and perform statistical analysis.
- **General user:** a person who can use the statistical analysis applications for production and perception, and the viewer.

Figure 8. User administration.

At the same time, on registration all users will be assigned a research project permitting them to view or manage the data of that project without it being interrelated with data from other different projects. The main project is *AACFELE* (our own), and its are the only administrators who can create users for other projects. Let's imagine that a user creates *Project 2* with its audios, user, texts and so on. That project's administrator will be able to create researchers and general users for that project, but not for others, while *AACFELE* 's administrator can create users for any project.

Figure 9. Project administration.

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This means that the tool has great scope for use ranging from research, through teacher-training and obtaining information, to results analysis. Thus, a researcher could be a collaborator in the AACFELE project and use the tool to perform new error analysis on the basis of the available audios and tests. Some researchers may wish to create their own projects on the basis of our methodological principles, procedures and resources. A teacher, meanwhile, could use it for practical training with his or her students and be able to see the analysis carried out, their results and so on. Anybody with an interest could simply enter in order to listen to audios or obtain information on the basis of the data already available.

The **Respondents** section allows information to be entered regarding the sociocultural and linguistic characteristics of the students of Spanish participating in the project.

Figure 10. Respondent administration.

From the **Texts** section new texts can be added and existing ones edited or deleted. The data base stores each text with three attributes: text type (conversation, text, phrase, word); a tag related to the category, such as *palabra_vocal_hola* (= word_vowel_*hola*) or *frase_entonación_interrogativa_1* *(=* phrase_intonation_interrogative_1), (each project can decide which tags to use); and the content of the transcribed text.

Figure 11. Text administration.

Audio files are added, edited or deleted from the **Audios** section. In order to facilitate the introduction of material into the data bases, we have devised a very strict naming system for audios so that on the basis of the information contained in the audio's name we can extract, on the one hand, the speaker's parameters (sex, nationality, age, contact with Spanish or pronunciation learning experiences) and, on the other, the tags of the text with which the audio is associated. Internally, the platform creates the respondent automatically if it does not already exist; if it does already exist, the platform associates the audio with it whenever the sociocultural parameters obtained from the audio file name coincide with those already known; otherwise, an error message is generated and the audio is not catalogued. In short, this section permits an audio to be uploaded and catalogued by inheriting the parameters of the associated respondent and text.

Figure 12. Audio file administration.

Figure 13. Audio file administration. Selection and playlist.

The **Test** section enables multiple tests to be created and assigned to the countries for which they are valid. A test is created by inserting in the model question groups, each with their corresponding questions and possible answers, only one of which is valid in each case. Once the test has been created, it is configured as visible and may be completed from the Perception zone. Here is an example.

- We create a test called *Test 1.*
- We add a group of questions: *Mark the tonic syllable.*
- We add a question, for which "a title" is required (for example *pájaro),* as well as the options (for example: 1. pá - 2. ja - 3. ro) and the correct answer (2). We then add another question (for example, *papeles*) with its options (1. *pa* – 2. *pe* – 3. *les)* and the correct answer (2).

On the basis of this information the corresponding test is set up in the Perception zone where it may be completed with the answers of each respondent.

Figure 14. Test administration.

2.4.2. The oral production zone

This section is intended for the introduction and analysis of phonological errors identified in the corpus. It is divided into three sections: Data, Analysis and Viewer.

The **Data** section allows us to record and describe every one of the errors. As with previous sections, this is carried out by means of a form including both identification parameters (linguistic nature —phonetic or phonological— and element type — segmental or suprasegmental) and error classification parameters (underlying processes —addition, elimination, substitution, modification or displacement— and effect on communication —prevents, hampers or no effect). On the basis of these parameters a code is generated which allocates this error type a unique identity which will be used later in the analysis and the viewer in order to group and view errors. Drawing up the table and its parameters called for a great deal of reflection and research since there are no generally valid error taxonomies which also offer descriptive precision (Blanco and Nogueroles, 2012a, 2012b). The underlying classification is the result of analysing the most frequent pronunciation errors in students of Spanish of twelve different

nationalities. The table is also the most complex and time-consuming to fill in since thousands of errors have to be identified and coded.
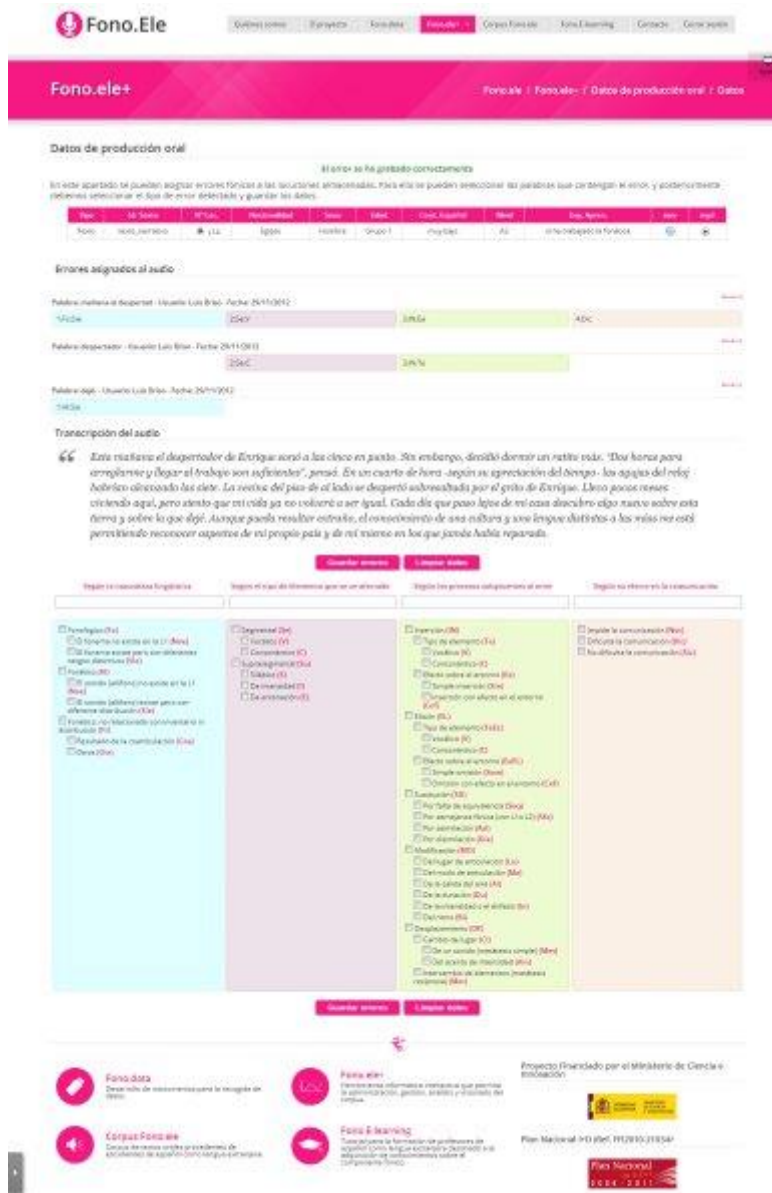
Figure 15. Introduction of phonetic or phonological phonic errors.

Different kinds of quantitative studies (absolute figures, percentages, averages, comparisons, and so on) can be performed from the **Analysis** section. The results can be obtained in written form or graphically.

There are countless options when searching for data since the variables we would like to be taken into account can be selected as well as the source of those data, in other words the profile from which they have been introduced (think, for example, of the case of teachers and students, or of collaborators). We can search for the total occurrences of the same error (or error type) in speakers (male and/or female) of the same nationality; compare the same error across nationalities among all respondents from the same age group; quantify the errors of emphatic intonation according to whether instruction in pronunciation has been received or not; and so on. In short, the data that can be obtained are so many and varied that there is scope for a whole range of studies into the nature of pronunciation learning, its teaching, and so on.

The application permits the results to be stored in external devices in the format of choice (PDF, Word, Excel); it also gives the option of saving in the platform itself the data search preferences corresponding to the analysis carried out; that is to say, labels can be given to the analyses carried out so that they can be visualised again in future without having to select all the parameters from scratch.
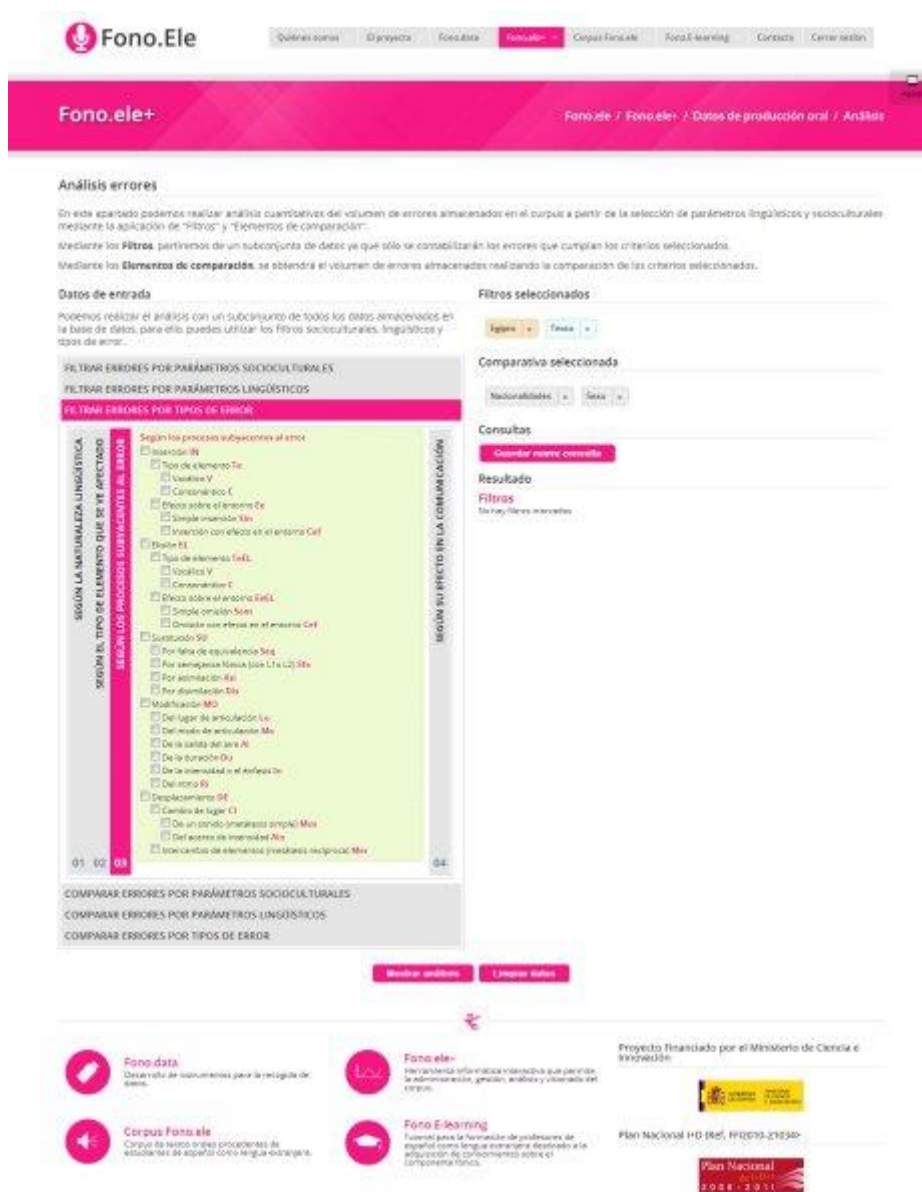
Figure 16. Analysis of data. Selection of filters and comparative.
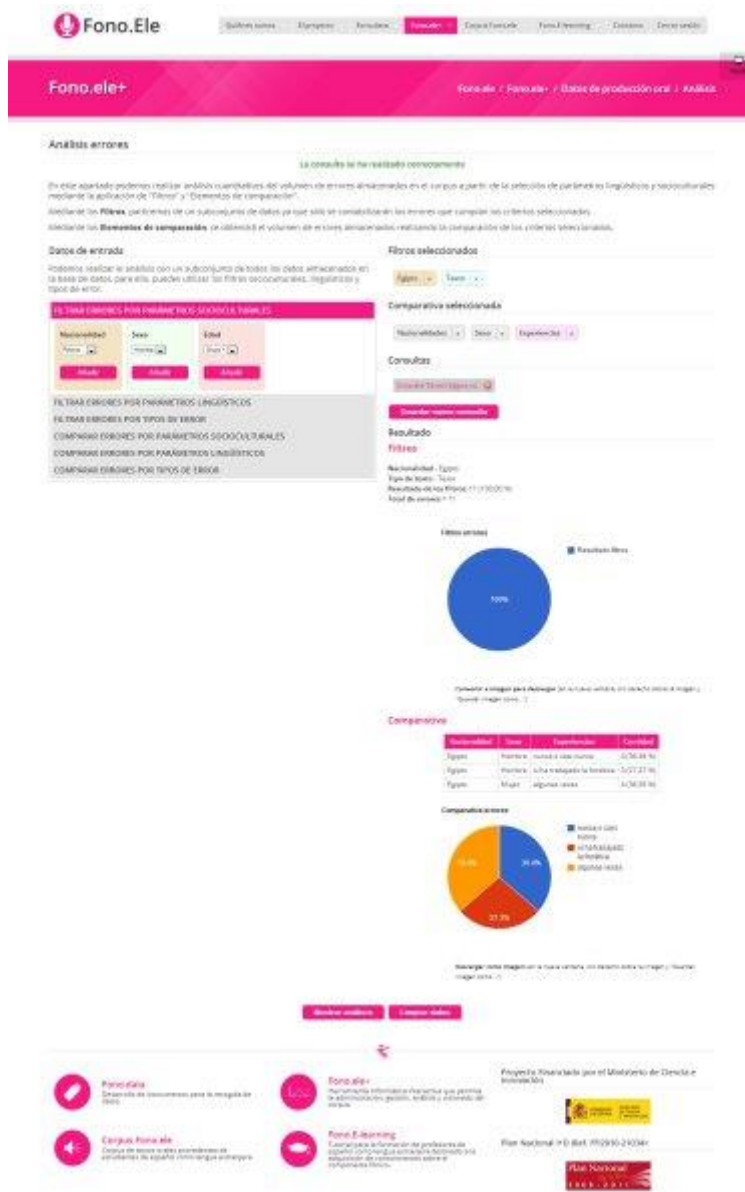
Figure 17. Analysis of data. Graphs.

The contents **Viewer** is a totally flexible tool which permits us to focus exclusively on what we want to see or hear. As before, its possibilities are extremely varied, depending as they do on the variables selected. It is also very easy to use. A text (conversation, text, phrase or word) is selected and the parameters of interest are set, both sociocultural ones (respondent, age, sex, nationality, etc.) and linguistic (vowel, consonant, addition, modification, aspiration, etc.). The errors of interest appear highlighted in the selected text. At the same the audios coinciding with the specified criteria can be listened to, thus providing sound evidence of the errors. When we are over one of the highlighted segments, a pop-up layer appears with a description of the error type together with its and its audio's specific data. In addition, if we click on the highlighted segment we can hear the audio clip containing the error. The tool has been specially designed for teacher training since it offers the most eloquent description imaginable of the errors as described in specialist literature.

www.manaraa.com

Figure 18. The contents viewer.

2.4.3. The perception zone

The perception zone contains everything related to the results obtained in the tests performed by the respondents, perception tests and attitudes and motivation tests alike. From this zone data can be introduced and analysed; accordingly it is divided into two sections:

The **Data** section corresponds to the registry of responses. This is subdivided in turn into perception data and beliefs data. As far as perception data are concerned, it is necessary to select the nationality first as the tests differ in accordance with the respondent's mother tongue. As mentioned earlier, the questions that make up the test are directly related to the learners' main difficulties. There is no point searching for perception errors in elements which we know for sure present no difficulties to certain students. That is why we ruled out the use of a general, across-the-board test. Consequently those tests are shown which were previously created by a user-administrator and which allow us to see the questions organised into groups according to the set arrangement, together with their answers. It is a simple matter of moving to the answer template and assigning a respondent to each test.

The **Analysis** section allows the results to be quantified in accordance with the variables selected. As with production, we can carry out answer searches in accordance with one or several of the parameters taken into account by the project, and establish as many contrasts and comparisons we deem appropriate. But unlike the production errors, these data are grouped by nationality, although a mixed quantification is also possible (thereby permitting results to be compared in terms of mother tongue) when the test is valid for more than one country, as established when creating the test. The results are grouped by series of questions (each series corresponds to a content type, as is also established when creating the test) so that we are shown, for each series, the percentage of correct answers obtained from among all the respondents who comply with the selected filter of sociocultural and linguistic parameters.

3. By way of conclusion

The versatility, manageability and multifunctionality of the Fono.ele website make it an extremely useful technological resource for research and teacher training. On the one hand it will facilitate the work of those wishing to carry out relevant and significant — both quantitatively and qualitatively— research into the interlanguage of learners of Spanish, into the way phonological elements are learnt, the variables involved in that process, descriptions and classifications of phonological and phonetic errors, and so on. On the other hand, it will equip trainers and teachers with resources and means to acquire on the basis of their own praxis the knowledge and skills required to work successfully with pronunciation in the Spanish classroom. There is no doubt that the traditional neglect of this area of study and knowledge can be palliated thanks to technological development which enables the type of tools and resources required by phonetics research to be designed, along with the spaces best suited to the sort of collaborative work by numerous research teams which the phonological component calls for.

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Article:

Learning English Speaking through Mobile-Based Role-Plays: The Exploration of a Mobile English Language Learning App called Engage

Bowen Yang*, Shijun Zhou** and Weijie Ju***
EF Labs, Education First

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*ericyoung156@gmail.com | ** bobzsj87@gmail.com | *** juweijie@gmail.com

Abstract

Engage is a new form of mobile application that connects students studying English with teachers in real-time via their smartphones. Students receive target language through preparation dialogues, and then apply it to a role-play with a teacher. The conceptualization and development of Engage follows the user-centred design approach; and the product was built through multiple iterations: in the first iteration, students were invited to try out a paper mock-up; in the second iteration, students tried out a mobile prototype; in the external test, a fully functional application was released to App Store between October 25 and November 20, 2012, and 326 users downloaded it. The application was well-received by these test users, reflected in the post-study survey, student ratings, and students' usage records. The external tests proved that the technical environment of the application was feasible for production; and the operationalization of the teacher service and cost model were also proven to be feasible and scalable.

Keywords: Mobile Assisted Language Learning (MALL), user-centred design, role-play.

1. Background

Mobile Assisted Language Learning (MALL) has been widely recognized as providing "portability", "social interactivity", "context sensitivity", "connectivity" and "individuality" for language learners (Miangah & Nezarat, 2012, p.311). Over the past decade, a variety of mobile devices have been tried in the field of language education. PDA and QR Code have been used to design English learning systems and task-based language learning courses (Liu, 2009); mobile phones have been used to teach French listening and speaking skills (Demouy & Kukulska-Hulme, 2010); GPS on smartphone has served as a tool for contextual micro language learning for Mandarin vocabulary (Edge, Searle, Chiu, Zhao & Landay, 2011); and Nintendo DS Lite was used to carry out TOEIC self-studies (Kondo, Ishikawa, Smith, Sakamoto, Shimomura & Wada). However, the above-mentioned mobile devices covered in existing research are relatively out-of-date. With the advance of technology, smartphones are the dominant mobile device today. Education applications on smartphones are springing up, revolutionizing the way people learn foreign languages. In the App Store chart of the Education category on the

Chinese market on Jan. 21, 2013, 39% of the top 100 free apps and 34% of the top 100 paid apps were for language learning.

The booming mobile learning market and the promising trend in MALL has inspired the team in EF Labs (1) to design and develop a new mobile application which can serve as an add-on service for the language learners who study in Englishtown. However, although a large number of language learning apps are available in the smartphone app markets, published research on mobile language learning applications is limited; and publications on the subcategory of teaching speaking language on smartphones are almost non-existent.

To understand the most current developments in the industry, several top-ranked applications from the App Store were reviewed. In summary, SpeakingPal English Tutor has dialogues that students listen to, speak and review through its built-in speech recognition. AutoSpeaking adopts a 4-step teaching method: repeat the dialogue after a recorded sentence is played; shadow to speak while playing the audio; practise the dialogue through a role-play; and wrap-up by recapturing the words and expressions. All recordings can be revisited later on. Speaking Training and Liulishuo also use speech recognition technology to encourage learners to interact with the device; Liulishuo has further introduced a social element; students upload their recordings and post their rank scores.

The synchronous interaction between the student and a teacher (artificial or real), arguably is crucial in teaching and learning oral language. However, this feature is obviously absent for these top-rated products on App store. The synchronicity of interaction can take two forms: machine-to-human interaction or human-to-human interaction. Real-time machine-to-human voice communication involves expertise in the field of psychology, linguistics, acoustics, signal processing, computer science, and integrated circuit technology (Schafer**,** 1994), which is outside the scope of this project. And for the human-to-human mode, the barriers include scheduling, sound quality, operation, and cost (Kukulska-Hulme & Shield, 2008).

Due to the gap in the literature, the lack of existing solutions and the operation and cost obstacles, an exploratory and iterative approach was adopted here to design and test the functionalities of the new form of a mobile application.

2. Methodology

2.1. User-Centred Design

The User-Centred Design (UCD) approach was adopted here in the product development process in order to develop useful and usable products (Kujiala, 2003). UCD is particularly suitable for interactive product design. It is also called the human-centred design process. The ISO standard for Human-Centred Design Processes for Interactive Systems states: "Human-centred design is an approach to interactive system development that focuses specifically on making systems usable." (ISO 13407, 1999) In our case, the mobile application required intensive interaction between the product and target users. A UCD approach proved suitable.

Iterative design is one of the principles of UCD, which requires the product to be designed, modified and tested repeatedly. It allows for the complete overhaul and rethinking of design through early testing of conceptual models and design ideas (Rubin, 1994). It is generally agreed that usability is achieved through the involvement of potential users in system design (Karat, 1997). Following this approach, two major phases of iterations were conducted in our research, and in each iteration phase, users were involved to test and validate the product. The first phase was the internal tests phase, where the concept was developed, refined and validated through fast

prototyping; and the second phase was the external tests phase, where the finalized product was pre-released to App Store for 10 days.

2.2. Internal tests

The internal tests involved two iterations. In the first iteration, which happened in May, 2012, five students from Englishtown were invited for tests with paper prototypes. Paper prototyping involves creating rough hand-sketched drawings of the interface to use as prototypes, or models, of a design. It saves time and resources by allowing quick modifications before any real code or development (Snyder, 2003). Test students were asked to work on a role-play task "Renting an apartment in London", in which a student role-played a tenant talking to a teacher who role-played the landlord. Test students were given the task description and preparation materials with a sample dialogue with target language on a piece of paper. After preparation, students called the teacher through landline to carry out the role-play task. Prompt in the form of text and cue images were shown to students during their conversation over the phone.

The second iteration, which occurred on July 24th, 2012, involved another five students from EF English Centres (2) , who voluntarily joined the test after receiving an invitation from the service staff in the school. In this iteration, a usable prototype on iPhone was developed, as well as a functioning teacher client (a set of browser based webpages to serve teacher operations) with no back-end scheduling system. In the tests, preparation dialogue with translations and language points were presented as Step One in the application prototype, and role-plays as Step Two, conducted by connecting the iPhone with a landline phone. During the test, students were given an oral description of the product by the staff, and then they were given the prototype to play with. After finishing the preparation, a teacher called in to conduct the role-play with the students. Cue pictures were presented on the iPhone with remote control from the teacher client.

A face-to-face interview was conducted with each test student after the tests. Feedback relating to students' experience using the application, the role-play mechanism and their rating of the product were collected, which was directly fed into the next iteration.

2.3. External tests

After the internal tests, the learning concept took shape and a fully functional application with backend systems was developed. The application was test released to App Store between October 25 and November 20, 2012. Email invitations were sent out to students from Englishtown and 326 downloaded the application onto their iOS devices. Students were able to click the App Store download link in the email and download the application. After logging in, students could book classes for the role-play sessions through the built-in booking page. Four native English teachers from the EF online school were recruited to teach the classes. Classes were scheduled back to back, 15 minutes per slot, and 3 hours per day during the peak hour. In total, 150 classes were delivered; and 46 students have attended classes. For data collection, a survey tool was built into the application. Students were asked to rate the preparation dialogue and role-play task on a five-point scale. In addition, questions relating to the usability of the product, perception of the content, operational side, and rating of the product were covered in the post-study survey. Meanwhile, the students' attendance record was kept in the cloud server for later analysis.

3. Product framework

3.1. System architecture

A client-server mode (3) was used in the final design of this application. Firstly, the Client mode consisted of a student client application and a teacher administration portal. The major functions for the student client application were: content fetching and

display, pre-recorded dialogues with text script, push notification, real-time messaging from teachers and embedded Voice-Over-IP (VoIP). For the teacher administration portal, major functions included a schedules checker, teaching materials downloading, slides control and feedback submission. Secondly, the server mode consisted of a class scheduling system, a Content Management System (CMS) and Application Programming Interface (API) for the client side and a VoIP infrastructure.

A high-quality VoIP system, a real-time messaging across different devices and a robust scheduling system were three crucial components in implementing the system design. In order to quickly build a robust system, existing cloud services were utilized where possible. The CMS and API server was deployed on Amazon Web Service. Twilio and Skype with Skype Number served as VoIP service providers. The AXIS system from Englishtown was used for the backend scheduling. Moreover, UrbanAirship (4) was used to send Apple Push Notification (5) . Real-time messaging was based on Pubnub (6), where both teacher and student used Javascript based APIs.
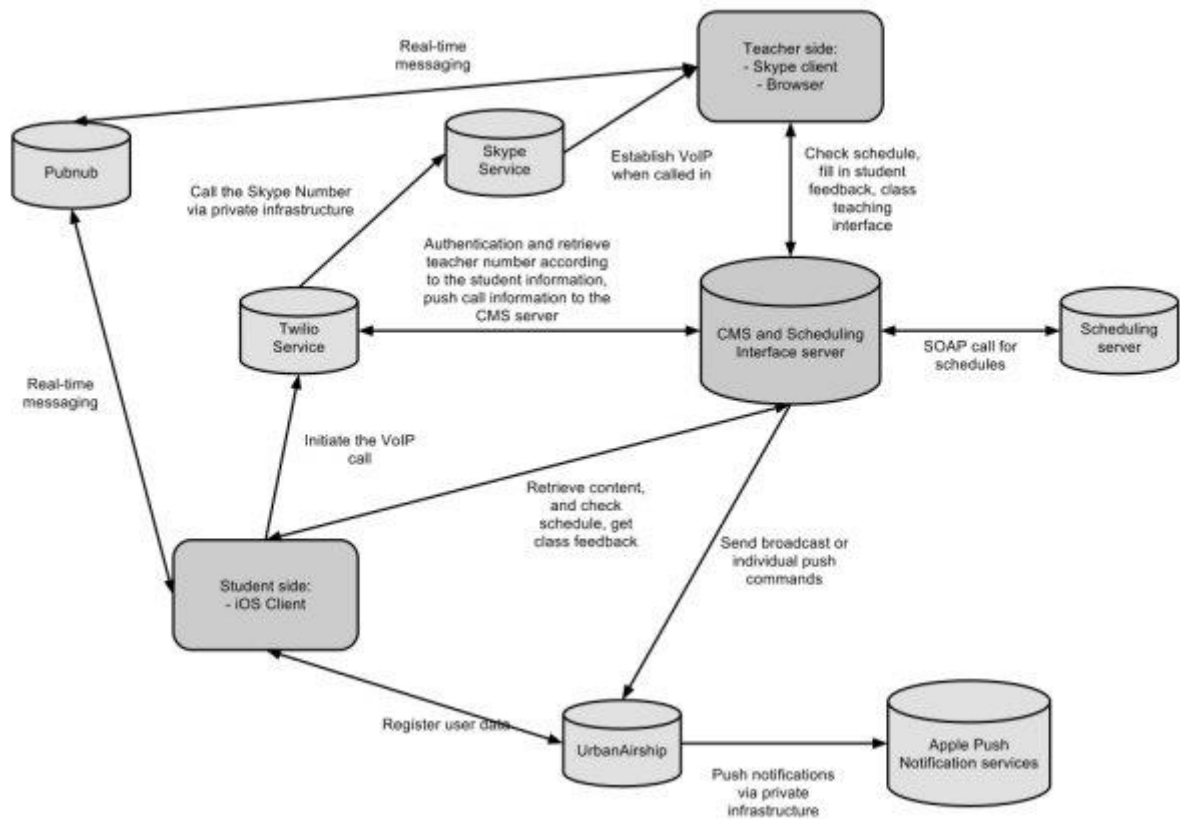
Figure 1. System diagram for Engage.

3.2. App design for Student Client

The student client was designed as an iPhone app. Apple's iOS platform was ideal for the test because of its high penetration rate among the test students' pool and its high quality of user experience. Moreover, prototyping could be implemented relatively fast with mature development tools such as XCode (7).

Students' needs were the foremost consideration in deriving the functionality of this application. The application design included a straightforward content viewing and downloading interface, an easy-to-use class booking and reminding mechanism, a clear role-play interface and an after-class review system. In addition, since native mobile applications were installed on end users' devices, it was crucial to enable users to

synchronize their progress across multiple devices and re-download the content package whenever necessary. All important user data, such as progress, teacher's feedback and download history, were stored on the server and could be retrieved at any time in the application. Students were able to receive Push Notifications when it is necessary for the administrators to send the update or error notices. The interaction flow of the app was as follows:

1. Students entered the main view after viewing the downloadable daily topic and booked a role-play class. (see Figure 2)
2. After downloading, students listened to the preparation dialogue. Sentences being played were highlighted synchronously. Students could also playback each individual sentence. (see Figure 3)
3. Students could view the sentence translation and target language explanation by tapping the sentence. (see Figure 4)
4. Going back to the main view, by tapping "Book a Role Play," students were led to the list of available time slots. Tapping one of the slots confirmed and booked the class. (see Figure 5)
5. Students were informed of the time of the class on the main view. Three local notifications were sent to the students at 1 hour, 5 minutes and 0 minutes prior to the class. (see Figure 6)
6. Students attended the role-play class by tapping "Role Play" on the main view, and were led to the role-play view (real-time teacher-controlled slide). (see Figure 7)
7. After the class, students could check the teacher feedback in the feedback view. (see Figure 8)
8. The feedback view contained: 1) Evaluation of learning outcomes, which consisted of ranking (A, B or C) of each checkpoint. 2) Teacher's comment. (see Figure 9)
9. Students could review or delete the contents, login status or view helpdesk in the settings view. (see Figure 10)

Figure 2. The main view when contents not downloaded.

Figure3. Sentences for preparation.
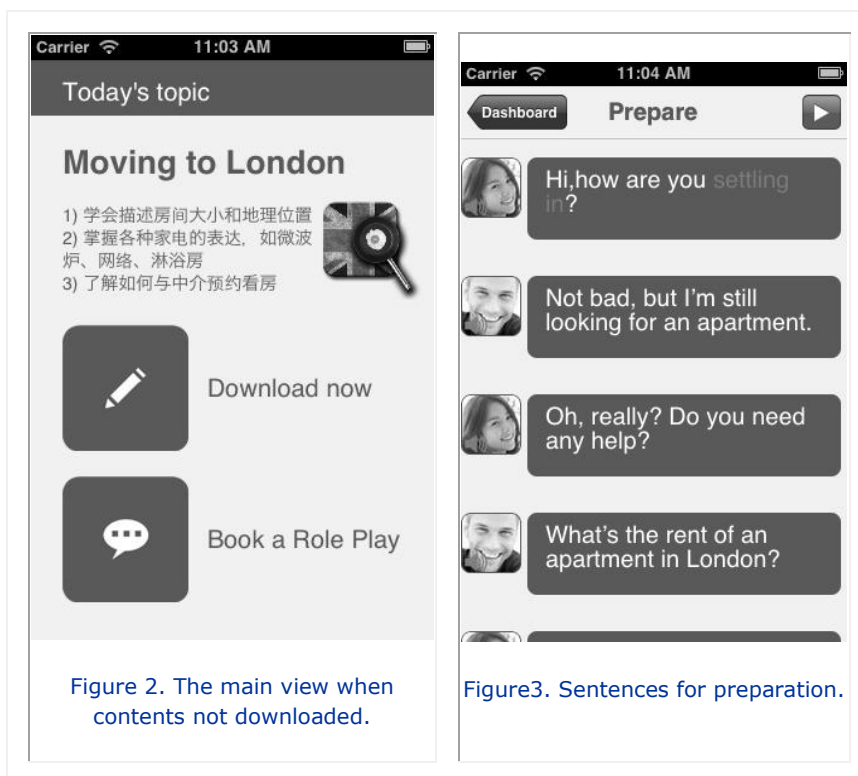
Figure 4. Translation and keywords upon tapping the sentence.
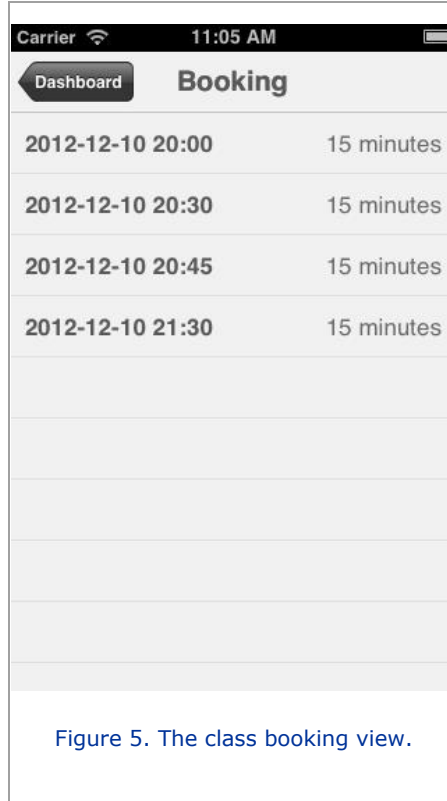
Figure 5. The class booking view.

Figure 6. The class information on the main view.
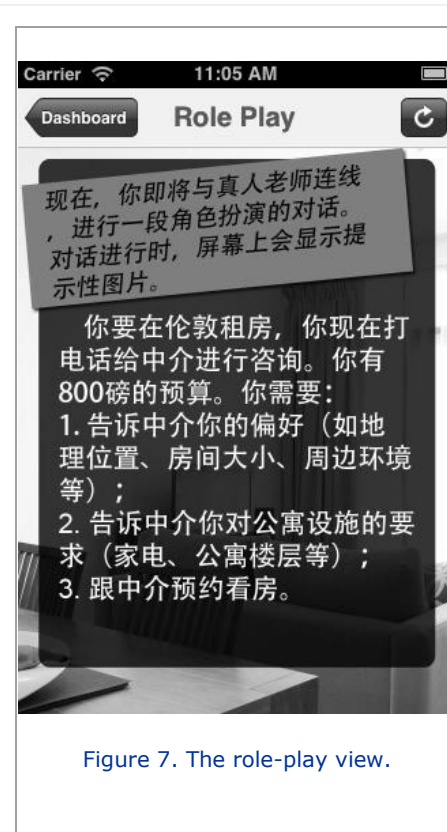
Figure 7. The role-play view.

Figure 8. Students can choose to view the teacher feedback.
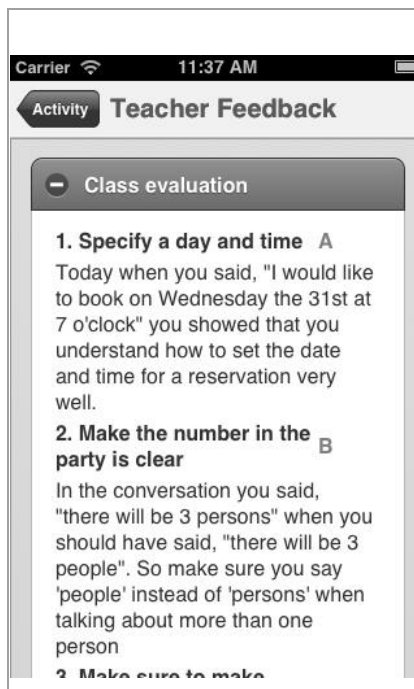
Figure 9. The feedback view.
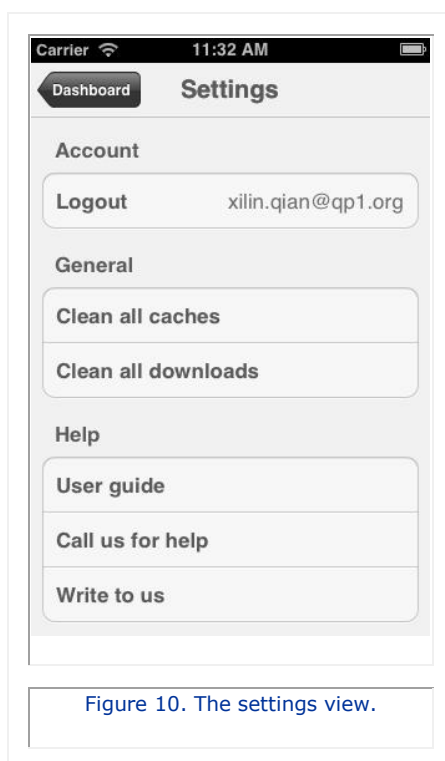
Figure 10. The settings view.

3.3. Content development

The exploration of content came along with the testing and building of the Engage product. Content development capitalized on what mobile devices can offer, that is,

flexibility and light-weight learning; and it evolved to include a closely related 2-stage learning: in the offline preparation stages, students received input on target language through preparation dialogues, which they were then asked to apply to the live role-play during the online stage. A total number of 16 scenarios were developed, covering traveling, business, and everyday topics (see Table 1):

Travel topics	Business topics	Everyday topics
Shopping at 5th Avenue Dining at Madison Square Flying to New York	Attending a job interview Rescheduling a meeting Interview at a career fair	At HSBC Moving to London Family routines Planning a party Choosing a hobby Describing people Best day of your life What were you like

Table 1. Engage topics.

3.3.1. Preparation contents

The preparation content mainly consisted of dialogues, target language, and cultural tips. In developing the content, several important considerations were taken into account:

1. All dialogues were made as authentic as possible, for example, places (hotel, restaurant, airport, location etc.), brands, TV programmes etc. mentioned in the dialogues were real-world ones.
2. Key target language (vocabulary, grammar, function, etc.) was extracted from each dialogue, accompanied by both Chinese and English explanations and sample sentences.
3. Culture tips relating to the situation were included in each dialogue. Culture tips were short introductions of conventions, knowledge of places or names, etc.
4. Considering that the dialogue prepared students for the role-play, the key target language was put in the interlocutor's scripts with which the student were going to role-play.

3.3.2. Role-playing content

The validity of using role-plays as a pedagogical strategy has been backed by numerous studies. Role-play is defined as "a simulation activity in which students are expected to take on a personal attitude, opinion, or role of someone else in a set context" (Senf, 2012, pp.3). Burke and Guest (2010, pp.34) describe role-plays as an excellent means to engage students, which emphasize "interactive, inquiry-based scholarship rather than passive learning." In order for the activities to be successful, several important elements need to be emphasized, including modelling, giving students language support, setting realistic goals, using realistic scenarios, and using realia and visual aids (Parrish, 2004).

The role-playing contents in Engage were designed to be closely aligned with the preparation content. For each topic, the role-playing content consisted of the "Task description," "Checkpoints," and "Cue images."

First, the "Task description" provided essential background information on the topic and set the "task" which students were asked to complete by the end of the role-play. For example, in one topic, "Moving to London," students were asked to request information

from a local agency on apartment rental and make decisions within a budget limit. Second, "Checkpoints," as the name suggests, was the prescribed "pathways" the role-players were required to follow. The use of checkpoints served two purposes: firstly, as checkpoints corresponded to the conversation flow in the preparation dialogues, they gave the students a layer of support as to what exactly they were expected to talk about; secondly, the checkpoints helped to set standard 'tracks' the role-play should follow, thus preventing the conversation from going off topic. The checkpoints for "Moving to London," for example, were:

1. Tell the agent your preference (location, room size, environment, etc.);
2. Tell the agent what facilities and home appliances you require;
3. Make a reservation with the agent to view the apartment.

Each checkpoint corresponded to one or two "cue images" where the student was shown essential information they were expected to talk about. Most of the information also corresponded to the key target language. For example, in talking about home appliances, images such as a microwave and a refrigerator were shown to the student. Icons and symbols were used to represent abstract concepts such as "location" and "budget."

Cue images added another layer of support for the students. They helped to establish a link between English words and visual stimuli. The internal tests revealed that students were often focused on phrasing during the live role-play; and therefore they were often unable to pick up vocabulary from text notes provided for them while they were speaking. During the first couple of internal tests where text notes were provided, the students commented that their minds were "too focused on phrasing English sentences," and therefore they were not able to check the text notes during the session.

In the internal tests where cue images were used to replace the text notes, it was found that cue images were useful not only in guiding students in conversation, but also in increasing students' retention of key vocabulary learned through preparation dialogues. The technique of using visual connections for words has been backed by literature (Sousa, 2006; Buzan, 1989; Hyerle, 2004). Cue images were made in order to elicit students' memory of a specific vocabulary. For instance, during the internal tests of the topic "Renting an Apartment in London," when talking about requirements of home appliances, almost all students could recall the target language vocabulary of microwave, refrigerator and cable TV. Students commented that they could recall these words because these images reminded them what had been taught in the preparation dialogue. Post-study interviews also revealed that cue images which gave "cues" on target language expressions were more useful than "background" images such as a photo of a restaurant or a shopping mall. However, not every piece of target language could be "translated" into cue images, for example, abstract words or expressions such as "agent" and "look for."

All content was written by native speakers and edited by professional editors with experience in language teaching. Dialogues, key target language, sample sentences in the explanation of key target language were all pre-recorded by voice actors. Environmental sound effects such as background noise and telephone ring tones were also added in the post-production in order to make the scenarios as real as possible.

4. Valid learning experience and production feasibility

The designed learning experience has been proven valid for English learners. During the external test, 46 students successfully completed the entire learning experience: installing the application from App Store, downloading the content, preparing the dialogue to conducting the role-play and receiving teachers' feedback. The learning concept was well-received; 37% (17 out of 46) students attended the role-play task

more than once; the 21 collected survey responses averaged 9.6 on a 10-point scale (1 to 10) on the overall satisfaction rating; 57% of surveyed students said they wanted to practice the same task again. Students also showed interest in purchasing this learning experience: only 2 out of 21 respondents stated that they would not buy the full version if this application release.

Content was also well-received. Eleven rated topics received an averaged rating of 4.52 (out of 5). Role-play tasks received an average rating of 4.63 (see Table 2).

Topic	Topic	Role-Play Task
At HSBC	4.78	4.98
Attending a job interview	4.33	4.87
Choosing a hobby	4.97	4.90
Dining at Madison Square	4.63	4.39
Family routines	4.50	4.45
Flying to NY	3.50	4.87
Interview at a career fair	4.44	4.14
Moving to London	4.92	4.90
Planning a party	4.58	4.68
Rescheduling a meeting	4.51	4.49
Shopping at 5th Ave	4.58	4.29
Mean	**4.52**	**4.63**

Table 2. Ratings of each topic.

In terms of technological feasibility, the application and system architecture design have been successfully tested. All students were able to access teacher feedback, receive alerts of reminders and administrator's notification and operate normally on any designed functionalities at any time. For class booking, AXIS streamlined the scheduling process for both teachers and students; students reported no obstacle in booking a class and receiving alert messages. Second, no case of voice delay was reported during the interviews. In the external tests, the delay was less than one second in both the 3G and Wifi environments (China Unicom 3G and China CNC network). However, sound quality issues were reported by a small proportion of the students. Possible causes were problems with network bandwidth and settings, quality of the internet service providers and other technical interruptions. Third, in interviews and surveys, students reported no problems with viewing visual cues as they were switched.

The usability of the student client application has also been successfully tested. Embedding the VoIP proved to be a great improvement in the user experience. In internal tests, because calls were handled by telephone after the role-play phone call, which was carried outside the application, students had trouble switching back to the application by manual operation (8) . However, this problem was resolved in the external tests by embedding a VoIP functionality in the application.

A straightforward cost model was derived from the external tests where the cost of the service was proportional to students' usage. Specifically, on the technical side, Twilio service cost was measured by the minutes used; Skype number was subscribed

individually. AWS was charged by computing power and time consumed; Pubnub and UrbanAirship were charged by messages sent. Since all technical solutions were deployed on the mature cloud and billed according to usage rate, the service was easy to scale. In terms of the provision of teaching resources, administrators were easily able to allocate teaching resources (measured in teaching hours) in the AXIS scheduling system according to the demands for the class.

5. Conclusion

Engage has proven to be a successful first step toward connecting a real teacher and a student in real-time via mobile devices. The two-step learning experience consisting of the offline preparation and online synchronous role-play was proven to be a valid learning experience, shown by students' usage, ratings, survey and interview findings. Through the external test, the feasibility of operationalizing this product has also been proven.

The development of this application also served as good testimony to the usefulness of the iterative approach, where users are invited to participate in cyclical tests and developers quickly respond to their feedback and make changes or tweak the system accordingly.

However, the concept of real-time mobile-based role-play for language learning still needs to be further explored. In our current version, students were only allowed to role-play one of the interlocutors; in future versions, students should have the flexibly to choose their roles. The peer role-play model may be a possible low-cost alternative, compared with the current model where a real teacher is used, if the demand for classes goes up dramatically. However, in a peer role-play model, issues such as student matching and scheduling need to be addressed.

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Notes

[1] EF Labs, the R&D centre associated with Education First.

[2] EF English centres are the affiliated teaching centres of Education First.

[3] The client-server model is a distributed application structure in computing that partitions tasks or workloads between the providers of a resource or service, called servers, and service requesters, called clients. http://en.wikipedia.org/wiki/Client–server_model.

[4] UrbanAirship is a cloud based push notification provider.

[5] Apple Push Notification Service allows third party applications to send push messages to end users through APIs from Apple Inc.

[6] Pubnub is a real-time message publish and subscription cloud service.

[7] Xcode is set of tools from Apple to develop and tune iOS and MacOS applications.

[8] In iOS, the switch of application can be triggered by one application calling the other app programmatically or double tapping the Home button manually.

Article:

Electronic Feedback: Pedagogical Considerations for the Implementation of Software

Miguel García-Yeste
Centre for Academic English, Stockholm University (Sweden)

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miguel.garcia@english.su.se

Abstract

As university lecturers, we often struggle to provide our students with good quality feedback in a consistent manner. This is usually caused by the increasing imbalance in teacher-student ratios (Hounsell et al., 2008), as well as the pressure of academic life and the lack of time (Sadler, 2010). In addition, assessment practices should be transparent enough to ensure all students are evaluated in a similar way (O'Donovan et al., 2004), especially when different instructors teach different groups of students taking the same course. This paper, which focuses on designing a feedback scheme that helps instructors to provide good quality feedback in a consistent manner, begins with a needs analysis based on the author's experience as an instructor of academic writing in English. A literature review follows, focusing on: (a) the scholarship on feedback in higher education; and (b) the research on the use of technology for the provision of feedback. Finally, a feedback scheme is presented, and some guidelines for its implementation are provided.

Keywords: Formative feedback, literature review, electronic feedback, software, self-regulation.

1. Introduction

It is generally accepted that "although student numbers have risen substantially over the past quarter-century, staff to student ratios have halved" (Hounsel et al. 2008, p. 56). This imbalance in the student-teacher ratio means that instructors often have to read and comment on a considerable number of assignments. The problem is particularly acute in the case of writing courses, in which students are usually required to produce written assignments on which they receive feedback. This situation has been reported in a number of studies (e.g. Hyland, 2003) as having negative effects on the feedback students receive.

Drawing on my own experience as an instructor of academic writing, I have noticed that in each batch of papers I grade, I tend to give more feedback on the first texts I read. I have also noticed that the quality of my comments varies depending on a number of contextual factors. For example, if I am tired or if I have written the same or very similar comments several times, the level of detail in my feedback is affected. This tension between the teacher's desire to provide effective feedback and the lack of resources (e.g. time) has been reported in the literature. For instance, Sadler (2010) points out that "the desirability of feedback cannot be separated from the practical

logistics of providing it […] feedback should not only be of an appropriate type but also be provided within the available resources, especially time for academics to give feedback to individual students" (p. 536).

Besides the unfairness of the situation described above, nowadays we are expected to employ assessment methods that are "transparent and demonstrably known and trusted." (O'Donovan et al., 2004, p.326). This is of particular relevance when more than one teacher is involved in the assessment process. A review of research findings carried out by Hounsell (2003, cited in Hounsell et al. 2008), indicated that the feedback received by students across the UK was reportedly multifarious in quantity and helpfulness. In that sense, I can trace these issues in some of the courses I teach, since different groups within the same course have different teachers and, even when we all share the same grading criteria, the feedback students get can, at times, vary significantly.

2. The problem

In this situation, the need arises to find a system that: (a) enables instructors to provide good quality feedback so as to support the development of students' self-regulation; (b) helps teachers produce and deliver feedback in a consistent manner; and (c) facilitates replicability so the system can be used by more than one teacher. In the present paper, I aim to plan the implementation of a written text correction programme for an academic writing course in English, taught in a higher education context. This implies developing a usable protocol for the teachers, and designing "good feedback" leading to self-regulation for the students.

So as to address need (a), I intend to refer to the literature describing an "effective provision of feedback" (Nicol, 2006, p.590) in order to reflect on what the literature identifies as *high quality feedback*. I aim to design effective ways to provide my students with feedback that will help them learn independently and in a self-regulated manner. In relation to needs (b) and (c), consistency and replicability, I have decided to explore the implementation of written text correction software. Some voices claim that information and communications technologies (ICT) might be able to contribute to the role of feedback in helping students achieve self-regulation (e.g. Cabero, 2001; Mooij, 2009; Nicol, 2006). Thus, I aim to identify a programme with functions that support the needs elicited in the selected context.

3. Literature review

In this section, I review the relevant literature in relation to the issues directly connected to this paper's aim: (a) studies on the design and provision of effective feedback on written performance, and (b) studies on the use of ICT for formative assessment and feedback.

(a) Studies on the design and provision of effective feedback on written performance

Since the context for this project is a range of courses in academic writing in English in which most students have English as a second language (ESL), the research on feedback on second language writing and academic writing is of relevance.

Hedgcock and Lefkowitz (1994) address two questions with potential implications for this paper, namely: (a) How do ESL students react when they receive feedback from their teacher? and (b) How do these reactions affect the evolution of the students' perception of text quality and their composing processes? In the same paper, the authors explore whether students of English as a second language (ESL) and students of English as a foreign language (EFL) differ systematically in terms of self-appraisal patterns and responses to feedback; however, this question does not relate to the

present study because, even if those categories are probably relevant in the context of the study reported by Hedgcock and Lefkowitz, such distinctions do not seem to hold much value in my current context.

In relation to the different types of feedback the researchers analysed, and to how these were perceived by students, Hedgcock and Lefkowitz (1994) state that "many teachers act principally as evaluators rather than as collaborators or as willing recipients of the information students are expected to communicate" (p.143). Quite often this situation results in feedback being more judgemental than constructive in relation to the student's paper. This is especially troublesome in those cases in which the feedback is provided not *during* the writing process, but *after* the completed piece of writing has been submitted. In such cases, it seems obvious that the space left to the students for reaction and improvement is quite limited; they are merely passive recipients of an *expert's opinion*. In this sense, my intention is to come up with feedback that helps my students to improve their current performance. In fact, the idea is to comment on the first draft of their paper. I argue that, by framing the feedback within the process of essay writing, both teachers and students will be able to see feedback as an aid in the construction of the final version of the essay, rather than as a value judgement passed on the finished product.

Beyond the question of *when* feedback is provided, the previous ideas have implications around the basic functions of feedback in terms of cognition, namely that of nourishing students' problem-solving and critical-thinking abilities (Cumming, 1989). In fact, when Hedgcock and Lefkowitz (1994) consider how students internalise feedback, they suggest that students tend to identify those aspects their teachers comment on as being more important than other things that did not merit a comment. This indicates that students attribute salience to the issues brought up by their teachers, which in turn implies that instructors should consider carefully which features are mentioned in their feedback, as opposed to commenting on *everything*. These findings become particularly significant when considered in connection to some of the claims found in the literature suggesting that the amount of feedback students can process and react to is rather limited. For instance, Nicol and Macfarlane-Dick (2006) argue that students can only internalise three comments for each assignment. While the present project does not intend to determine exactly how many comments students can process, the students' capacity to assimilate and respond to comments is certainly relevant.

The next logical step is then to decide what aspects are worth commenting on. In that sense, Nicol and Macfarlane-Dick (2006) remind us of Sadler's three conditions necessary for students to benefit from feedback, namely that they need to know: (a) what good performance is; (b) how current performance relates to good performance; and (c) how to bridge the gap between good and current performance. In order to help teachers to design effective feedback, Nicol and Macfarlane-Dick (2006) suggest seven principles in light of Sadler's three conditions. The overarching idea behind the seven principles as presented below is to highlight the relevance of providing "well-thought-out comments" as well as ways to improve performance.

1. Helps clarify what good performance is (goals, criteria, expected standards);
2. Facilitates the development of self-assessment (reflection) in learning;
3. Delivers high quality information to students about their learning;
4. Encourages teacher and peer dialogue around learning;
5. Encourages positive motivational beliefs and self-esteem;
6. Provides opportunities to close the gap between current and desired performance;
7. Provides information to teachers that can be used to help shape teaching.

Table 1: Seven principles of good feedback practice (Nicol and Macfarlane-Dick, 2006).

It seems feasible, then, that the implementation of a computer programme that allows creating and managing a database of comments could assist teachers in the provision of these so-called "well-thought-out comments". The idea is that the comments in the database would target at least some of these seven principles on a number of levels. First, the comments would help to clarify what good performance is by providing access to examples of desired performance (principle no.1). Second, the comments would facilitate the students' development of a reflective attitude towards their own work; rather than indications of good/poor performance, the comments would provide explanations that would help students understand why their text was not effective (principle no.2). In addition, because these comments would be stored in a shared database, several teachers would spend time designing them cooperatively; this would probably increase the quality of the information delivered to students (principle no.3). Because students would have access to samples of desired performance and to information about why their performance was not effective, the opportunities to close that gap would be enhanced (principle no.6). Finally, if the software offered the possibility of showing common problematic areas across students in a group, teachers would be able to address those specific issues in their teaching (principle no.7); in fact, if different teachers compared which areas were problematic in different groups, measures could be taken at syllabus level.

Principles 4 and 5 are harder to address through an action plan as the one presented here. However, because the feedback would be given *during* the writing process, time for teacher-student interaction, such as tutorials, could provide opportunities to discuss feedback. This would address principle number 4. As for encouraging positive motivational beliefs and self-esteem, the whole experience should be designed so as to empower students and to encourage them to become independent, self-regulated learners. Ultimately, they would feel in command of their learning processes and reinforce their motivation and self-esteem. The degree to which the implementation of this electronic feedback affects individual students would, of course, depend on several psycho-affective factors that fall outside the scope of this paper. However, the provision of effective electronic feedback would provide some support in this direction.

On to a different issue, I would like to close this section on effective feedback by referring to the benefits of using exemplars of desired performance. In that sense, Sadler (2010) problematises the view of *feedback as telling* and suggests that this may not always be the best way to provide feedback. In his view, showing and guiding towards discovery may be more appropriate instead. One of the reasons he uses to support his argument is connected to the amount of shared knowledge between teachers and students, as he highlights in the following quote:

> [R]egardless of levels of motivation to learn, students cannot convert feedback statements into actions for improvement without sufficient working knowledge of some fundamental concepts. Teachers who compose feedback obviously possess and draw on a working knowledge which embraces these concepts. (Sadler, 2010, p.537)

As the reader may see, Sadler emphasises the role of tacit knowledge as defined by Perkins (2007, p.39), and how it can sometimes represent a threat to clarity in teacher-student interaction. In fact, Polanyi (1962; in Sadler, 2010) points at the lack of tacit knowledge as one of the challenges experienced by students when facing teacher feedback. This is a potential issue in the feedback I provided my students with, since more often than not being a skilful writer is connected to being familiar with what McCune and Hounsell (2005) call "ways of thinking and practising", i.e. ways of writing in a specific discipline. Therefore, in the area of academic writing providing samples for

students to look at may be particularly crucial. This may be a good strategy to "not only providing constructive and timely feedback comments, [but also] assisting students to come to hold a conception of what counts as good quality work in the subject area" (Hounsel et al., 2008, p.55). As a consequence, one of the priorities in choosing a computer programme here will be its ability to incorporate access to exemplars.

(b) Studies on the use of ICT for formative assessment and feedback

Another relevant area of research for the purpose of the present paper is that of the use of ICT for formative assessment and feedback. In particular, two main issues need to be explored, namely: the ways in which ICT and assessment can be integrated and how this affects the participants involved in the process (i.e. teachers and students); and the reviews of the programmes available at the moment. Thus, this section presents some of the interesting ideas reported in the literature.

In relation to integrating ICT in the assessment process, there seem to be two schools of thought. On the one hand, some systems provide automatic feedback and writing assessment, which reduces assessment time dramatically. Nevertheless, Ware and Warschauer (2006) highlight that these systems bring along the danger of presenting writing as a mass product designed to pass a quality test, rather than to communicate or to interact with a specific audience. Obviously, this approach is very problematic in all kinds of writing; furthermore, in the case of writing for academic and/or specific purposes, considerations of audience, author, context, and purpose become central to the process, since these concepts determine core aspects such as content, style, structure, etc.

As an alternative approach, several studies (e.g. DiGiovano and Nagaswami, 2001; Tuzi, 2004) refer to the idea of *electronic feedback* in reference to feedback provided by a human being through technology. In fact, Tuzi (2004) explores the differences between traditional, pen-on-paper feedback and electronic feedback, and concludes that when electronic feedback is used: (a) students make more revisions on the original text; (b) they stay on task for a longer period of time; and (c) the changes they make are mostly at the macrolinguistic level (e.g. paragraphing, essay structure), which, in fact, requires a deeper understanding of the concept of genre and demonstrates a more advanced command of the writing process. This last aspect is very interesting as, even though students in Tuzi's study reported that they preferred oral feedback rather than written feedback, e-feedback seemed to trigger more revisions. Some of the students interviewed by Tuzi commented that their awareness of audience was greater, and that they were more willing to revise their papers when they perceived their intended message would not be conveyed effectively. This connects with the idea of using feedback as appraisal of communicative effectiveness, rather than as judgement as mentioned in the previous section.

Furthermore, in relation to written feedback DiGiovano and Nagaswami (2001, p.268) suggest that "teachers can monitor students' interaction much more closely than in face-to-face situations, where only bits of conversation can be heard as they circulate among peer dyads". This is idea can be connected to principle no.7 in Nicol and Macfarlane-Dick's model, as being able to monitor the interaction allows teachers to spot problematic areas and misconceptions as they arise, and to tailor teaching to student needs.

Interestingly enough, Case (2007) identified a somewhat problematic issue in relation to the use of ICT and the need to adapt teacher action to student needs. In his study, Case tests the use of a feedback script that was, in turn, fed from a bank of electronically stored comments. One of Case's main goals is to save time and effort which, in turn, is meant to alleviate labour and cognitive demands on the side of the teacher. However,

one of the common comments regarding this type of procedure he encounters is that *canned feedback* becomes highly depersonalised. The author addresses this issue in the following manner:

> *Although staff can be resistant to the use of such banks for fear of lack of personalization of feedback comments, there is evidence to suggest that students themselves prefer this slightly more mechanistic approach as it provides them with a substantial amount of information on performance (in this case, directly relevant to learning outcomes and assessment criteria), which can then be supplemented with idiosyncratic comment on the script.* (Case, 2007, p.289)

Thus, one of the features aimed at in the feedback scheme reported in this paper is to find a tool that allows the creation of a feedback bank, as long as the comments can be fine-tuned to fit specific texts. In order to decide on a programme, the literature assessing software available as well as their usability and practical issues is considered.

One of the earliest papers on this topic is Holmes' (1996) report on how he developed a basic programme, *Markin' ©*, to produce written feedback. In his paper, the author includes a section on advantages of e-feedback over conventional feedback including: (a) it is more readable than handwritten comments on the margin; (b) the system forces the teachers to be more consistent in diagnosing and classifying the type of issue; and (c) the system is faster once it is in place. Despite being fairly dated, Holmes' paper provides a general picture of the whole process of using this kind of software, and brings up some practical difficulties faced by the author himself when using the programme.

Bearing in mind Holmes' experience, two more papers are considered, i.e. Krajka (2002) and Thomas (2004). Both authors examine the process of providing electronic feedback with *Markin'©* software. While Krajka (2002) compares the use of *Markin'©* to the use of *Microsoft Word©*, Thomas (2004) takes a broader approach, and evaluates word processors, *Markin'©*, *Wincorr©*, and web-based tools, such as *Bonito* and *Just the word*. After reading both reviews, I would argue that using the change tracking function in *Microsoft Word* actually involves changing the student's piece of writing; this may interfere with the students' development of their own authorial voices, which may be counterproductive.

In addition to computer programmes, the possibility of using web-based resources is contemplated. Their main appeal is the fact that they are available anywhere, as opposed to installing software in a specific computer, limiting when and where assessment can be done. However, this option raises issues of ownership. Web-based tools seem to work in combination with online repositories, and obtaining clear information regarding privacy can be extremely difficult.

4. Planning electronic feedback

In light of the literature on software available and after thinking about the features required by the context of this paper, *Markin'©* (see Fig. 1) has been selected. As mentioned above, *Markin' ©* is a computer programme developed by Martin Holmes to help teachers correct their students' writing, while leaving room for teacher action. From the wide variety of existing programmes, the latest update of *Markin'©* has been selected because it does not correct texts automatically, as other programmes do, but allows teachers to make decisions in the process. Thus, the software does not assess the texts automatically, but offers several tools that facilitate the process of giving feedback through pre-set annotations and databases of frequently used comments. The only automatic feature of the programme is that, based on the teacher's criteria, it can

be asked to calculate a grade on the pieces of writing. This feature may be useful in some situations, although the present study focuses on the programme's use for the provision of formative feedback. In the following paragraphs I present some characteristics of the programme, namely its default and customisable buttons, and the teacher comments database function. For detailed descriptions of the software see Krajka (2002), Thomas (2004), Alesón et al. (2006), or the developer's website (http://www.cict.co.uk/markin/index.php).
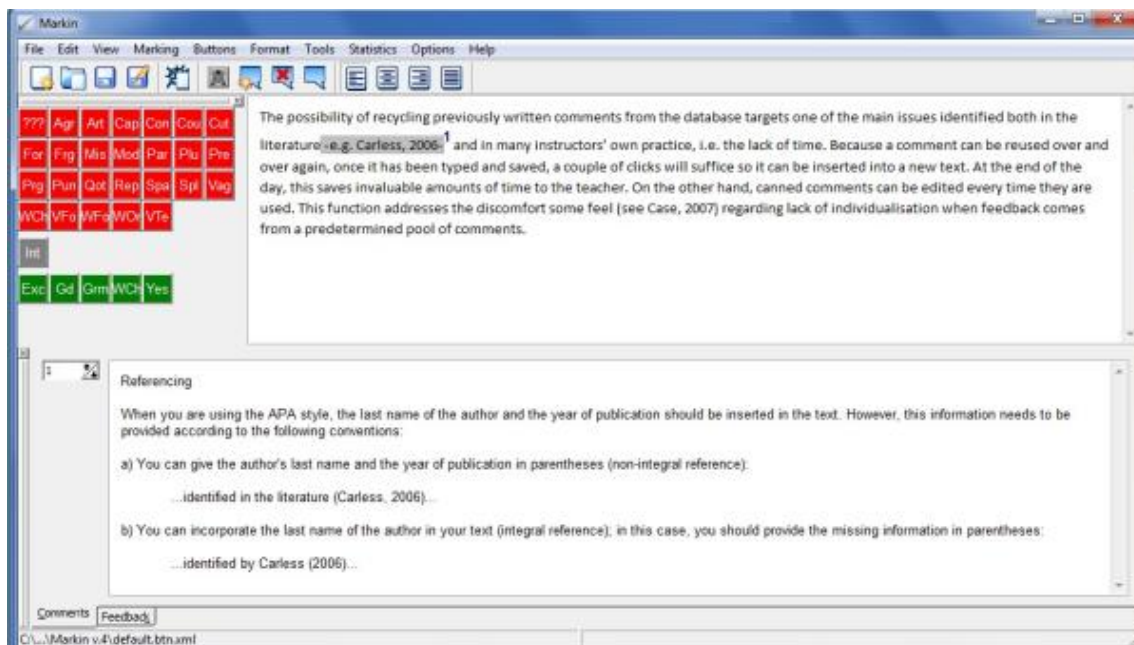
Figure 1. The programme's interface.

Markin'© has an annotation tool, referred to as *buttons* by the programme's developers (see Figure 2), that can be used to tag fragments of text according to predetermined categories. These categories can be adapted for each specific assignment, so that they tag aspects that are relevant for the assignment's intended learning outcomes (ILOs). The most straightforward use of the programme's buttons is that of classifying textual and grammatical aspects, both positive and negative. In other words, the buttons can be used to indicate an instance that is problematic in the text (e.g. an instance where subject-verb agreement is problematic, as in *Mary and her sister comes every day*), but also to praise an effective use of language (e.g. an effective word choice).
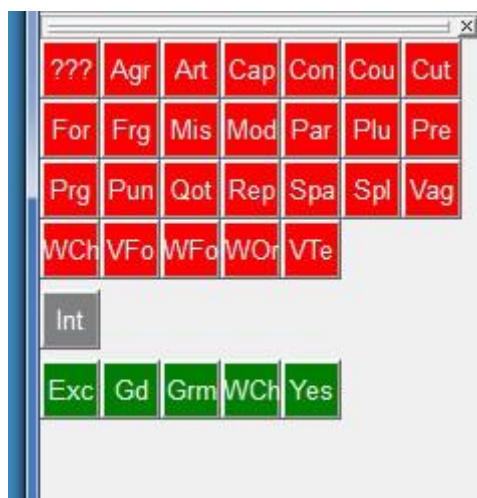
Figure 2. Image of the programme's buttons.

Obviously, the use of the buttons does not provide more information other than the identification and categorisation of particular issues. It is then up to the student to find out what the problem is, and how to fix it. Pointing out problematic instances but not offering a specific way to solve them can be beneficial on a number of levels. To begin with, it may support autonomous learning, since students are prompted to investigate how to improve their texts. In addition, this strategy empowers the students as authors, letting them decide how to (re)write their texts in ways they feel comfortable with; ultimately, this might help them to develop their own voice as authors.

On the other hand, the programme has a tool to insert in-text comments (see Figure 3). These comments may include detailed explanations, examples, sample answers, links to online reference material and exercises, etc. External resources may be able to provide the extra support some students need in a manner that may foster their independent and self-regulated learning. In addition, the possibility of including fragments from real texts or links to exemplars would provide students with opportunities to engage with real texts; this is a way to tackle the amount of tacit knowledge involved in the development of writing skills as presented by McCune and Hounsell (2005, p.257).
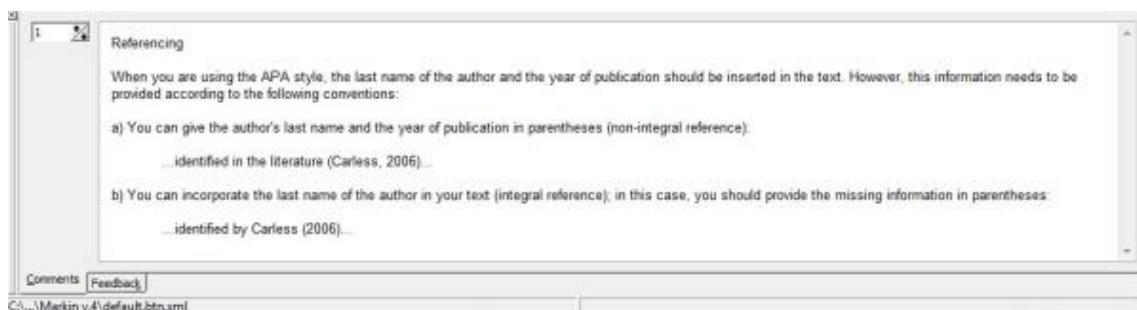

Figure 3. Comments area in the programme's interface.

In addition, the comments can be stored in a database so they can be reused in the future; every time a comment is used, it can be edited to connect with the specific text. In this sense, Markin'© caters for feedback that is "both specific (referring, as it necessarily does, to the work just appraised) and general (identifying a broader principal that could be applied to later works)" (Sadler, 2010, p.538). The possibility of recycling previously written comments from the database targets one of the main issues identified both in the literature (e.g. Carless, 2011) and in many instructors' own practice, i.e. the lack of time. Because a comment can be reused over and over again, once it has been typed and saved, a couple of clicks will suffice to insert it into a new text. This saves invaluable amounts of time for the teacher.

On the other hand, canned comments can be edited every time they are used. This function addresses the discomfort some feel (see Case, 2007) regarding lack of individualisation when feedback comes from a predetermined pool of comments.

A further advantage offered by Markin'© is that both the customised buttons and the comments database can be shared by different users of the programme, which allows for several teachers to use the same buttons and comments when they grade students taking the same course. This feature should increase the assessment's consistency and reliability, as well as its transparency and demonstrability, all of which are issues of increasing relevance in contexts of higher education (O'Donovan et al., 2004, p.326). In addition, the use of the comments database in combination with the in-text comments and the general comments tool should allow teachers to give more comprehensive feedback, which might in turn provide extra scaffolding for the students who need it. Moreover, this tool may also homogenise the comments students receive for a specific assignment in terms of length and level of detail.

5. Final remarks

This paper has tried to bring together the literature on feedback practices and the design of electronic feedback schemes. An academic writing course has been used as sample context for the implementation of one such system, and a computer programme has been identified as meeting the relevant criteria. The selection of the software is based on the fact that it offers functions that match the needs identified in the first part of the paper.

In the case described here, implementation occurs on a series of steps. First, the group of instructors agree on an assignment to test the programme on, and have a meeting in which buttons and comments are designed. For this phase, experience from previous terms helps to elicit problematic areas in student papers. After that, the buttons and comments are saved in each teacher's computer and used when giving feedback to students. Afterwards, another meeting is held to evaluate the experience. The final step is to consider the final versions of the students' papers across groups and to compare them against papers from previous terms to check whether positive effects can be observed.

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Article:

Issues in Integrating Information Technology in Learning and Teaching EFL: the Saudi Experience

Yousef Hamad Al-Maini
College of Languages & Translation, Imam University (Saudi Arabia)

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yalmaini@yahoo.com

Abstract

The Saudi education system is facing a climate of change characterized by an interest in integrating new technology and educational approaches to improve teaching and learning. In this climate, the present paper explores the issues in integrating information technology in learning and teaching English as a foreign language (EFL) in government intermediate schools in Riyadh, the capital of Saudi Arabia.

The background to information technology use in Saudi education is introduced, with specific reference to the *Watani* project for integrating computer and internet use into educational administration and teaching. Taking an interpretive approach, the author offers insights into the current status and use of Information and Communications Technologies (ICT) facilities in the two intermediate schools. A discrepancy is found between intention and practice. Issues are highlighted that contribute to the failure to exploit fully the potential of ICT: teacher resistance, lack of training and budgetary or resource constraints.

The author concludes that the wider exploitation of information technology in learning English, supported by appropriate training, could benefit both students and teachers and offers recommendations for its implementation.

Keywords: English as a foreign language, ICT integration, Saudi Arabia

1. Introduction

In the education domain, Information and Communications Technologies play a significant role in improving the quality of the teaching and learning process by enhancing teacher training, motivating learners and facilitating the acquisition of basic skills (Tinio, E-ASEAN Task, and UNDP Asia Pacific Development Information Programme, 2003).

The power of ICT to improve education is vast, many writers and educators argue (Atkinson 1998; Eastment 1999; Williams 1999). Saudi Arabia is keen to adopt this technology in its education system. The government's commitment to modernizing and enhancing educational administration, as well as the teaching and learning process, by exploiting the benefits of this technology, was expressed in 2000 in the introduction of the *Watani* project to equip schools with computers and link them in an integrating network. Fourteen years on, however, the intention of the project is far from being realized, as this paper will show. In order to take advantage of ICT, educators and

planners need to consider a few essential issues. Teachers may be reluctant to espouse new methods and technologies for a variety of reasons including entrenched habits, difficulty in incorporating new methods and materials into a tight and overloaded schedule, and lack of confidence and/or competence in using technology and integrating it into classroom activities. There may also be difficulties at the individual school level caused by budgeting constraints and inadequacy of resources in relation to the number of students.

2. Background

Communications technologies have come to play a very important role in shaping education, not only in developed but also in developing countries (Al-Showaye 2002). However, as policy makers and those trying to implement the use of ICT point out, some major difficulties are encountered (Al-Showaye 2002). Teachers' familiarity with information technology is often too limited to give optimum outcomes and results. Al-Agla (2002) reports the following causes: resistance towards ICT, non-existent or limited participation in in-service training courses or developmental tasks, resistance to teamwork in the school and perceptions of 'teaching' being a one-way communication system, i.e. teacher to student.

In early 2000, Crown Prince Abdullah announced the *Watani* project, an ambitious national project to incorporate computers (1 per 10 pupils) and the internet into school classrooms and lessons (Saudi Press Agency 2000). The *Watani* project also aims to link Saudi Arabia's schools with an integrated network, enabling the Ministry of Education to contact all its schools and education departments around the Kingdom (Saudi Information Resource Centre 2000). The project master plan (Watani 2007) highlights the impact of globalization and the need, in the 'Information Age' for young Saudis to be equipped for a future that depends heavily on computers, in order to play their role in national development and international economy.

The project is planned in four phases: phase 1, design of network and trial project in a few schools; phase 2, extension to half the Kingdom's schools; phase 3, completion of linkage; phase 4, follow-up, maintenance and upgrading. When complete, Watani is intended to provide students and teachers with educational references, e-books, teaching guides, syllabuses, series for students with special needs, multimedia, teacher training materials, school management systems and a Question and Answer bank.

3. The present study: context, methods and participants

What follows is based on an interpretive, qualitative study carried out in Riyadh, to explore the teaching of English as a foreign language. One of the issues investigated was the availability and use of ICT. An intensive case study was carried out in two state intermediate schools containing 500 students, aged 12 to 15 years, distributed in three years or grades and 20 classes. Class sizes varied from 25 to 28 students. The head-teachers, all six English teachers and more than 100 students were interviewed, and 18 classroom observation sessions carried out, covering all three years of study. Visits were also made to three other intermediate schools in the city, and interviews conducted with a further eight English teachers.

4. Status and use of ICT facilities

The case study schools each had a Learning Centre (LC) containing eight circular tables and a computer connected to a data projector. For example, with thirteen classes in the first school, and thirty-three lesson periods in the school week, in theory, each class might be able to use the LC twice a week. However, such access would be spread across the full range of academic subjects. In practice, therefore, it would be difficult for

English teachers to use the LC regularly. One teacher, for example, reported having to wait two weeks for an opportunity to take a class to the LC.

If a teacher succeeded in booking the LC, in practice, the computer was used as an aid to enhance the communicative approach to language learning. In one lesson observed, for example, students were asked to listen to conversations between students and teachers in the UK and USA, then asked about vocabulary featured in the conversation and drilled in pronunciation. A particular focus was on verbs previously studied in class, producing clear linkage between work in the LC and other lessons.

The author's experience in intermediate government-run schools indicates that, while computers and internet access have been installed, the current focus is on their use in administration, rather than teaching. Schools in Riyadh were observed to be exploiting computer facilities for storing examination and assignment marks, for example; these could then be printed out at the end of the semester or end of year, and sent to parents in the students' reports. Moreover, e-mail has to a great extent replaced paper communication in dealings between the schools and the district or national education authorities, greatly speeding communications.

For teaching purposes, most schools have a Learning Centre (LC), generally equipped with at least 15 computer desks, in which in theory classes can be taken for any subject, although it is necessary to book a slot to use the room. Competition for access may be great. It should also be pointed out that some schools do not benefit from purpose-built buildings, but are in leased premises –an unsatisfactory solution to the problem of rapid expansion of education– and in such cases, there may be no LC, computer laboratory or similar facilities available.

The benefits of using modern technology in teaching English were clearly recognized by one of the English teachers interviewed. He had initiated what he called an "English Lab" in his intermediate school. That lab contained a laptop and over-head projector, which he had paid for himself. In another lesson observed, the teacher, a trainee on teaching practice, brought a laptop, recorder and CDs to enable students to listen to some sentences, but since the LC had only two sets of headphones, students had to take turns to listen. During investigations and observations in the educational area, no government intermediate school was found which had a language laboratory.

In the government schools the potential of ICT has yet to be realized in Saudi Arabia, for a variety of reasons, including teacher resistance and inadequate teacher preparation, and budgetary constraints, as the following sections demonstrate.

5. Teacher resistance

One factor in the failure to integrate computer technology into subject teaching can be the unwillingness of teachers to depart from traditional methods with which they are familiar. Such attitudes were not surprisingly more prevalent among the "original teachers" (qualified teachers with five to ten years teaching experience, with permanent positions in the school) than among trainees on their semester practicum, which forms a compulsory part of their pre-service preparation. One experienced teacher, who was noticeably reluctant to use the LC, was observed to follow the "old" textbook-based, grammar translation method of teaching. He wrote vocabulary or grammatical points on the board, asked students to copy them into their exercise books and memorize them, and set assignments to be completed in their workbooks. He rarely used teaching aids, apart from the occasional poster. One of the English teachers in the first case study school expressed a marked reluctant to take students into the LC. He reported that he did not think that kind of activity would lead to any progress in students' performance. He expressed similar doubts concerning language laboratories.

Further comments by another teacher, with more than 20 years' experience and close to retirement, suggested that his view may have been coloured by his feeling of being under pressure. For instance, he said he had no time to use language laboratories, because he had to teach 24 classes per week and this did not leave enough time for language laboratories. He commented, "I haven't got time to take my students to the LC because if I took them there I'd need extra hours. I'm teaching overloaded." When asked what he meant by needing extra time, he went on, "I'd have to bring them in the evening, because I haven't enough time in the morning." This teacher seemed to view use of the language laboratory as an extra chore that would have to be fitted in, an addition to his normal classroom teaching. Moreover, he argued, "It's not my responsibility to use ICT."

Another reason for teacher resistance appeared to be a concern that any departure from the current methods, particularly in the direction of more student participation, would result in a breakdown of discipline and a failure to take learning seriously. This was related to a general perception, even among those who favoured the use of technology, that the purpose was primarily entertainment –to make the subject more 'fun', rather than to achieve desired learning outcomes. In this respect, they seemed to misperceive not only the potential role of computers but also the attitudes of students, who in discussions with me expressed a strong need for access to computer facilities in order to develop their linguistic ability. For example, one student told me: "Please, professor, if our teacher brings us to the Learning Centre and uses the overhead projector with his laptop to show us some English programmes, we will be good at English in the future." When asked to elaborate, he suggested, "We will graduate from intermediate and go to high school with a very good background in English."

Over and above time constraints and concerns about discipline and learning outcomes, however, a major reason for teacher resistance to using ICT in subject teaching is that they simply do not want to use it. This may be due to a lack of technical proficiency and confidence in using ICT and/or a lack of pedagogical understanding of how to employ it effectively in EFL. That this may be the case is suggested by the greater willingness to use ICT among trainee teachers, who were familiar with computer technologies through their university preparation. One trainee, whom I was observing on his practicum, for instance, reported the following: "I prefer to use my laptop in the learning centre instead of explaining my lesson in class, because I've heard of the benefit of such lessons from my colleagues." This raises the issue of training, to which I now turn.

6. Training

In order to integrate computer technology into their teaching, teachers must have a degree of competence and confidence in using the technology, as well as some understanding of how ICT relates to learning theories, and of its potential in specific subject areas. Teacher preparation in Saudi Arabia, however, does not routinely cover such issues, although the position varies from one university to another; in the English Department at Imam Mohammed Ibn Saud Islamic University students take two compulsory courses, at levels 6 and 7, in using computers in EFL.

In some institutions, however, graduates in Arts and Social Sciences, in particular, may have had little or no exposure to computers, as computer skills are not a requirement of graduation; any computer access or training available tends to be confined to students of Science and Mathematics. Those teachers who have an Education degree may perhaps have attended a lecture on the use of computer technology in teaching, but may have no opportunity to practise integrating computers into their subject teaching, even during the final-term teaching practice placement.

In this situation, in-service training could clearly have an important role to play. In theory, there are various kinds of training available. Special training courses on various topics are provided free of charge at the Training Centre in each educational area all over the Kingdom. The centre sends official letters to specific schools, inviting teachers to attend. There is, however, a problem of take-up of such courses, due to the inconvenient timing and conflict with teachers' other responsibilities. Courses are commonly held in the morning, clashing with teachers' regular teaching duties (they attend from 6.30 to 12.30) and staff shortages make it difficult to arrange cover in order to release teachers for training. One teacher reported that "Even if I had received an invitation from the Ministry of Education to attend a course in ICT, I couldn't have attended for that reason." However, it appeared that courses held in the evenings would be no more popular, as teachers preferred to keep the evenings free for family, especially as no training allowance is offered as an incentive to attend. It seems, therefore, that careful thought needs to be given to the manner in which training is provided, and to how teachers may be enabled and encouraged to attend.

7. Budget and resource constraints

In some of the schools visited, difficulty in exploiting ICT in teaching EFL was at least in part due to insufficiency of resources. The *Watani* project, referred to earlier, has not yet been fully implemented. In the absence of adequate resources in the schools, instances were noted of teachers taking their own laptop computers into school, together with CDs of supplementary teaching materials, which they had provided at their own expense. However, not all teachers were able or willing to do this. As one teacher commented, "I don't want to pay money from my pocket to buy a laptop and English programmes and bring them to school to teach English. The Ministry of Education is responsible to provide us with ICT facilities."

Another, discussing the shortage of facilities in his school, expressed impatience with the delay involved when facilities were requested by the government. He complained, "We need an English lab, but you know the intricacies of the bureaucratic process in our country."

Both bureaucratic delays and financial constraints were reflected in the experience of the head-teacher in one intermediate school in leased premises. He showed me the small library he had created, but regretted the absence of ICT facilities; there was no LC. We discussed the possibility of a room being cleared, in order to set up a small English lab, and on a subsequent unit, I found this had been done. "What do I do now?" asked the head-teacher. I gave him contact details for a Sony representative based in the United Arab Emirates, who set up labs in schools across the Gulf countries, and would be able to advise on what equipment could be fitted into the room, as well as a quotation on price, to be forwarded to the Ministry of Education. He submitted a plan for 25 computers with headphones, and the official request was made. More than two months passed without a reply. The head-teacher made repeated calls to follow up his request, and was told he would have to wait, as no budget for the project was available. Eventually, at the end of the semester, the Ministry of Education announced its rejection of the project on financial grounds. This disappointing experience is by no means uncommon in schools that request provision of resources, however desirable these may be in educational terms.

8. Conclusion

This article has highlighted important issues associated with the use of ICT in intermediate schools in Saudi Arabia. Despite the intentions of the recent *Watani* project, ICT equipment is often unavailable and even where available is underused. It seems that the explanation for lack of computer use must be sought in a complex

interaction of factors, including bureaucratic confusion, lack of teachers' awareness, perceptions of student roles, the nature of the centrally prescribed curriculum and budget constraints. Nevertheless, in the Saudi context, there is anecdotal evidence from students and teachers who have experienced EFL teaching with ICT that student participation is increased, and motivation and learning enhanced. In my experience, many Saudi teachers, however, are unaware of these success stories. The growth and application of new ICT in the field of education is fraught with immense difficulties. Projects such as *Watani* will only succeed if adequately funded and accompanied by opportunities for teacher training and development programmes. Supervisors could play a vital role through disseminating information, liaising with trainers to develop courses that address teachers' needs, enlisting head-teachers' support for new educational initiatives and arranging opportunities for teachers to observe examples of good practice. Teacher competence and commitment is crucial for countries, like Saudi Arabia, that are seeking to promote educational improvement through ICT. Most important of all, however, is an environment in which teachers are not simply passive implementers of educational directives, but are encouraged to be dynamic professionals, engaged in career-long learning and actively sharing in the development of policy and practice.

9. Recommendations

In the light of this conclusion, the author suggests the following recommendations:

1. There should be more emphasis on developing a number of teaching skills such as classroom management.
2. There should be more emphasis on modern teaching methods in teacher training courses, such as language labs and multimedia technology. This will help teachers to be well-prepared to face teaching challenges.
3. There must be intensive sessions at universities on preparing teaching aids in order to enable teachers to prepare them more skilfully.
4. Qualified teachers should be chosen according to a group of training-related professional criteria. A scale can be developed for this purpose including qualification, experiences in supervision, teaching and training, willingness of participation in training, familiarity with the training programmes in technology, behaviour at school and relation to colleagues.

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Project

for CLIL Teachers

Caoimhín Ó Dónaill* and Ana Gimeno-Sanz**
*University of Ulster (Northern Ireland) | ****Universidad Politécnica de Valencia (Spain)**

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*c.odonaill@ulster.ac.uk | **agimeno@upvnet.upv.es

The EU-funded *Tools for CLIL Teachers* project has created a free online service where language teachers can author and share content-rich, multimedia learning units featuring the creator's own choice of audio, video (e.g. from YouTube), text (e.g. a transcript) and images/graphics. No installation or setup of software is required. The authoring tools feature a unique and innovative element of functionality i.e. the ability to automatically link every word in a text to online dictionaries in over 100 languages.

The teacher will have the choice of either sharing the resulting webpage online from the system's repository or of sharing a link to the webpage on websites, via email or institutional VLEs, for example. The beauty of this system is that technical knowledge of FTP/URL and online publishing is not required.

The online service also enables authoring of learning units from mobile devices (e.g. iPads) and is compatible with any operating system (Linux, Windows, MacOS, Unix etc.). The learning materials may also be accessed and used via smartphones, and materials may also potentially be authored from smartphones. We hope that the ability to access the learning materials from smartphones will encourage teachers to create materials.

The user friendliness of the system also benefits teachers of mainstream languages and results in bespoke VOLL (Vocationally-Oriented Language Learning) and CLIL (Content and Language Integrated Learning) materials in the LWUTL (Less Widely Used and Taught Languages). The inclusion of Arabic also serves a large and growing target group teaching and learning that language.

We are convinced that the online system, both the content authoring tools and the repository of materials, will be of huge benefit to educational institutions and learners alike, not least because the service is free of charge and open source (i.e. to enable future development). Crucially, the authoring tools and resulting content can be used from inexpensive mobile devices and older computers as they do not require high data processing capacity or bandwidth. This is a key factor in facilitating the adoption of technology, as there is no assumption that end users will need to acquire new hardware or upgrade their existing hardware in order to avail of the service. Such unseen costs

frequently prevent the uptake of new technology and are a source of frustration for potential end users who recognise the benefits of new technology.

In the following sections we shall describe **Clilstore** and its two integrated tools, *Multidict* and *Wordlink.* All three applications are accessed online at multidict.net.

Figure 1. **Clilstore** homepage*.*

Clilstore

Clilstore is a multifaceted site which (i) caters for teachers who wish to create or find multimedia language learning units to use with their students and (ii) offers a repository of language learning units in a variety of languages which students can access directly and use independently. Students are also welcome to register as authors and create and share units. The repository of existing units is open access, therefore, teachers or students wishing to use existing units do not have to register with the service before viewing or using the materials. Anyone wishing to create units must first register and have their email address verified. The authoring interface has been designed to be user-friendly, however, new users are encouraged to read the step by step guides provided on www.languages.dk/tools and if possible to avail of one of the many training workshops offered by the Tools team (details available on project website). The emphasis in Clilstore units is on multimedia i.e. using combinations of video, audio, images, text, hyperlinks and supporting secondary technologies which allow for the creation and sharing of interactive language exercises etc. In order for Clilstore language learning units to be most effective, however, they should contain a significant amount of text. The reason for this is that a key element of what makes Clilstore a unique language learning service is the way the software treats embedded texts. At the touch of a button all words are automatically linked to our bespoke dictionary interface *Multidict,* which places online dictionaries in over 100 languages at the learner's disposal, thereby enabling them to interrogate texts at their own pace and according to their own learning requirements.

Multidict

Multidict functions as a stand-alone online dictionary interface accessible at multidict.net or directly at multidict.net/multidict but also as the one stop shop for all of the language

combinations featured in Clilstore language learning units. Once users of Clilstore units click on words in embedded texts, the *Multidict* interface opens beside the Clilstore unit thereby facilitating easy dictionary consultation for learners. The majority of the 100+ languages catered for by *Multidict* will feature multiple online dictionaries, therefore, if a learner is not satisfied with the first result from their search (which they will have performed by simply clicking on a word in the embedded text) they can simply consult another source by either selecting it from the drop down menu of available dictionaries or by clicking on the dictionary icons, without having to re-enter the search term. *Multidict* will also facilitate bilingual consultation between pairs of languages for which no print dictionary exists (e.g. Irish Gaelic to Scottish Gaelic).
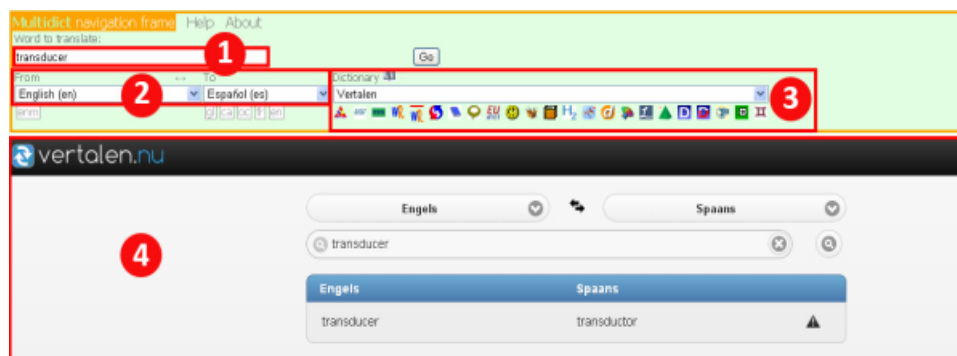
Figure 2. Multidict stand-alone interface.

1. Word entry field.
2. Language pairs: source and target language.
3. Selection of online dictionaries. Both drop-down menu selection and icon selection.
4. Selected dictionary interface with translation.

It is important to select the dictionary which best suits the particular translation need. Each dictionary has strengths and weaknesses. If a dictionary does not have the word being searched for, a different dictionary can be selected either from the drop-down menu or from the dictionary-specific icons.

Wordlink

Wordlink can link most webpages word-by-word to online dictionaries. It is the software which facilitates the automatic linking of every word in embedded texts within Clilstore language learning units and can also be used as a stand-alone tool accessible at multidict.net or directly at multidict.net/wordlink for learners who wish to easily consult online dictionaries as they read through webpages.
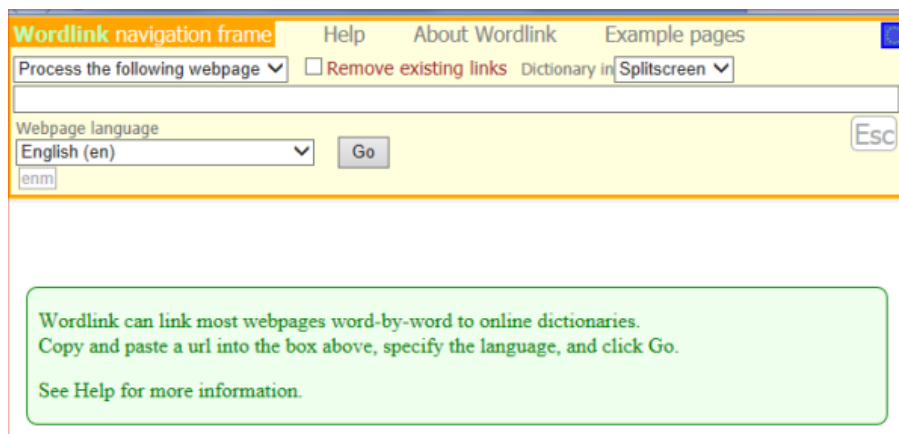
Figure 3. Wordlink navigation frame.

When using *Wordlink* as a stand-alone tool to link all the words in a given webpage to the online dictionaries available from *Multidict*, the first thing we have to do is select the language of the page from the drop-down menu. After that, we have to paste the URL of the webpage we wish to link into the appropriate field and click on "Go" (see highlighted section 1 in Figure 4 below). This enables us to click on any of the words in the text and look it up in *Multidict* (see highlighted section 3 in Figure 4). As we can see in the Figure below, the word that has been clicked on in the text is "considerado". This information automatically transfers to the *Multidict* navigation frame, as we can see in section 3 in Figure 4. Lastly, the translated entries appear in the native interface of the selected dictionary. In the sample below (highlighted section 4), the dictionary displayed is *WordReference.*

As we can only look up one word at a time, if we wish to translate a compound word, such as "look after", we have to type in the missing word(s) in *Multidict.* In order to save time, *Multidict* is capable of remembering which dictionary was last used and the language pairing that was being worked with, although the language and dictionary can be changed at any time.

Additionally, if we click on a link within the webpage we have "imported", then the next page will also be converted by *Wordlink.* In case we wish to look up a word which is already hyperlinked, then we need to select "Remove existing links" and click "Go" (see highlighted section 1 in Figure 4.

Figure 4. Sample page from Wikipedia about Spanish author, Miguel de Cervantes, linked to Wordlink.

In the following section we shall see how *Multidict* and *Wordlink* are used in the Clilstore student interface.

Clilstore student interface

Once we have entered the student interface by clicking on the arrow pointing towards "Students" in www.multidict.net (see Figure 1), learners encounter the screen illustrated in Figure 9.

First of all the learner has to select the language he/she wishes to practise. This is done by selecting a language form the appropriate drop-down menu (see highlighted sections 2 and 3 in Figure 9 below). Next, the learner has to select the target language level of his or her choice by clicking on one of the option buttons. A learner may also choose to select all the units that are available for a given language by clicking on "Any" (see Figure 5). This will call up a list of all the available units to practice that given language at the specified target level.

Figure 5. Language proficiency levels as describes in the CEFRL.

Once the list of units appears on the screen, additional information is provided to describe the contents of a given unit. As pointed out before, the level and the title of the unit, plus an icon describing the media type embedded in the unit, i.e. video, audio or none. However, if the learner selects "Student page – more options" from the drop-down menu (see 1 in Figure 9), a number of additional descriptors appear to allow learners to filter and find a particular unit; i.e. number of words comprising text in unit and duration of media file. These additional filtering options include:

- Id: Unique unit identification number.
- Hits: The number of hits, which gives the user an idea how many times a unit has been used.
- Changed: The date when the unit was last modified or updated.
- Owner: Who the designer of that unit is.
- Level: To select a range of levels from the CEFRL to make it easier for the learner to find units matching his/her level.
- Title: Word appearing in the title of the unit.
- Text or Summary: To search for specific key words appearing in the summary or the text of a given unit.
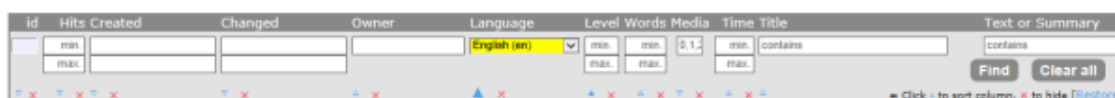
Figure 6. Clilstore student interface filtering options.

A very useful filtering option is that which allows the learner to enter key words into the "Text or Summary" filter field. In Figure 8, we can see that there is currently one unit featuring the keyword "plug".

Figure 7. By entering a key word into this field the learner can easily find a specific unit where that item is featured.

Figure 8. List of units which appear after searching for a key word in the text and summary of a given unit.

As we can see in Figure 8, the result of our search has called up one unit; i.e. "UK homes are a minefield of electrical hazards" at the required language level. Additionally, it is possible for the learner to sort the list according to any of the above mentioned preferences and to hide any of the information columns by clicking on the red-coloured "x" next to the sort-column icon. Lastly, it is also possible to restore everything to the default options by clicking on "Clear All" or "Restore".

Figure 9. A view of the Student Interface where users (teachers or learners) can use a series of filters to find learning units specified by language, learner level (according to CEFRL), word count, video length or keywords.

1. Drop-down menu allowing navigation between the Student Interface and the Author interface
2. Filter by the source language of the unit, i.e. the main language featuring in the audio, video or text content of a unit.
3. Filter by the learner level as specified by the unit authors in accordance with the Common European Framework of Reference for Languages (CEFRL). The scale ranges from A1>A2>B1>B2>C1>C2, with A1 being the easiest and C2 the most difficult.
4. Filter according to the length of embedded texts by word count.
5. Filter according to the length of any embedded video files.
6. Filter by keyword in the Unit Title.
7. Filter by keywords in the author generated summary of the unit or the unit's embedded text.

Let's now have a brief look at a unit to see the options that are available for learners. A unit will typically consist of a media file –normally a video sequence–, its script (with all of its words linked to a wealth of online dictionaries thanks to *Multidict),* and links to further exercises or learning materials.

Figure 10. The view of a unit once it has been selected and a learner-determined word clicked on.

- The author of the unit will have already indicated the source language, therefore, this lets *Multidict* know where to begin.
- The learner can select the language they wish the search term to be translated into, or if they select e.g. English to English they can perform a monolingual consultation.
- The user can quick-switch between dictionaries by using the drop-down menu of available sources or by clicking on the dictionary icons. They are not required to re-enter the search term in order to switch between dictionaries.

A detailed step-by-step guide to registering with the Clilstore service and creating and sharing units can be found in the "do-it-yourself" videos listed below. These videos have been created to support teachers who wish to create Clilstore units and students/learners who wish to use the service independently. These videos are available in all of the project languages.

www.manaraa.com

	Teacher DIY Videos	Student DIY Videos
English	http://youtu.be/yaiybnAnEuU	http://youtu.be/WjGt5d4AXBs
Danish	http://youtu.be/2sVai-_Qqtc	http://youtu.be/wbpiaBd2imc
Spanish	http://youtu.be/2CjQ8V0bCj8	http://youtu.be/Mp_aFDC4o24
Irish	http://youtu.be/BB10jBjbAS0	http://youtu.be/bzyFWvvXtw8
Scottish Gaelic	http://youtu.be/fGJzqaHGkis	http://youtu.be/eHnY7X-67vo
Portuguese	http://youtu.be/hyOmWVgtchI	http://youtu.be/Acj0Sb6RrtM
Lithuanian	http://youtu.be/7sGJ5ULxNKQ	http://youtu.be/mc8oQDp3Slc

Table 1. Links to the Clilstore "Do-it-yourself" videos.

Further information, as well as manuals in PDF format and several eBook versions are available from the project website in Danish, English, Irish, Lithuanian, Portuguese and Spanish.

Recommended website:

Readlang

Steve Ridout
Readlang.com

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steveridout@gmail.com

1. Introduction

Reading is a key skill in language acquisition. With engaging content it can be very enjoyable and motivating. The problem is the lack of interesting texts at suitable difficulty levels. Reading texts requires a lot of work on the part of the learner, both looking up definitions and making sense of the grammar. This work can turn reading into a chore and make challenging texts impossible to follow.

Readlang attempts to help by:

- reducing the work and distraction involved with reading difficult texts
- optimising the acquisition of useful vocabulary using a spaced repetition system
- recommending sources of content suitable for beginner learners

This article explains how the site currently works to achieve these goals. The site is in beta and rapidly evolving. This is a snapshot of how it functions at this stage.

Video

This 2 minute video gives an overview of how the site works:

http://youtu.be/ntVQ2L5s6FI

Reading aids

Readlang provides the following reading aids. These allow the user to focus on reading in their target language, and for the parts they don't understand, it helps them figure out the meaning with as little distraction as possible, hopefully allowing them to continue enjoying the content.

Inline translations

Clicking on a single word replaces it with a translation from Google Translate to the learner's first language.

Clicking on adjacent words, or dragging across a phrase, will replace them with the translation of the entire phrase. This is especially useful for collocations like phrasal verbs, verb conjugations with multiple words, or idioms which can't be translated literally.

Figure 1. Readlang functionality.

External dictionaries

A set of translations and/or definitions from an optional external online dictionary, which varies depending on the langauge. The following languages currently have external dictionaries:

- Spanish - WordReference
- French - WordReference
- Italian - WordReference
- German - WordReference
- Portuguese - WordReference
- Russian - WordReference
- Polish - WordReference
- Romanian - WordReference
- Czech - WordReference
- Greek - WordReference
- Japanese - WordReference (but only as a first language for the time being)
- Chinese - WordReference (but only as a first language for the time being)
- Welsh - geiriadur.net
- Dutch - mijnwoordenboek.nl
- Persian - farsi123
- Korean - dic.daum.net

Reading environments

Web Reader

This is implemented as a Chrome extension or a bookmarklet and allows the user to use the Reading aids from any other page on the web. Once loaded, a toolbar appears allowing the selection of the user's first and target languages, and allows disabling the reading aids in order to click on links within the page.

www.manaraa.com

The external dictionary in the Web Reader is optionally presented inside a separate window. Every time a word or phrase is clicked the external dictionary will update itself.
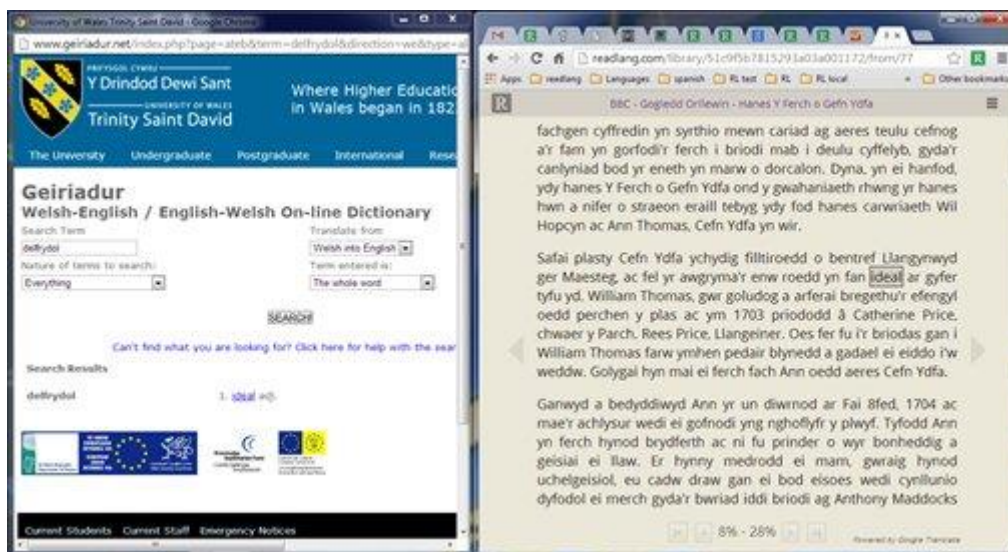

Figure 2. Example from Readlang.

Online eReader

This presents plain text content in a paginated format. The user's position in the text is stored so that when they log in from any device they can continue reading from where they left off. The external dictionary is optionally presented in the sidebar.
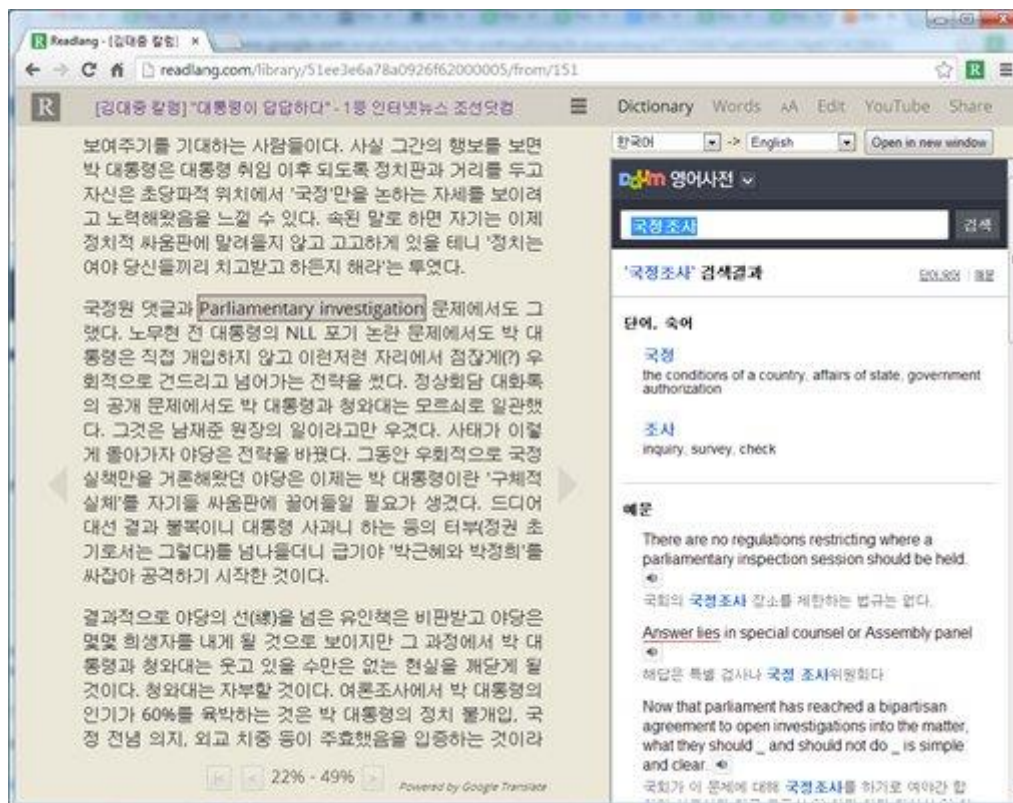

Figure 3. Readlang sample page.

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Sources of texts for the online eReader

Users can read texts from multiple sources:

- Web Importer - Extracts the content of any web page in plain text format.
- Enter plain text - Type or paste plain text directly into a form.
- Upload plain text file - Upload a plain text file. PDF or ePub files can be converted plain text format first using software such as the open source Calibre.
- Readlang's public library - A crowd-sourced database of texts shared by Readlang users.

Difficulty grading

In languages for which word frequency lists are available, all uploaded texts are analysed in order to estimate their difficulty level on the Common European Framework of Reference for Languages scale. This is a custom algorithm which gives a reasonable indication of difficulty but isn't perfect and will be gradually improved over time.

Popular websites

The database of user imported webpages is analysed to compile a list of recommended websites for learners of each language to find new content. For example, the top 5 sites among French users are:

- www.podclub.ch - A site containing podcasts and accompanying transcriptions.
- www.lemonde.fr - A popular newspaper.
- www.laguinguette.com - Articles with audio for learners of French.
- fr.wikipedia.org - The French Wikipedia, a popular online encyclopaedia.
- www.rfi.fr - A popular newspaper.

Vocabulary building

Every word or phrase translated in Readlang is saved to your account, along with the context sentence. This allows you to either export your word lists to other tools such as Anki or use the flashcards and spaced repetition system built in to Readlang.

Flashcards

Readlang allows the user to review flashcards in sessions of 10, 20 or 30 cards. Initially, the context sentence is presented, with the relevant word underlined, and the user must guess the meaning of the word. They click to reveal the translation. Users are highly recommended to verify and modify the translation at this point, since the Google Translate results will obviously not be 100% accurate. To aid them with this, an external online dictionary is presented with alternate definitions if available. The spaced repetition system is modelled after other software such as SuperMemo and Anki. Upon revealing the translation on the flashcard the user is asked whether they remembered the word and given a choice of four options: "Not at all", "Almost", "Yes, just", and "Perfectly". If they remembered the word, its next appearance will be scheduled in progressively further dates in the future, whereas if they failed to remember it will be shown again in this session, and then again the following day. After successfully guessing the meaning of a foreign word, each subsequent time the flashcard appears it will be reversed, so the user is shown the translation in their first language and asked to guess the word in their target language, a more challenging problem.

In an improvement over other more general spaced repetition algorithms, Readlang uses the frequency of each word in a representative corpus of texts for each language to prioritise its position in the flashcard lists. This helps the user optimise their time by learning the most useful words first, and is particularly useful when the user's list of words greatly exceeds the amount of words they have time to practise.

Audio Pronunciation

Where supported by the Microsoft Bing text-to-speech API, audio pronunciation of words and phrases is available from the reader page and the flashcards page.

Video synchronisation

Readlang allows YouTube videos to be synchronised to a transcription so that learners can work on improving their listening skills, see Watching YouTube synchronised texts in Readlang for a demonstration. The currently spoken word is highlighted so that the listener doesn't get lost, and any word in the text can be clicked on to start the video from that position.

Users may upload transcriptions and synchronise them to YouTube videos themselves, see Synchronising YouTube videos yourself for a demonstration on how to synchronise videos yourself.

Supported Languages

The readlang.com/languages page shows statistics for each of the currently supported languages. Currently the most popular language is French with over 52,000 flashcards generated so far, closely followed by Spanish with over 46,000.

Suggested use

Readlang has been developed as a tool for independent study. However, teachers may find it useful to upload texts or YouTube transcriptions to share with their students, and to encourage them to use the site to read content they are interested in for pleasure in their own time.

Editorial Board:

The EUROCALL Review is published online biannually by the European Association for Computer-Assisted Language Learning (EUROCALL) and is hosted online at http://www.eurocall-languages.org/review/index.html and at the Universitat Politècnica de València (Spain). Regular sections include:

- *Reports on EUROCALL Special Interest Groups*: up-to-date information on SIG activities.

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- *Recommended websites*: reports and reviews of examples of good practice in language learning website development.

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If you can provide information on any topic of interest to the CALL community, please send this directly to Ana Gimeno, email agimeno@upvnet.upv.es

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