

# An e-learning platform for multiform and interactive education of scholars in Greek Paleography

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*Abstract:* - Today all around the world are taking place efforts for the preservation of antique documents and valuable manuscripts, which constitute a part of our vast artistic and cultural heritage. Could such an effort contribute to the preservation of manuscripts and simultaneously be used for educational purposes? That is the goal of the e-learning system that is presented in this paper. The content of this e-learning system is a meeting point of the past and the future, providing historic content, taking advantage of the new technologies with an original and interactive educational way. The system aims to provide fundamental knowledge to scholars in the Greek Paleography of the Byzantine era, through the processed presentation of authentic manuscripts taken from “The Book of Jove”, and interactive and multiform-levelled lessons.

*Key-Words:* - e-learning, paleography, manuscripts, transcription, interactive-learning

## 1 Introduction

Everywhere one looks, the Internet and the Information and Communications Technologies (ICT)[20] have transformed the way of working, governing [18,19], and communicating [17], as the technology has enabled and provides new ways for their realization.

E-learning is one of the revolutions that were born through the growth of the new technologies and the Internet and changed everyone's point of view about education and the delivery of knowledge [2,3,4]. The e-learning gives the opportunity to the user for distant learning through the Internet with such means as text, picture, audio and video. Some of the educational purposes of e-learning, are history [7,8], art [5,6] and literature [9,10]. Paleographic manuscripts are part of the three of them. Today somebody can find on the Internet a large number of e-learning platforms, partly from universities, which aim at the education of the users in paleography, through the provision of content [11,12,13,14,15].

The content is founded on the manuscript taken from “The book of Jove” and specifically the Sinaiticus Codex. The manuscript was elaborated in association with the Mount Sina Foundation and was integrated in the e-learning system in a unique way, in order to provide interactive education to the users [16].

All the content follows a specific structure of consecutive difficulty levels, simultaneously taking

into consideration the gained experience, as well as the clarification of the constituents of paleography, from the users during the educational process. The e-learning system is available via Internet and as a cd-rom, based on the standard of the platform independency.

## 2 Content Structure

At the first level lessons, examples of paleographical words, that contain letters only, were used, as the user for each letter has more than one selections, giving the user the opportunity to understand which letters are used in specific words and in which cases.

At the second level lessons, examples of paleographical words, that contain letters and combinations of letters, were used advancing the difficulty level.

At the third level lessons, examples of paleographical words, that contain letters, combinations of letters and the first type of abbreviations, were used.

There are two types of abbreviations. The first one consists of letters that are represented by joint letters and the second type consists of letters represented by a symbol. From the experience so far, the user can distinguish the letters, the combinations of letters and the cases that are used, and in this level the user is simultaneously trained on abbreviations.

### 3 New Features & Lessons

The e-learning system is enriched with new features such as pictures of the authentic manuscript of the “Book of Jove” and also a new interactive lesson for the Theory Lessons and a new section called, Theory Interactive Lessons, has been developed and integrated.

#### 3.1 The Introductory note

In the interactive lessons we chose not to include cases of letters, combinations of letters and abbreviations that appear rarely in “The Book of Jove” and in Greek Paleography in general, in order not to deviate from the educational purposes of this e-learning system. These rare cases of the constituents of Greek paleography may not be used in the lessons but they are reported and described in the Introductory Note, so that the user can have an integrated view of the constituents of the Greek pearlyscript paleography.

The introductory note also includes a map of the Greek polytonic keyboard layout and the Greek polytonic key combinations for Windows users (Fig.1). There are 25 diacritical marks and combinations of diacritical marks that are used in Greek paleography and are available through key combinations, hence the presence of the map was necessary for the users.

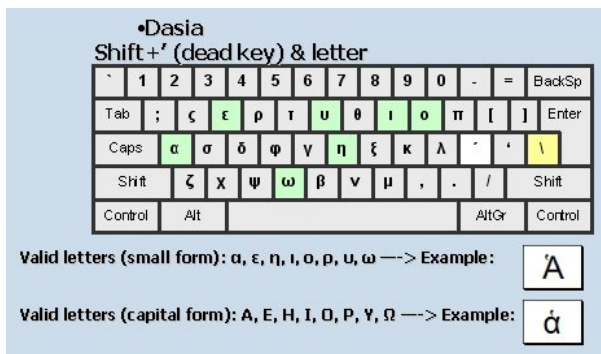


Fig.1 Example of key combination

#### 3.2 The Theory lessons

The Theory lessons have been enriched. The design has been changed and there are new features and a new interactive lesson.

##### 3.2.1 New Design

Entering this lesson the user comes across the instructions that have to be followed. The user is given the opportunity to study and learn the spelling of paleographic words, through a large number of representative examples. There is a column

containing the letters, the combinations of letters and the two types of abbreviations that are included in the educational content. For each one of them, there are examples, where the user can learn the letters, the cases and the words as well as part of the words where each letter, combination of letters and abbreviation is used in Greek paleography (Fig.2). Some of the examples are common with the examples used in the interactive lessons in order to make the educational process of the user easier.

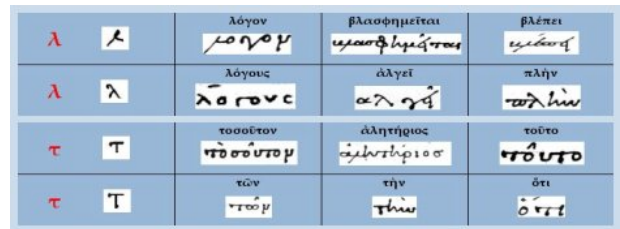


Fig.2 Sample of the Theory Lesson

##### 3.2.2 New interactive lesson

The theory course has been enriched with an extract from the Sinaiticus Codex of the “Book of Jove”. There, the user has the opportunity to see the letters, combinations of letters and the two types of abbreviations automatically distinguished in the book, by pressing the corresponding button. For example if the user presses the “Combinations of letters button”, the combinations of letters appear (Fig.3). The book extract is the same as the examples for the interactive lessons are based on, in order to facilitate the educational course of the user through the whole content. When the user has completed this page he can proceed to the next one by pressing the “next page button”.

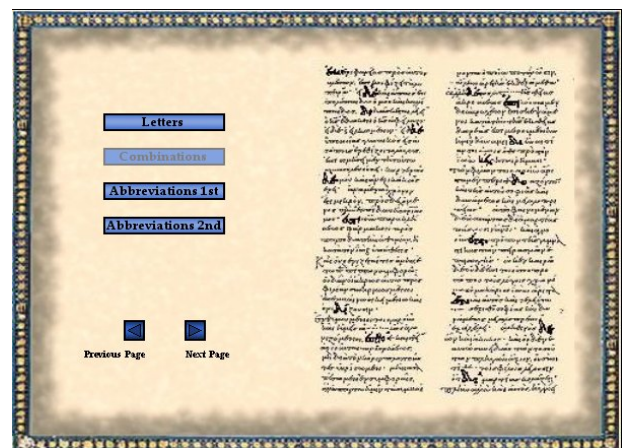


Fig.3 Sample of the interactive lesson

##### 3.2.3 New Features

The content has been enriched with pictures of the manuscript, from the Sinaitucus Codex of “The Book of Jove”. A section was created where, each page of

the extracted manuscript is presented accompanied by its translation, giving the opportunity to the user to read and study the authentic manuscript of the Sinaiticus Codex (Fig.4). By pressing the “next page button”, the user is transferred to the next page.

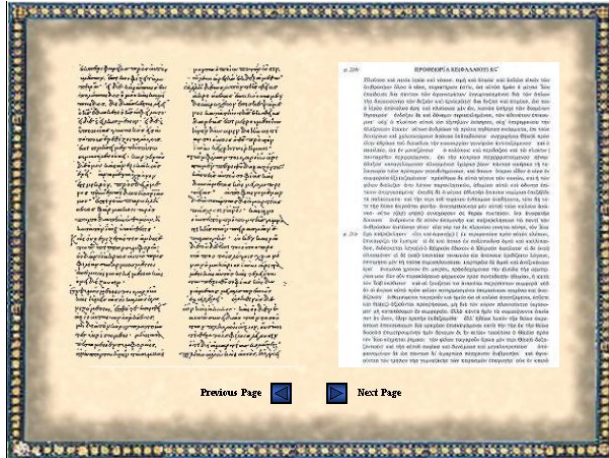


Fig.4 Sample of “The Book of Jove”

### 3.2 The Theory Interactive Lessons

A new type of lesson was developed that is considered important for leveled and integrated education of the user in Greek paleography, namely “The Interactive Lessons”. Though this lesson the user is trained and simultaneously evaluates his/her ability in distinguishing the letters, the combinations of letters and the two types of abbreviations (Fig 5). This lesson contains sentences where the letters, combinations of letters and the two types of abbreviations have been distinguished in a non-visible way for the user. This lesson follows the content structure on which the e-learning system is based. Hence, the user is primarily trained in distinguishing the letters.



Fig.5 Sample of the Theory Interactive Lessons

For example by pressing a part of the sentence that the user thinks is a letter, the application informs the user if it is correct or wrong, and what the part of the sentence that the user pressed, represents. From the theory and the theory interactive lessons, the user has obtained high skills in distinguishing and comprehending the letters, combinations of letters and the two types of abbreviations before proceeding to the interactive transcript and manuscript interactive lessons.

## 4 Development of the E-learning Environment

For the development of the e-learning system environment the java programming language was used. As far as the Internet platform is concerned, the java server pages (jsp) provides many benefits, such as, separated content and display logic, support of the software reuse through the use of components, platform independency, better tool support, portable to multiple servers and operating systems, extensibility, and it’s better for the development of dynamic parts. When exploring the opportunities that jsp gives, it becomes clear that the e-learning system Internet platform has gained a whole new look (Fig.6)

Moreover, as far as the development of the user interface is concerned, Java offers many advantages. It is platform independent, in order to give access to the content for any user, either he uses it via Internet or via cd-rom. Another advantage is multithreading, that is, the possibility for executing many processes simultaneously.

Multithreading was a basic requirement, especially for the development of the paleographical keyboard, where there was the need for presentation and usage of images and, simultaneously data input from the user.

The evolved libraries, Swing and AWT, made possible, the simultaneous presentation and usage of labels, buttons, text fields, and images for the development of the graphical user interface, in a window environment. Moreover, the constituents of the Java libraries are considered as lightweight, meaning that they are all written in Java, and therefore there aren’t visible differences, in the speed of the applications, despite the use of numerous images.

Using special methods for the text constituents, a comparison between the data given by the program, and the data input by the user, character by character, was achieved at the manuscript interactive

lessons, resulting in a more efficient education of the user.

Through the libraries that contain classes and interfaces for the support of text constituents, and through the ability given by the nature of Java, for selecting the desired font, the use of the Greek polytonic system, by the user for data input and from the content of the database, became possible.

Integrating the Greek polytonic system to the platform was not very easy, as it was recently included in the Windows software. Therefore, it is easy to understand that the Greek polytonic system is not included in any programming language development platform. Through special processes we integrated to the development platform a Greek polytonic font and managed to achieve the usage of the Greek polytonic system.

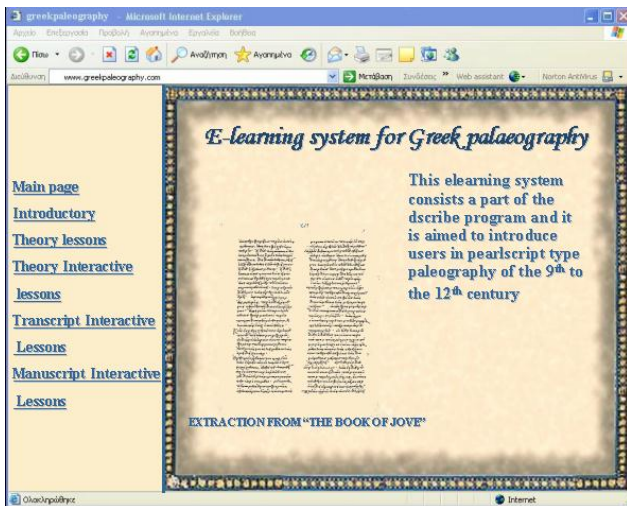


Fig.6 The new look of the site

## Conclusion

The effort for the revival of Greek manuscripts is in its beginning. We intend to continue this effort by enriching the content, with more manuscripts, types of paleography, and elements of the Greek paleography for the specific system. Already the scholars of the Theology department of the Athens University are showing great enthusiasm for the coming of such a tool in their hands. But should Greek paleography be aimed at scholars only?

“In the time that there is a great need for confronting the lexical poverty that appears especially in the young people, the return to the Greek linguistic inheritance is the answer to this problem”, as the President of the Greek Philologist Union remarks.

Hence, we plan to use the know-how and the infrastructure of this e-learning system that was used for this content, for a new system concerning Greek paleography and Greek manuscripts that will be

attractive and popularized and will aim at bringing every user close to the lexical and cultural wealth of the Greek language.

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