

# COMPUTER ASSISTED LANGUAGE LEARNING OF OLD ENGLISH: CALLOE

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*It is undoubtedly a fact that Old English stands out as one of the most difficult subjects for undergraduate students as they do not find it particularly easy to handle its morphology, phonology and orthography. In order to ease the students' learning of Old English, we have devised and implemented CALLOE, a pedagogic multimedia application which is expected to help the students to achieve a successful and a self-access interactive learning of Old English. Therefore, the aim of this paper is to present CALLOE outlining its main modules (morphological tagger, text library, sound device, help-modes, exercise-manager) along with the students' evaluation of the program.*

## 1. Introduction

The subject of Old English (OE) has been indirectly affected by the changes adopted in the new educational system of our country as the students of English Philology are more and more frequently forced to learn OE with no previous knowledge of other highly inflected languages and, therefore, they are likely to find serious difficulties which may lead to a loss of motivation and failure. In order to ease the students' first steps in OE we have designed and implemented CALLOE, a pedagogic multimedia application for Computer Assisted Instruction which is expected to help the students to learn the morphology, phonology and orthography of OE, and to further improve their translation and reading skills.

In the course of this paper we aim to (1) outline the difficulties encountered by OE learners, (2) describe CALLOE, and (3) present the results of the students' evaluation.

## 2. The learning of OE: main difficulties

Although from our own experience we could give most of the main reasons which motivate the students' failure in OE, we considered it more reliable to check out our hypothesis against the students' opinion by handing out a questionnaire for them to fill in, and almost all of them highlighted those features which distinguish OE from Present-day English as the most controversial, such as high inflectional richness, grammatical gender, non-cognate vocabulary, different word-order, phonological and orthographic system, etc. Specific difficulties are also found when dealing with inflected infinitives and/or (absolute) participles, or when distinguishing between strong and weak verbs/declensions, or personal pronouns in genitive and declined possessives, etc.

Due to its rich inflectivity, previous knowledge of Latin or German was considered an asset for the learning of OE declensions and conjugations as well

as for the relationship between case and syntactic function. German vocabulary (and the 2nd Consonant Mutation) is also reported to be useful for OE lexis learning.

We cannot avoid completing this overall picture without mentioning the following facts:

a) Some students do not come to understand how more than one sound (phoneme or allophone) can be represented by just one graph, as in *gán* [g], *lagu* [g], *gé* [j], or *beorg* [x] all written with <g>.

Although the existence of graphs such as <þ>, <ð>, <æ>, etc., does not seem to arise the least difficulty, however, the students usually tend to fail when reproducing <þ>/<ð>, <f>, <s> in sound or unsound contexts (*ðber* [d] vs. *þā* [q]; *wifes* [v] vs. *wif* [f]; *wīse* [z] vs. *wīs* [s]).

b) The students are frequently misled by the lack of standardization (de la Cruz, 155-71), one of the most significant problems in the spelling of OE since they may affect either the stem or the inflection of a word, or both, complicating thus the students' learning and word search in dictionaries. The spelling changes are sometimes provoked by phenomena such as metathesis, velarization, elision, compensatory lengthening, assimilation, etc., or they must be dealt as interdialectal/intradialectal variations, or could even represent scribal errors.

c) A great effort is sometimes required to make the students understand the existence of duplicative or alternative forms such as *fæder/fæderes* and *dohtor/dehter* for SinGen, or *frīend/frēond/frēondas* for PluNom/Acu.

All these difficulties and others not listed here constitute some of the problems that we must solve by means of computational linguistics. For us it will be a challenge to successfully carry out this project which, at the same time, may convert a tiresome difficult learning subject into a motivating interactive activity.

### 3. CALLOE

CALLOE is a user-friendly application (to be run under a WINDOWS environment) which has been conceived with the pedagogical purpose of devising an effective method to achieve a successful and self-access learning of OE. In this section we will analytically describe CALLOE by focusing on each of its components.

#### 3.1. MAOET

CALLOE is provided with an automatic morphological analyser and tagger of OE texts (MAOET) which we designed and implemented to completely satisfy our requirements after having previously tested other morphological taggers (Antworth, 389-98).

MAOET performs the morphological analysis and tagging of texts by means of a set of dictionaries (prefixes, lexemes, and morphemes), on the one hand, and a context-free grammar, on the other. The program automatically divides OE words into the three possible chains of characters in which a word may be split for its morphological analysis (prefixes, lexemes, and morphemes) and, after consulting the dictionaries and applying the grammar, it subsequently displays on the screen the corresponding tagging.

As mentioned above, MAOET works with a context-free grammar defined by a set of rules which are used to connect the lexemes with their corresponding morphemes. These rules state which 'lexeme continuation class' can be followed by which 'morpheme continuation class', task performed by matching the contents of a common key field in both dictionaries.

Actually, the threefold dictionary structure and the grammar employed has turned out to be very efficient on account of the tests carried out as MAOET reliably analyses and tags a great number of words without increasing the size of the lexical dictionary at an average rate of fifteen words per second using a microprocessor at 200 Mh.

Once a text has been loaded, MAOET offers the possibility of analysing the text sentence by sentence or as a whole and subsequently it displays

the tagging which can be scrolled for consultation or saved as a text file. If the first option is chosen, the following sentence may be analyzed at the user's request and the same procedure may be repeated until the end of the text. Instead of a sequential analysis, the user may also follow a random

procedure by just highlighting the words that he/she wants to be analysed.

As an illustration, we copy the tagging of the following text:

Þá Gregorius mētte Þá fægran cēpecnihtas Þá āscode hē of hwelcum lande oððe of hwelcre Þēode hīe bròhte wæron (De la Cruz et al. *Textos*, 31).

Þá [Þá:adv(then)] / [se, sēo, Þæt:DemPluNom (the)] / [se, sēo, Þæt:DemPlu Acu (the)] / [sēo:DemSinAcu (the)]

Gregorius [Gregorius:NouSinAcuMas (Gregorius)] / [Gregorius:NouSinNomMas (Gregorius)]

mētte [mētan:VerW1Sin1and3PrsInd (find)] / [mētan:VerW1Sin1and3PrsSub (find)]

Þá [Þá:adv(then)] / [se, sēo, Þæt:DemPlu-Nom (the)] / [se, sēo, Þæt:DemPlu Acu (the)] / [sēo:DemSinAcu (the)]

fægran [fæger:AdjWPluAcuFem(fair)] [fæger:AdjWPluAcu-Mas (fair)] / [fæger:AdjWPluAcuNeu (fair)] / [fæger:AdjWPluNomFem (fair)] / [fæger:AdjWPluNomMas (fair)] / [fæger:AdjWPluNomNeu (fair)] / [fæger:AdjWSinAcuFem (fair)] / [fæger:AdjWSinAcuMas (fair)] / [fæger:AdjWSinDatFem (fair)] / [fæger:AdjWSinDatMas (fair)] / [fæger:AdjWSinDatNeu (fair)] / [fæger:AdjWSinGenFem (fair)] / [fæger:AdjWSinGenMas (fair)] / [fæger:AdjWSinGenNeu (fair)]

### cēpecnihtas

[cēpecniht:NouSPluAcuMas(slave)] / [cēpecniht:-NouSPluNomMas (slave)]

As can be seen, the tagging produced by MAOET contains all the possible right analyses for each word leaving to the students the task of disambiguation which turns to be very instructive for them as they must choose the correct analysis in view of the context. During the whole procedure the student is allowed to activate each of the available windows in search of help, sound, etc.

*Old English Apollonius of Tyre* is also available for analysis.

The library is open to include other texts which may be written by the user in the EDIT facility or imported from other sources and a true-type specially-created font (FONETIK) has been designed for special characters (macron and IPA). This facility allows the student to practise individually with single words chosen by him/herself.

### 3.2. Text library

CALLOE contains a library of OE texts to be analysed by MAOET. Most of them are pedagogically adapted OE texts for beginners or intermediate level learners (Brook; de la Cruz; Mitchell; de la Cruz et al.). Along with them, *The*

### 3.3. Sound device

CALLOE is supplied with a sound device which can reproduce the pedagogically-created texts, the readings of which have been previously stored.

This feature offers the students the possibility of alternatively reading and listening to the text, and thus they may realize the features of OE phonology.

### 3.4. Help modes

CALLOE is supplied with a Help mode at the user's disposal to give general assistance information about the program and specific information about OE. It is an easily-run device which can be activated by just clicking on the Help window. The next unfolded windows offer the user all the possibilities from which he/she can choose. With respect to the specific information, it can be summarised as follows:

a) Morphology. In this option, paradigmatic information about nouns, verbs, adjectives, pronouns, etc., is provided and, when necessary, coloured characters are used to distinguish between lexeme (stem) and morpheme (inflection). For each of the paradigms further windows are unfolded with a tree-branch format. For example, in the case of verbs the students are led into strong verbs, weak verbs, preterite-present verbs or anomalous verbs. In the first option one is offered tense formation, classification, strong verbs classes, etc. Finally, for each of the seven classes an alphabetical list of the main verbs is displayed, including infinitive, 3rd. person singular Present Indicative, Preterite-1, Preterite-2, P. Participle and Meaning. Similar treatment is offered for the other paradigms.

b) Phonology and Orthography. To illustrate the relationship between OE phonemes (or allomorphs) and graphs, we use several tables containing monophthongs and diphthongs as well as consonantal sounds and their corresponding (di)graphs. Examples with their phonemic notation (IPA) are also provided.

c) Translation. To help the students solve their doubts and check their own translations, a Spanish version of pedagogically adapted texts is available.

### 3.5. Exercise-Manager

CALLOE is supplied with an exercise manager which allows the students to practise by doing exercises such as to write the underlined word in the right form according to the context, to supply the missing words (demonstratives, prepositions, personal pronouns, etc.), to provide the morphological analysis of a word or, inversely, to generate the form from its morphological analysis, etc.

## 4. Evaluation

A prototype of CALLOE has been experimentally used by 23 students of English Philology with computer facilities at home. They were shown how to install and operate the program and for a term they have been using it as an auxiliary tool to prepare or review their class work. At the same time, they have taken down all the 'possible' mistakes or errors that should be corrected and they have emphasized CALLOE's main advantage and weakness, suggesting how it/they might be improved.

At the end of the term, the students were administered the following evaluation summary with rating out of 5 (Max = 5; Min = 1)

- a) Ease of use (installation, user-friendliness and time required to control it)
- b) Material relevance (difficulty, subject matter and activities balance)
- c) Language features (listening, grammar, vocabulary, translation, etc.)
- d) Potential for learning (interactivity, attractive design, adaptation to learner, tests, helps, etc.)

The table below contains the results of the evaluation summary. The figures in the first row cells stand for the rating values whereas the figures in the remaining cells indicate the number of students who granted that specific rating to each of the items on the left column.

Students' Rating	5	4	3	2	1
Ease of Use	3	13	5	1	1
Material Relevance	1	10	4	5	3
Language Features	6	12	2	1	2
Potential for Learning	7	9	2	2	3

From the results shown above we may deduce that CALLOE has turned out to be a valuable application in their learning process. In addition to this, we must point out that these students' assessment is over the average, which may be explained either by their initial higher motivation and daily hard work or the program's effectiveness. It is a fact that CALLOE allows the student an individualized work step and is bound to help the lecturer in the difficult task of teaching numerous groups (over 150 students). Therefore, next year we intend to use CALLOE with the whole group of students in the Faculty's Microcomputer Lab to gauge its effectiveness in the learning of OE.

We are continuously upgrading and improving CALLOE with all the suggestions that we receive, so we will be pleased to share it with anybody interested and we will readily study and accept all the modifications forwarded.

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