



## Geoquest Vesuvius an Interdisciplinary Role Playing Game

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### Abstract

*The educational technology is based on the idea of using language which is closer to pupils to improve the teaching/learning process. The game seems to be a perfect vehicle for education, even more when it's a cooperative game, since the acquisition of knowledge and enhancing skills now requires more actual approaches. The use of tablets, smartphones, social networks, etc. is more comprehensible and funny for young people compared to traditional media.*

*We have already realized a role playing computer game called GeoQuest creating at the same time a Role Playing Engine which involves all students into the game through their personal mobiles or tablets giving a total interaction of the whole class with the game. The outcome of the class experimentation were excellent, both for didactic and educational results obtained.*

*The different student roles allow to everyone to enhance their own skills and are perfect for a full inclusion of Special Education Needs (SEN) students.*

*This article is focused on our role playing game experience with the pupils. The students go through a virtual environment, which is progressively discovered by their choices.*

*This game story is set under the Somma-Vesuvius volcano. The environment that gradually reveals itself to the players is full of significant elements that can be traced back to a volcanic site, inserted in a specific geodynamic situation. It is located in the Mediterranean area, in Campania region, close to Pompeii and Erculaneum, where there was compressive and divergent geological events, which produced differentiated magmas and explosive volcanism. Players can also discover where they are from the story of some historical and mythological figures they meet on their path. They can interact to solve several quests appearing during the game related to mineralogy, volcanology, geodynamics, history, myths.*

### 1. Introduction

We would like to create new educational materials for teachers to effectively respond to the latest methodological guidelines and regulations. It can be really helpful to provide structured, accurate and easy to use educational materials. The aim of the work is to use the latest ICT techniques to create innovative educational products. Our primary topics were Earth Sciences, History and Mythology all together in a unique interdisciplinary approach. We have already realized a first role playing computer game called GeoQuest creating at the same time a Role Playing Engine which can be easily applied to create new didactic games for the whole class.

### 2. The game

GeoQuest Vesuvius is a class interactive role-playing computer game which goal is to teach Earth Science.

The participants live a graphic adventure in which they face several choices of different paths with different opportunities. Furthermore, often the students must solve questions or quests to go on.

In role-playing games, players do not know where they are and the map of the location where they virtually move. Everything is revealed as players proceed: different choices create a new original game experience. Through a path choice or as output of some questions, the players change the experience.

In our game the players-students of a class meet some mythological and historical figures along the way. They tell their story introducing the player in an atmosphere of mystery and dramas.

The myths and stories belong to the place and time in which the game is set, and these are correlated to the path the players will reconstruct.



Fig.1. Class role playing game

While the path is revealed through the stories heard by mythological characters, players proceed and find some clues to discover a final event. The clues are based on scientific evidence, mineralogy, volcanology, geodynamics, history and myths.

## 2.2 The Adventure

The adventure begins in a dark forest. There are no clues to understand where they are and so the students are now screened in a mystery story and they have to decide how to proceed. Players follow rough paths through the Valley of Hell, slopes of a volcano; face the pitfalls of scoriaceous lava flows, meet characters of fantasy, as Amelia, the enemy of Scrooge.

This game story is set at Somma-Vesuvius volcano. The environment that gradually reveals itself to the players is full of significant elements that can be traced back to a volcanic site, inserted in a complex geodynamic situation. It is located in the Mediterranean area, in Campania region, where there have been compressive and divergent geological events, which produced differentiated magmas and explosive volcanism.

Players may discover where they are also from the story of the characters on their path.

The humanistic way of this work plots historical, mythological and literary aspects through appropriate textual references. This shows the mythological and geographical origin through the work of Strabo and other ancient authors, not only of "Sterminator Vesèvo", but of the whole Campanian volcanic plain. Is intertwined here, the myth of the loving marriage between young Vesèvo and Capri, and then it connects the mythological origin of Herculaneum area through the narration of the hero, who seems has named the entire area: Hercules. There are ad hoc episodes and literary references on the propulsive force of the mythological hero about the described places. The chosen literary passages are not chronological, but transversal and diachronic sort of story in the story, aimed at connecting knowledge of the students with the gradual pace of the game.

Large space is dedicated to the eruption of 79 AD through the sources by Pliny and the references by Tacito: the anthology section is focused both on the volcanic event description, as perceived by his contemporaries, and the educational material of the scientific topics inserted into the game, with a clear exposition. We would like also emphasized that the excerpt of literary passages chosen are taken from great narrative calibre sources. The work of Pliny, in fact, also in the coming centuries has been used by historians and scientists as essential reference of volcanic event, because it is considered direct evidence unfiltered by the passage of the next memory.



There are, also, the connections with the representation of Dante's Hell Valley with some of its mythological characters; the place found by Dante corresponds to the area affected by the path of magma and, as happened in the first part of our work about the Campi Flegrei [2], references borrowed expressly from Comedy are perfectly functional in educational objectives. As a "frame" we put in the game specific elements of art history and historical events.

### 2.3 The Questions

The questions are in the form of multiple choice, so players can proceed even without detailed knowledge of the matter. In this way the game facilitates the participation of all and avoid feelings of

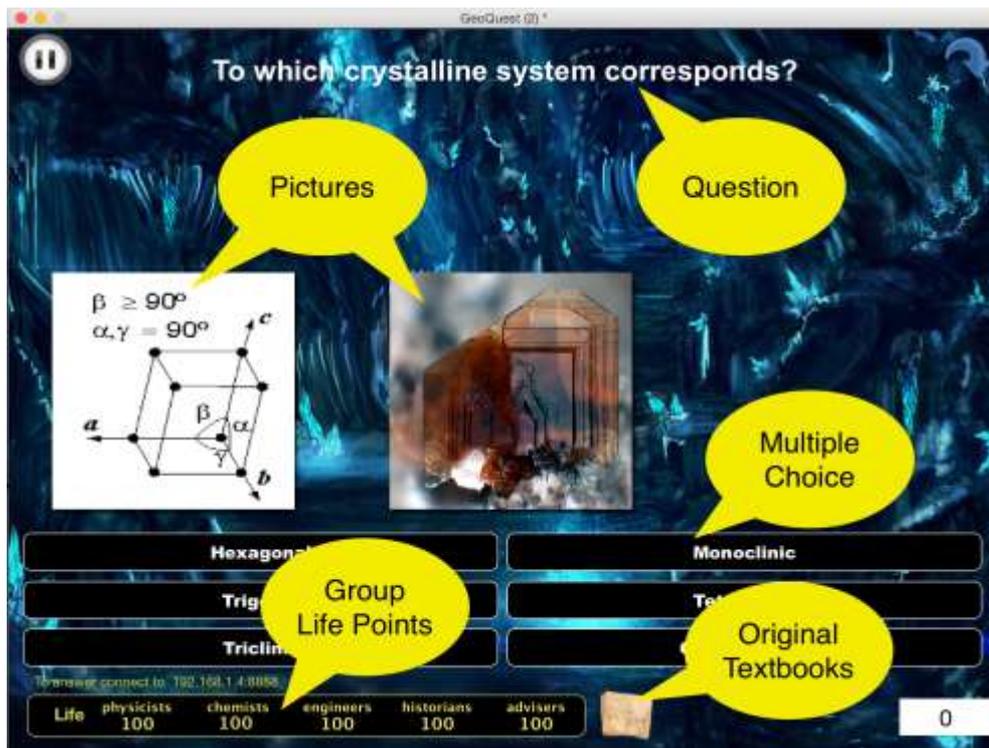


Fig.2. A question

frustration related to the lack of prerequisites.

Players respond individually with their smartphones or tablets, but the system [1] proceeds according to the criterion of the majority, to demonstrate the collective responsibility. At the same time each player can evaluate their own results, regardless of the decision of the majority.

If the response of the majority is not correct, the system displays the error and the right answer, but still continues in the path, to not break the rhythm of the game and the students' attention.

There are also Scientific and Humanistic questions during the game, to enhance its interdisciplinarity.

The questions of mineralogy are enriched with photos taken in the most important mineralogical museums in the world, so students can appreciate perfectly the shape, the crystal habit, the color of the mineral.

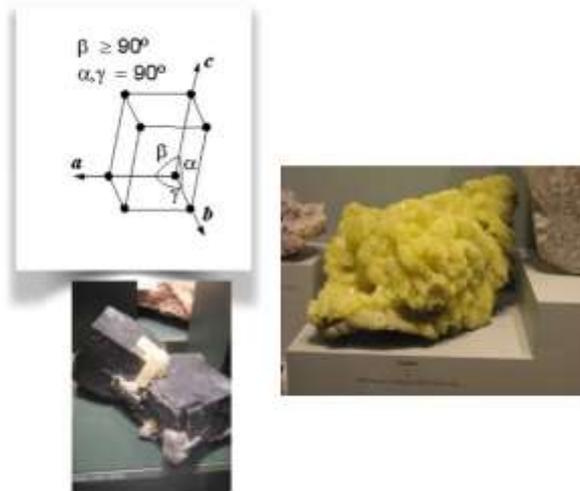


Fig.3. Minerals and Crystal Lattice

A good classification of minerals allows players to be able to recognize the mineralogical association and then go back to the rock they are going through.

### 3. Game features

Students have freely access to materials that they found along the way, including original texts created on purpose, as notes about mineralogy, petrography and volcanology.

Their consultation is easy and immediate since it's realized as synthetic PowerPoint presentations or PDF files full of icons and pictures. [2]

The mineralogy and petrography notebook contains atlas on the physical and chemical properties of minerals. Each crystal system is described in its basic characteristics and complemented by images of its minerals.

Texts are spoken by an high quality synthesised computer voice in several different languages, so it is perfect for CLIL compliance.

Sound effects enhance the sensations during the gaming and there are several recited classic texts and original music tracks (diversified communication codes).

The students interact with the system using their own smartphones and tablets with a new technology [3] which collects the individual answers. Students can follow their personal score, related to their role in the game, on their devices.

The game can be followed by the whole class with a IWB (Interactive White Board) or a projector.

It can be played in a laboratory to accomplish one or more hands-on activities or in a classroom simulating a workshop activity.

The students are divided into groups, to give them special roles in scientific research (chemists, physicists, historians, engineers, advisers).

The system gives distinct scores to each group based on the "weight" question has for the different roles played.

The path of play can be followed by students with different levels of knowledge and skills using the note book as compensatory measures. The iconographic contributions, the use of different communication codes (visual and auditory) and the structuring of the questions are ideal for a personalized didactic, even in the case of Special Education Needs.

### 7. Conclusions

Roleplaying helps students to reach their goals easily through cooperation; unlike other games or virtual paths, which are carried out individually by each student/player. With our game, class group must cooperate since each one is assigned a "role" regarding the various different branches of science: in this way, students may also understand the importance of working together to reach a complex goal.



Through role play, students are engaged by initial mystery, so they have to explore the virtual environment to go on, explain in a scientifically rigorous way the results of their explorations, stimulating independent research on the context studied.

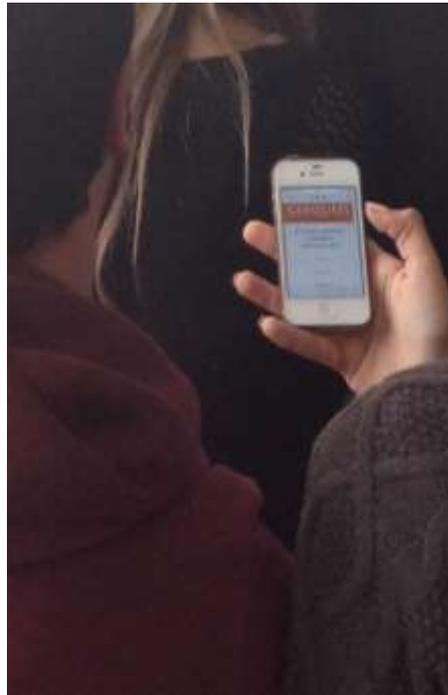


Fig.4. Playing game with smartphone

## References

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