

LEXIPLOIGISSI: An Educational Platform for the Teaching of Terminology in Greece

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Abstract

This paper introduces a project, LEXIPLOIGISSI*, which involves use of language resources for educational purposes. More particularly, the aim of the project is to develop written corpora, electronic dictionaries and exercises to enhance students' reading and writing abilities in six different school subjects. It is the product of a small-scale pilot program that will be part of the school curriculum in the three grades of Upper Secondary Education in Greece. The application seeks to create exploratory learning environments in which digital sound, image, text and video are fully integrated through the educational platform and placed under the direct control of users who are able to follow individual pathways through data stores.

Technology in Schools

Technological literacy –meaning computer skills and the ability to use computers and other technology to improve learning, productivity and performance– has become as fundamental to a person's ability to navigate through society as traditional skills like reading, writing and arithmetic. Although technology integrates rapidly in all spheres of human interaction, it seems that its potential for instruction within the Greek educational system has not been fully acknowledged and exploited yet. Teachers of different school subjects of the curriculum, on the other hand, have shown themselves to be generally responsive to taking up new pedagogical opportunities made possible by developments in technology.

The first attempts to incorporate computer technology in schools date back in the 60's and 70's. In the 80's, school children were using word processors, local networks and hypertext technology. Ten years later, classrooms have access to the internet and multimedia software is being widely used.

Modern computer-assisted learning programs need to provide for creativity and initiative on the user's part instead of rather tedious drill activities they used to do. Any attempt for computer-assisted instruction should be followed by a clear pedagogical framework.

As Reilly (1996) comments on the contribution the Russian psychologist Vygotsky's ideas about learning, "the tools we use both shape what we do and how we come to understand the world around us". The introduction of computer software and hardware within contemporary classrooms has provided students with alternative ways to express their world; their ideas are no longer printed words, they have become animations, video clips, drawings, pictures and other forms yet to be created. As a result of that, print is no longer the essential medium of expression. Images, videos and animations claim equal time and place in the 21st century school. If we want these

schools to prepare our children for the 21st century job market, then we should abandon the 19th and 20th century pedagogy. The world of the new millennium requires students to acquire a new type of literacy, to have the skills and access to tools that enable them to compose these new material instead of being the passive recipients of this information. This need and urgency for developing technological literacy, although not a new idea, emerged with greater emphasis in the early 1980's when *A Nation at Risk* (Gardner, 1983) cited computer competence as the fourth basic skill that was an important and empowering experience in the world in which we live since the skill was needed for both subsequent formal education, as well as for one's individual life experience.

It was not until recently that computers found their way into the Greek primary and secondary school classrooms. Under the suggestive name ODYSSEIA, the Ministry of National Education and Religion has undertaken a number of programs for the installation of computer hardware in three hundred secondary schools around Greece, as well as for the production and implementation of software for various school subjects.

LEXIPLOIGISSI seeks to create exploratory learning environments in which digital sound, image, text and video are fully integrated through the educational platform and placed under the direct control of users who are able to follow individual pathways through data stores. It is modular and comprises several modules for the lexicographic approach of terminology of the following six thematic areas:

- computer science,
- biology,
- economics,
- political science,
- fine arts education (including music and painting) and
- literature.

* The Institute for Language and Speech Processing has undertaken this project as the leading contractor and Kastaniotis Publications as a subcontractor. The first partner was responsible for the design, development and implementation of the educational platform, as well as for the provision of pedagogic scenarios of use; the second partner provided the resources (texts and multimedia material). The starting date of the project was June 1999, the development of the software and the collection of material lasted nine months.

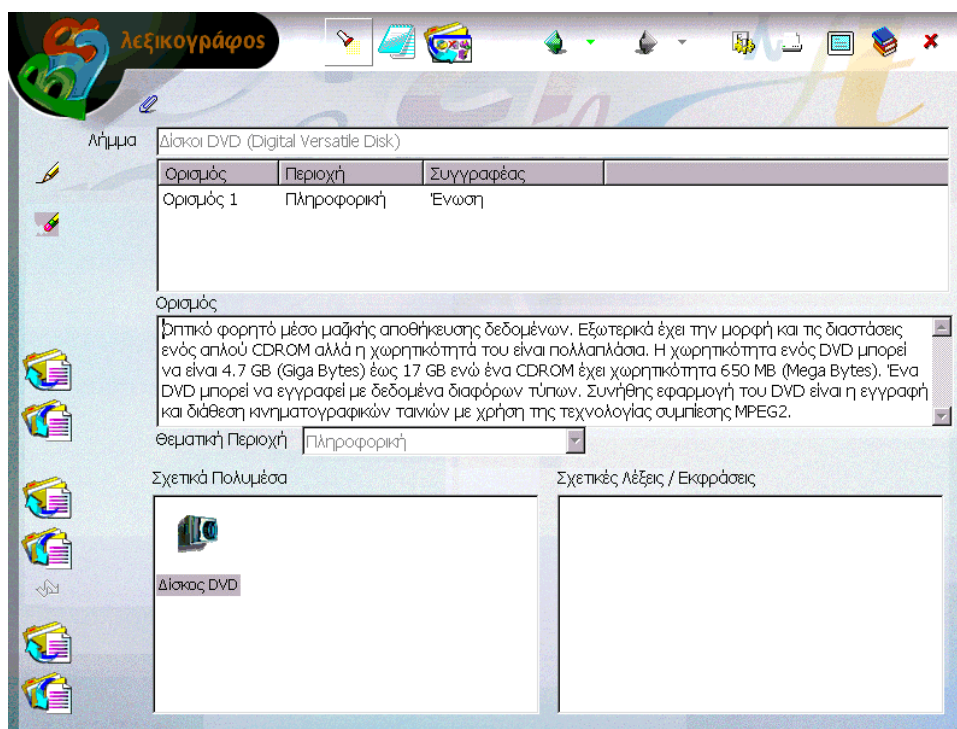


Figure. The DICTIONARY FORM

The Components of the Platform

The electronic dictionary is the main component of the platform. It encompasses 1000 terms-entries distributed in the above mentioned six thematic areas. The elements that have been included for each entry are the following:

- *thematic area(s)* (compulsory element)
- *definition(s)* (optional element)
- *related word(s)* (optional element)
- *link(s)* to text(s) and multimedia material from the library (optional element).

The second component of the platform is the multimedia library. It consists of almost four hundred texts, all written by specialists in the fields. It also comprises a number of literary texts so that the students can draw everyday and poetic meanings and definitions of the words for their dictionaries. In addition to texts, the database contains a substantial number of multimedia material: pictures, drawings, sounds animations and videos. Each object has been included with the following details:

- *object type* (text, picture, sound, video; compulsory element)
- *title* (compulsory element)
- *thematic area(s)* (optional element)
- *link(s)* to dictionary entries (optional element)

The third component is a database of exercises that gives users the opportunity to consolidate their knowledge in the different areas by testing their semantic comprehension of the terms. The elements that have been included for each exercise are the following:

- *thematic area* (compulsory element)
- *grade or unit of instruction* (optional element)
- *type of exercise*: multiple choice questions, right/wrong and filling in blanks (compulsory element)

- *link to dictionary entries* (optional element).

All the above components of LEXIPIOIGISSI operate on a local school network and require a server and a number of terminals for the students to work. The final component of the platform is an internet site to which all schools around Greece have access. It will offer students the opportunity to exchange language resources in the form of definitions of terms, texts and exercises, as well as audio-visual material and to comment upon each others' contributions.

LEXIPIOIGISSI is a modern platform that offers young users the opportunity to link the information presented in one database to material of another database, there by enriching the learning experience. The magnitude of the data to be stored is practically unlimited, comprehensiveness and interoperability across the databases have been seriously taken into consideration. The rest of this section is a detailed account of the components of the platform and the navigation within them.

Dictionary

Most of the ergonomic features that are presented in this paragraph for the LEMMA SEARCH FORM, apply to all search forms to be presented in the next paragraphs.

To consult a dictionary entry, the user opens the LEMMA SEARCH FORM. Then s/he selects one or more of the following search criteria to locate an entry or a set of entries:

- *Thematic area*. The program automatically produces a list of all existing thematic areas. The user can select an item from the list, or leave it unspecified to obtain lemmas from any thematic area.
- *Author name*. The program automatically produces a list of all users that created at least one lemma. The user can select an item from the list, or leave it unspecified to obtain lemmas from any author.

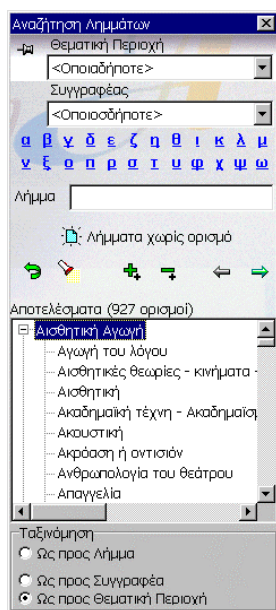


Figure. The LEMMA SEARCH FORM

- *Lemma prototype*. This field is a "description" of the lemmas the user is looking for. It can, for example, be a part of it. Wildcards are fully supported and are represented in the query by the '%' character. More than one wildcards can be used simultaneously.

The user can also select how the list of entries would appear on screen. The default option is for the words to appear in alphabetical order; they can also be grouped under the name of the author(s) or under the thematic area(s).

As an example of a searching task, the user could request all the entries of Biology that s/he has inserted starting with the "ac..." prefix. Moreover, s/he can specify that they are to appear in alphabetic order. After having made all the required choices, s/he presses the 'execute' button and the list appears in a tree form. A printed version of that list can also be obtained. Additional buttons enable the user to have a full extension of the list or to stretch it, to move from one entry to the next as well as to clear the form from all his choices and restart.

The search form can appear and disappear from the screen

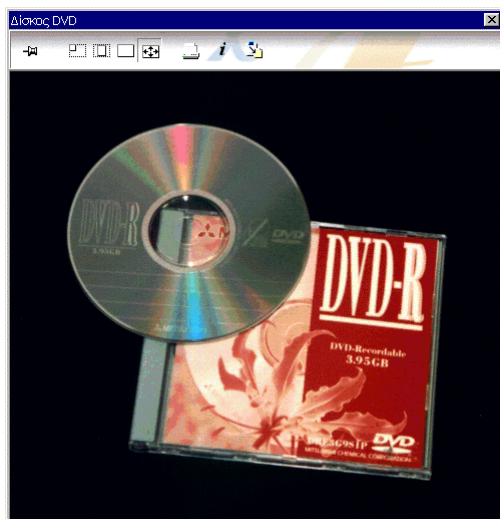


Figure. The MEDIA VIEWER FORM

anytime, as well as move around. Moreover, an "always-on-top" option ensures that the search form will remain visible even when the focus changes to a different form.

Anytime the user selects an entry from the list, the following information appears on the screen in the respective fields of the DICTIONARY FORM: name of author, thematic area(s), definition(s), related words, texts and multimedia material. When the user chooses another definition, the fields are automatically updated. A small marker is used to show which of the related words from the list constitute separate entries. By clicking upon them, the user can move to that entry.

Different buttons are used to denote the texts and multimedia material linked to each definition; each one of them is followed by a title. By double clicking upon each of them, the user can read the texts (in MS-WORD format), watch the animations, videos and pictures and listen to the sounds. Full support for such multimedia files is provided by the MEDIA VIEWER FORM.

Definitions are provided for half the entries of the dictionaries. Both the definitions as well as the texts supporting them are written by specialists in the respective fields and are meant to be used as models for the students to add their own material. The distribution of definitions in the respective areas is the following:

Thematic Area	Definitions
Literature	80
Computer science	85
Fine arts	80
Economics	80
Law	80
Biology	95

The user can insert a new entry by typing in the respective field. The program will automatically insert this entry under the name the user has given on entering the program. All users can create, delete and alter the entries they have inserted themselves but not those of other users. The entries of the publishers can neither be deleted nor altered in any way. If a user wants to alter them, s/he can create a copy of the definition under his/her name.

The user can also add, delete or alter definitions, thematic areas, related words and links to library material. To add a definition or a related word, s/he types the new information in the respective field and presses the 'enter' button at the end. In the same field s/he can make any alterations on existing definitions and words and press the 'update' button. To choose links from the multimedia database, s/he searches the objects by type and title; the

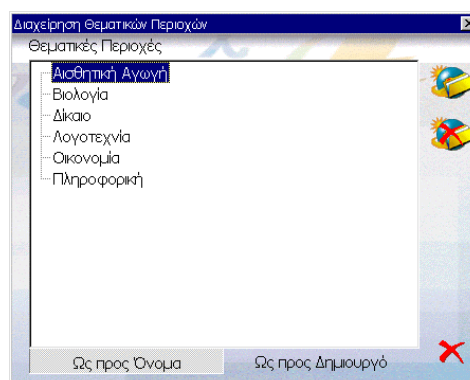


Figure. The THEMATIC AREAS FORM

link is inserted after pressing the respective button.

The platform enables the addition of new thematic area(s) by opening the respective form. The user can type the new thematic area or make alterations to an existing one provided s/he has inserted that area him/herself.

Library

The MEDIA SEARCH FORM includes most of the ergonomic features described for the LEMMA SEARCH FORM.

To consult an object from the library of multimedia material, the user opens the MEDIA SEARCH FORM. Then s/he selects one or more of the following types of search of an object or list of objects:

- *Type of object*: text, video/animation, sound, picture;
- *Thematic area* from the list that appears on the screen;
- *Author name* from the list that appears on screen;
- *Title* of the object (or any part of the title).

The user can also select how the list of objects would appear on screen. The default option is for the objects to appear according to their type; they can also be arranged under the name of the author(s) or under the thematic area(s). An example of choice: the user wants to consult all the entries of biology and literature written by himself starting with a and c and wants them to appear in order of thematic area. After having made all his choices, s/he presses the 'execute' button and the list appears in a tree form. A printed version of that list can also be obtained. Additional buttons enable the user to move from one object to the next as well as to clear the form from all his choices and restart.

Anytime the user selects an object from the list, the following information appears on the screen in the respective fields: type of object, name of author, thematic area(s), entry (entries) to dictionary to which this object is linked. When the user chooses another object, the fields are automatically updated.

The material already present in the library is distributed as shown in the table.

The choice of the material was made by specialists in the respective fields and they are meant to be used as models for the students to add their own material. The user can insert a new object by selecting the appropriate file (.doc, .jpg, .wav, etc) and typing a title on the respective field. In the case of a picture, the user can add comments on the available field. The program will automatically register this entry under the name the user has given on entering the program. All users can create, delete and alter the entries they have inserted themselves but not those of other users. The entries of the publishers can neither be deleted nor altered in any way.

Thematic Area	Multimedia Content
Literature	60 texts
	20 pictures
	1 video
Computer science	30 texts
	25 pictures
	3 videos
	2 sounds
Fine arts	50 texts
	15 pictures
	2 videos
	2 sounds
Economics	40 texts
	15 pictures
	1 video
Law	20 texts
	12 pictures
Biology	40 texts
	40 pictures
	3 videos

Table. Multimedia material already present

Exercises Component

To solve some exercises, the user opens the EXERCISE SEARCH FORM to locate and retrieve an exercise of a set of exercises. S/he can specify search criteria by one or more of the following ways:

- by selecting a *thematic area* from the list that

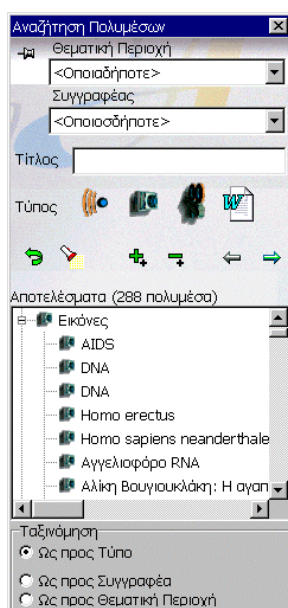


Figure. The MEDIA SEARCH FORM

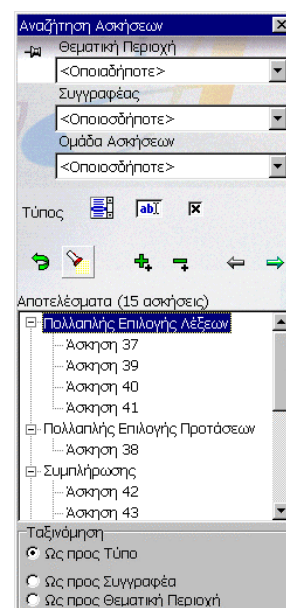


Figure. The EXERCISE SEARCH FORM

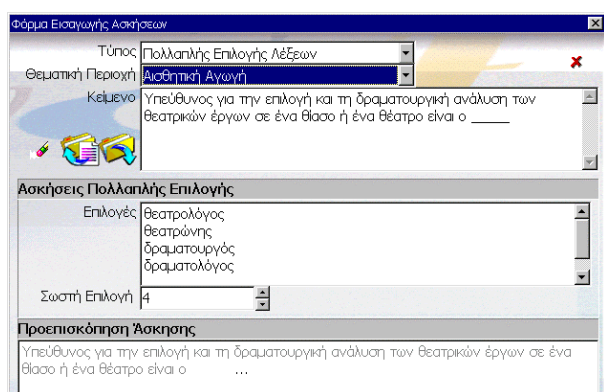


Figure. Inserting a new exercise

- appears on the screen;
- by selecting the *grade or unit of study* from the list that appears on screen;
- by selecting the one or more *types of exercises* (multiple choice, filling in blanks and right/wrong);
- by selecting the *level of difficulty* (easy-medium-difficult);
- by selecting the *name of the author* of the exercise; and
- by selecting an *exercise group* from the list of defined ones.

When the user presses the 'execute' button, the list of exercises that match the search criteria appears at the bottom of the page.

The user can start solving the exercises one-by-one storing the answers while still being able to review and alter them. After s/he has completed the whole set, s/he presses the 'OK' button to submit the answers and view the results. There is an optional button linking each exercise to the dictionary if the user needs to consult a specific entry.

An important feature of the program is the support it provides for inserting new exercises at any moment. Moreover, by the use of exercise groups, it can be of significant assistance to the preparation and carrying out of courses. An *exercise group* is a collection of exercises (of any type). The program allows the user to define any number of exercise groups.

Internet

It has already been mentioned that an essential component of the platform is the one running on the internet. The bulk of the material of the dictionary and the multimedia database are also available on the internet. The search forms, however, are much simpler. They allow search by selecting a lemma or a multimedia object through an alphabetical list or by typing it. All the material can be saved on the local program.

Material can also be transferred from the local server to the internet. New dictionary entries, definitions, texts and pictures can be saved on the internet. However, to guarantee the quality of the material available, only the system administrator is allowed to add material using his/her password. Each school can make alterations to the material they have added and insert comments to the material added by other schools.

The incorporation of the internet component offers additional advantages in building instruction delivered via

web-databases. Mainly, the platform can be used to form a virtual community, where participants in remote locations can exchange resources in electronic formats.

User Administration

Each user of the LEXIPLOIGISSI system is supplied with a login and a password. This information is required each time the user enters the system and must be supplied to the LOGIN FORM.

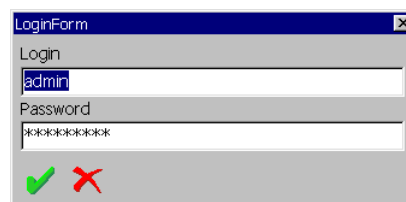


Figure. The LOGIN FORM

All new entries and modification to the database contents performed by a user are automatically monitored by the system in order to protect his/her work against accidental alteration or even removal. Thus, when new information is entered in the database, the system implicitly stores information of the issuing user. This information is then used to decide whether to permit or deny any subsequent attempts to update or remove this information.

Generally, the only person that can change or remove some data from the database is the person that provided it. Data provided by the Publishers can neither be removed nor altered in any way.

The USER ADMINISTRATION module is addressed primarily to the system administrator but also to the teachers in each school. Through this module:

- New users can be defined;
- Users can be removed;
- Password-related tasks can be carried out like, for example, changing a user's password (knowledge of the original password is required), setting a new password in the case a user has forgotten the original one;
- A list of all students in a class can be obtained, etc.

Notepad

At any time, each user has access to his/her personal NOTEPAD FORM. It is a separate form that can be opened/closed, moved around, "stay-on-top" of other forms, etc.

This form can host various types of information, private to each user, arranged in different tabs:

- *General notes*: The user can keep some general notes;
- *Lemma-related notes*: The user can keep separate notes for each lemma;
- *Marked lemmas*: A list of lemmas the user marks to facilitate their retrieval;
- *Marked multimedia*: A list of multimedia the user marks to facilitate their retrieval

Copying and pasting to or from the clipboard is also possible as well as printing of any tab.

The NOTEPAD automatically manages retrieving the appropriate information when the user logs in or navigates

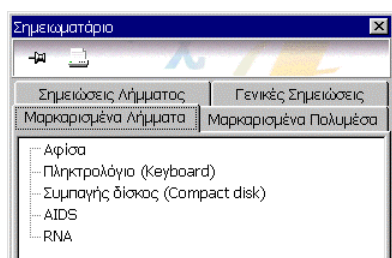


Figure. The NOTEPAD FORM

through the lemmas or media. Saving is also performed automatically without required any special user intervention whenever the data in any of the tabs is altered.

Note: *A well-illustrated manual for navigation will be provided to teachers and students as well as a number of alternative scenarios of use and incorporation in everyday educational practice.*

LEXIPLOIGISSI and the Users

The purpose of LEXIPLOIGISSI is to provide students with a supportive environment and a number of easy-to-use tools that will enable them to go beyond just cruising and finding to interpreting and transforming. The language resources available on the platform are open to discussion, commenting and evaluation. Additionally, they are designed to serve as models for the users to add new material (thematic areas, dictionary entries and definitions, texts and multimedia material) as well as exercises) This openness will also enable the schools to expand the use of the platform in all school subjects provided the respective material is added.

Recent research in the cognitive science has proved that knowledge is not passively received but actively constructed by learners from a base of prior knowledge, attitudes and values. Dependence on a single source of information, typically a textbook, must give way to using a variety of information sources (Wise, 1997). This fact has led to a reappraisal of teaching practices. Technology came more rapidly available and less expensive to find its way to Greek schools and ensure that new approaches to teaching gain a firm foothold in schools.

Nowadays the world is full of futuristic stories of students accessing the internet in their schools or home computers trolling for information they need for their study and projects and communicating with their peers all around the world. This relatively free access to all kinds of material would require equipping them with the necessary critical abilities to interpret and judge productively and

strictly this information. In LEXIPLOIGISSI the information accessed via the internet had been distilled by the instructor responsible in every school. This provides additional guarantee for the quality of the material added in the site.

The most innovative element of LEXIPLOIGISSI is that it matches high standards of hardware in a software for educational application; it provides its users with state-of-the-art tools that enable them to understand, organise and classify meanings and terminology in a number of scientific area. Young learners will be trained to evaluate the language resources available to them, enrich and complete them with their own material; in this way, they will remain active participants in the leaning process and take a keen interest in their school subjects. The program will also promote collaboration among students working either in the same environment or in different schools.

On the part of the teachers, LEXIPLOIGISSI gives them the opportunity to apply computers to support instruction in their grade level and subject area. They can plan and deliver instructional units that integrate a variety of language resources. In addition to the already existing material, they can insert their own adapted to the level and the needs of their audience. The lessons developed with the help of the platform can reflect effective grouping and assessment strategies for a diversity of student population. To quote Wise (1997) on the role of the teacher in the new technology era: "More than in the past, teachers must become advisors to students inquirers, helping them to frame questions for productive investigation, directing them toward information and interpretative sources, helping them, to judge the quality of the information they obtain, and coaching them in ways to present their findings effectively to others. This will require teachers to become even better prepared in the content of the subjects they teach, and the means by which the content can be taught and learned".

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