# Interactive multimedia teaching environment for history and art explorative study by the use of historical sources

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#### Abstract

The present contribution demonstrates the study and design of educational software for High-School History and Art. The shoftware is an instructional tool "KASTALIA" for explorative investigation of historical and art knowledge by the use of historical sources. The study and the implementation is carried out by our research team in the framework of the program "NAYSIKA" supported by the Greek Ministry of Education.

The software offers the students a computer supported learning environment suitable for historical subject representation and leads them to the formulation of arguments and reasoning contexts for constructing their own narration. It provides historical data, a variety of tools (note-pad, sketch-pad, glossary, virtual museum, data-base search and processing tool) for the elaboration of historical sources and a job-area for the study of chosen topics of knowledge domain through scenarios, activities and jobs incorporated, by the authors or by the teacher, in the educational software. Additionally, this software supports network comunication for cooperative work between students or teachers in the same or different schools.

The evaluation of the software in real classroom conditions is considered very important for the final version of the software.

### **Key-words**

Educational software, historical sources, explorative investigation, instructive tools.

### **1. EDUCATIONAL PRINCIPLES**

Models of learning have radically evolved during the last decades. The development in Cognitive Scienses and in Information Technology has resolutely contributed in that evolution [5][7][8][17[[18].

The answer to the question: «How do humans learn?» differ according to the theoretical approach that is chosen for learning. The present suggestion accepts the model of constructivism as nuclear of its approach in learning. Although this approach does not constitute a strictly cohesive-linear theory of learning, however, it provides a total of work admissions-hypothesis, which they allow the procession of innovated teaching approaches. We can summarize our admissions for learning and teaching as follows:

- The student is not a receiver, but an active constructor of his knowledge.
- The acquisition of knowledge requires not only learning of the environment in which knowledge is produced and operated.
- Learning is not a static situation, but a ceaseless occurrence.
- The student is not a "white paper", but he carries in educational and learning act his own needs, experiences and previous knowledge. They often are incorrect or non-acceptable from the scientific point of view.
- Knowledge and adroitness are being acquired more effectively in authentic real world environments.
- The possibility of multiple representations' development for the same phenomenon, situation, etc., the possibility of the student to research his environment and his collaboration with other persons that are involved in the same activity are elements that provide the construction of knowledge.
- The selected challenge of cognitive collisions creates suitable conditions for acceptance and acquisition of new knowledge (conceptual change). Cognitive collisions are situations where the student comes face to face with his own ideas and the results of his own reasoning and he finds out that his ideas lead to incorrect conclusions.

### **Selection of the Topic**

Research held by Cognitive Phycology has shown that students usually face difficulties in understanding scientific terms due to missconceptions, mistakes, cognitive collisions, inactive knowledge and contradictions.

Research on the methods of teaching History in class, according to Didactic of historical knowledge[2][14][15][16], has proved that: The main difficulties that students face are related to the understanding of historical terms, the placement of historical events in space and time, the proposition of multidimensional causative relationships, the considering of every event as a unique «product» of a society. They also face difficulties in understanding that historical studies not only political, military or diplomatic events but the every day life of people of an epoch.

Traditional teaching of history disregards the use of historical sources. On the other hand the use of not clear and consequently not comprehendable historical terms, limits the ability for the students to understand the real nature of the historical knowledge and leads them to form an unscientific perception of what history is.

The chosen topic refers to unities that are related to exploration and comprehension of social and political organization, as well as art in Ancient Greece.

The originality of these topics is consisted in the fact that they can be studied through the use of the historical sources and they can be represented by the use of interactive multimedia[4].

### Instructional and learning goals

The instructional and learning goals of this software are considered satisfactory when students are able: [14][15]

- to apply the principles of Historical knowledge on concrete social and political topics
- to develop criteria of historical sources elaboration.
- to consciously face democracy as basic element of the organization of social and political life.
- to comprehend historical terms.
- to place historical events in space and time.
- to propose multidimensional causative relationships.
- to comprehend the historical event as entity in space and time.

## **Educational design methodology**

Within this theoretical framework, the design of educational software should be based on a series of principles, which emphasize the student's active involvement in authentic activities, that correspond to real world processes (situated/anchored learning) [3][20]. Moreover, the software should support a student's creative activities within a pedagogical framework, allowing him to control his own learning procedure, and providing him with help and guidance when this is necessary [11][12][13].

- There must be acceptance and encouragement of students' initiative.
- The answers that students give, must lead the flow of the lesson, and change the teaching strategy and the specific knowledge content to be taught.
- The teacher has first to examine how his students understand a concept, and then to share with them his own idea for the specific concept.
- It is good for the students to be encouraged to collaborate with the teacher and their classmates and make research based on open questions.
- The teacher must not be satisfied with the first answer of a student to a question, but he must ask for clarifications, in order to understand in depth the student's ideas and conceptions.
- The teacher, when possible, has to lead his students to experience contradictions to their existing convictions, and encourage them to discuss about them.
- The "mistake" is very important during the learning process, as it allows the teacher to explore the ideas of his students and to search ways for the improvement of these ideas.

According to these guidelines, we should design educational environments that put students into situations that permit the construction of structured knowledge rather than trying to put knowledge into students' head[1][4][6].

## 2. DESCRIPTION OF THE SOFTWARE

The software offers:

- Instructional material that contains historical sources:
  - 1. fragments of acts of Ancient Greek authors, texts of newer histoirians' approaches, historical terms and biographies.
  - 2. images of Ancient findings (pots, coins, inscriptions, buildings, sculptures)
  - 3. historical maps
- <u>Tools</u> categorizised in:
  - 1. *Study tools* for historical material elaboration, information searching and keeping notes like the note-pad, the sketch-pad, the glossary, the virtual museum, the students workbook and the data-base search tool.
  - 2. Instructive tools distinguised in:
    - Instructional scenarios that are referring to topics and are suported by activities and jobs either proposed by the software or created by the teacher
    - Tools for software enrichment with new sources or scenarios
  - 3. *Network tools for communication and elaboration* like electronic-mail, text chat, application sharing.
- <u>Job area</u> that has been designed in a way that resemples the «historian's table», the area that carries all the features for performing the elaboration of historical sources within a familiar to the students environment.

## **3. TOPICS**

The study of the Archaic world using the historical sources is realized through the following topics [22][24]:

- 1. Archaic Corinth Mediterranean commercial city
- 2. Archaic Athens the foundation of democracy
- 3. The Archaic Corinthian and the Archaic Athenian art

We present the first topic and we describe in details a proposed representative activity.

**Topic 1: Archaic Corinth – Mediterranean commercial city**[9][10][19][23]

## Instructional goal

The instructional goal of this topic is to help students become familiar to the methods of historical investigation and to cultivate the historical thought. Students work on the scenarios of this topic performing activities in an attractive and prototype environment where they construct their knowledge. We consider very important the contribution of the teacher to the evaluation of this environment after its application in real classroom conditions.

Scenarios	Activities		
1. Geographic area of early Archaic	1.	Identification of the sources	
Corinth (end of 8 <sup>th</sup> B.C. century –	2.	Searching and exploiting sources' information	
begin of 7 <sup>th</sup> B.C. century)			
2. Early Archaic Corinthian society	1.	Civil organization of Archaic Corinth (early	
(end of 8 <sup>th</sup> B.C. century – begin of		stage)	
7 <sup>th</sup> B.C. century)	2.	Social organization	
	3.	Economy of Archaic Corinth (early stage)	
	4.	Social crisis	
3. Changes in administrating the	1.	Civil changes during the Archaic stage (2 <sup>nd</sup> half	
geographic area - Development of		of $7^{\text{th}}$ B.C. century – $1^{\text{st}}$ half of $6^{\text{th}}$ B.C. century)	
the Ancient City (poli-kratos) – The	2.	Systematization of colonization	
solution of social crisis (2 <sup>nd</sup> half of	3.	Expansion of communications – Development of	
$7^{\text{th}}$ B.C. century $-1^{\text{st}}$ half of $6^{\text{th}}$ B.C.		commercial activities	
century)	4.	Changes in administrating the geographic area	

## **Teacher's role**

The teacher can choose a scenario (that is included in the software or has been created by the teacher) and propose an activity to his students. While the students are working on the activity he intervenes to reorientate them if they incline from the desired target. He guides them to use the provided by the software historical material and the offered tools.

## Student's role

The student is working on the activity performing the relevant jobs that are included in the electronic work-sheet. Within the learning environment the connected to the activity historical material as well as the work-sheet are at the student's disposal. The student following the instructions of the work-sheet is engaged in answering the questions, trial that includs: search for the right historical source, elaboration of the historical source (reading, finding the meaning of words and historical terms in the glossary, searching for information and use of it), selection of information in the note-pad, drawing up on historical maps within the sketch-pad.

## Activity 1: Identification of the historical sources

**Jobs:** The relevant to this activity jobs are the following:

- Mark the name of the author of every source.
- Mark the work this fragment comes from.
- Arrange the sources according to the form and the kind they belong to.

- Place the sources on a timeline using the glossary.

The student using the instructional tools completes the followig map:

Source	Author	Work	Form	Kind	Time
Source 1					
Source 2					
Source 3					
Source 4					

### Description

The screen presents the scenery on the background and the five icons (refering to text) of the historical sources of text that are connected to the activity, as well as the instructional tools. By clicking on an icon the corresponding to the source window is opened. The window includes the text of the source with explanatory comments (in hypertext format) and hotwords refering to the glossary. By clicking the corresponding tool, the work-sheet is opened. Following it's questions the student can perform the activity using the note-pad and the sketch-pad, and refering to the glossary, the virtual museum and the data-base search tool. The student:

- keeps his notes in the note-pad, copies from the source's window and pastes the desired piece of text or image information to it, formulates, stores or prints it.
- transfers a map on the sketch-pad and draws lines or mark- points on it.
- looks up for the meaning of words and historical terms in the glossary.
- can explore the virtual museum in a less guided way
- can search for historical material in the incorporated data-base using the data-base search tool by defining search-criteria.
- completes the work-sheet.



Job area, work-sheet



Sources' windows, use of note-pad



Use of sketch-pad and glossary

	ΚΟΡΙΝΘΙΑΚΑ ΝΟΜΙΣΜΑΤΑ
NATURAL DE LA CONTRACTA DE LA	
<u>i</u>	

Virtual museum and show-case of Corinthian coins

## **4. EVALUATION**

The formative evaluation of the software KASTALIA took place in the Franco-Hellenic Lyceum «Saint-Paul» from students of the second year. The students participating follow theoretical studies and according to the curriculum «Social and political organization in Ancient Greek» is included.

The formative evaluation was organized in two phases:

During the first phase the students worked out on the educational scenarios of the first topic: «Archaic Corinth- Mediterranean commercial city», without the use of computers. The questions and the corresponding sources were given to 22 students on hard-copy. They worked in the class and in cooperation with their teacher.

The teaching goals of the first phase were to observe:

- if the questions of the activities are clear and intresting
- if the scenarios help students to become familiar with the methods of historical investigation
- the reactions of the students to a different method of working

The results were taken into consideration in the reconstruction of the scenarios.

During the second phase of the formative evaluation of the software, 8 out of the previous students worked on the scenarios of the first topic for 6 hours.

The teaching goals of the second phase were to estimate if:

- the software is acceptable from the students and interesting
- the software offers the students an attractive and prototype environment to construct their knowledge
- the software offers friedly tools and interface

- the scenarios help students to become familiar with the methods of historical investigation and cultivate historical thought

A summary of the conclusions obtained from the second phase of the formative evaluation are given below:

- The majority of the students were fully satisfied. They found the software an intresting, attractive and friendly tool to construct their knowledge.
- All the students consciously understood/perceived the meaning/conception of the «identification of the historical source», its components and the way of «reading» it.
- Exercises demanding observation and action (like filling work-sheet, underlying items, drawing on maps) were met with enthusiasm, whereas theoretical or conclusioning exercises seemed to be of low interest.
- They gave their remarks for some tools of the software (as the sketch-pad), the interface and the navigating in the viltual museum.
- They also expressed the difficulties they faced in understanding certain meanings asking for more details.

The students' detailed remarks are taken into consideration for the final version of the software.

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