

Demystifying pronunciation with animation

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Abstract. The orthographical depth of a language impacts on a learner's ability to learn a language (Katz & Frost, 1992). If it is easier for learners to read the language as it is written, it will make the learning process easier. One way to address the problem of orthographically deep or opaque languages where the pronunciation is not very easy to determine is to demystify its pronunciation by using animation. This involves showing learners graphically how a combination of certain letters or diacritics produces a particular sound. This is particularly useful when the combination is different to what might be expected given the learner's knowledge of how those letters or symbols sound individually. This is also important when two orthography systems may appear similar on a superficial level but are actually different. This paper provides an overview of the animation component of the CALLIPSO system – a CALL resource for Irish orthography and pronunciation. Irish uses the same letters as the English alphabet but there are differences in the letter-sound correspondences. In the animation component, words are passed to the animation tool which demonstrates how each combination of letters gives rise to the overall pronunciation of the word. The tool is language independent and can be used for languages other than Irish.

Keywords: orthography, pronunciation, animation, Irish.

1. Introduction

Languages have different levels of depth or transparency; this refers to the degree to which the written language follows a one-to-one letter-phoneme correspondence. The orthographical depth of a language impacts on the learners' ability to learn as well as their motivation. For example, in terms of a beginner's ability to read and pronounce words in a language, an orthographically shallow (or transparent) language like Spanish is less challenging than an orthographically deep (or opaque) language such as English. For instance, learners with a knowledge of the Latin alphabet can give

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at least an approximate pronunciation of Spanish even if they cannot understand the language. However, in the case of orthographically deep languages, learners can struggle to read words and this can lower their motivation levels. Orthographically shallow languages include Spanish, Italian and Finnish, whereas English, French and Hungarian are considered to have deep orthographies (Katz & Frost, 1992).

Irish is the official first language of Ireland, but the vast majority of the population are L1 English speakers. Most learners of Irish are compulsory learners as Irish is a core subject on the national curriculum. Motivation is especially important for compulsory learners who have to learn the language, as opposed to voluntary learners who choose to learn the language.

Animation is an approach to demystify the pronunciation of a language. This involves graphically showing learners how a combination of certain letters or diacritics produces a sound combination. This is particularly useful when the combination is different to what might be expected given the learner's knowledge of what those letters or diacritics sound like individually. For example, in English the combination 'th' sounds different to that what a learner might expect when a 't' and a 'h' are combined, based on their sound as standalone letters. This is particularly important when two orthography systems may appear similar superficially but are actually different.

Animation has been used in many domains for teaching and learning purposes (Ainsworth, 2008). Animation is useful for showing learners the transitions from one state to another and has been used in medical learning for many years (Grange, Bunker, & Cooper, 1997), but was not used extensively in the area of language learning, though there are many potential uses in the language learning context, such as showing word formation in morphologically rich languages or sentence structures in languages with different types of word order. Research in the area of visualisation and learning suggests that key pieces of past information should be visible to the learner and that users can control the speed of animation, although the issue of potential cognitive overload has to be taken into consideration.

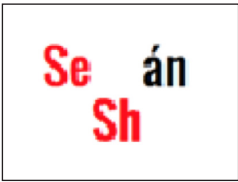
2. Method

2.1. Overview of Irish orthography and pronunciation

An animation component has been added to the CALLIPSO system (CALLIPSO, 2016), which is a CALL resource for Irish orthography and pronunciation. Irish

uses the same letters as the English alphabet, with the letters ‘j, k, q, v, w, x, y, z’ only found in loanwords. However, there are differences in the letter-sound correspondences. Vowels present a particular challenge for L1 English learners of Irish, that is, the vast majority of Irish learners. They often ignore the accent and pronounce the letters the same way as its corresponding non-accented vowel. In the animation component, annotated words are passed to the animation tool which demonstrates to the learner how each combination of letters gives rise to the overall pronunciation of the word. For example, the popular Irish first name *Seán* is pronounced *Shawn* [ʃ aː n̪ˠ], but ab-initio learners may pronounce it as *Say-an* [seɪ- æn]. The animation tool explains the correct pronunciation of the word as a series of steps. Firstly, the learner is shown that ‘á’ is the key vowel to pronounce and that the other vowels are ignored. Then the tool explains that ‘á’ has an ‘aw’ [a:] (as in ‘raw’) sound. The ‘s + e’ combination means that the ‘s’ is pronounced as ‘sh’ [ʃ]. At the end of the animation process, the learner can see the steps involved in arriving at the correct pronunciation of the word. The tool uses a combination of colours and movements to demonstrate these steps (see [Figure 1](#)).

Figure 1. Screenshot of the animation of ‘Seán’



3. Discussion

From a pedagogical perspective, some would question the synthetic phonics approach to teaching orthography and pronunciation (see [Torgerson, Brooks, & Hall, 2006](#) for an overview of analytic and synthetic phonics). However, a similar approach has been used for teaching English to young L1 learners and it has been quite successful ([Johnston & Watson, 2005](#)). Children can pronounce previously unseen words comfortably and feel more confident in their reading. The CALLIPSO animated visualisation tool was originally designed for autonomous adult learners – with two specific groups in mind. The first group consists of parents of children learning Irish in school. Most parents will have studied Irish themselves in school, but a large cohort would have limited mastery of the language (e.g. immigrant

parents who have never studied Irish). Given that Irish is a compulsory subject in primary and secondary schools in Ireland, parents may struggle while helping their children with their Irish homework – especially when checking their spelling and reading skills. A parent cannot ask a child to spell a word such as ‘teach’ (house) if s/he pronounces it like the English word *teach* as opposed to the correct pronunciation [tʲ a x].

The second group of learners consists of trainee teachers. [Hickey and Stenson \(2011\)](#) highlighted the need for a systematic approach to the teaching of Irish orthography. They argued that children struggled with reading in Irish because they did not know the rules of Irish pronunciation and there was an incorrect transfer from English, the L1 of the vast majority of the learners. They did not know the rules because they were not taught to them. This was because the teachers were not explicitly taught the rules themselves, which in part may be due to the fact that the rules were never fully defined. [Hickey and Stenson \(2011\)](#) have worked to address this issue and have published the rules of Irish pronunciation, which is indubitably a complex area. Ongoing research is required, but their work to date provides a basis for the tool discussed in this paper, which could be used by trainee teachers themselves to ‘confirm’ their intuitions about Irish pronunciation or as a way of familiarising themselves with the patterns without having to expose their lack of knowledge to their peers or lecturers.

4. Conclusions

In recent years, research in CALL has tended to focus on Web 2.0 resources such as wikis, blogs and mobile learning. These resources could be classified as CALL tools on [Levy’s \(1997\)](#) CALL tool-tutor spectrum. They are computer-based tools that facilitate the teaching and learning of a language, but were not specifically designed for the purpose of language learning. The development of CALL specific artefacts, such as the CALLIPSO animated visualisation tool presented in this paper, is difficult and requires more time and resources than using an already existing technology, which is perhaps why there are generally less reported on in the CALL literature. However, there is room and a need for such resources. It is important that such resources are built using good software engineering techniques and incorporate reusability and sustainability concepts in their design to try to ensure that the resources can be used in other contexts and with other languages where possible, as in the case of the CALLIPSO animated visualisation tool, which can be used for languages other than Irish.

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