Geophysics on stage: bringing Earth into scene

The INGV science theatre experiences

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We do believe in education!
“All the world is a stage. And all the men and women merely actors”

W. Shakespeare - As you like it

“Il teatro ha origini molto lontane. E’ una tecnica di svelamento che la sapienza egiziana già possedeva. Il teatro è vita in economia”

Leo de Bernardinis

*Geophysics on stage...Lanza T. et al. Tiziana.Lanza@ingv.it*
Since September 2008 the Laboratorio di didattica e Divulgazione Scientifica (INGV – Rome) has started to experiment science theatre as an innovative tool to promote seismic risk awareness and Earth education.
Up to now we implemented two projects:

1 - Readapting of an ancient Sicilian myth, Colapesce, to be performed in a school theatre by pupils aged 6-10 ys (II-IV Primary School F.Di Donato in Rome).

2 - A pilot project developed in collaboration with Ente Parco dei Castelli Romani and with the help of students aged 16 (Classical Lyceum III A and B, Socio-Pedagogical Lyceum F of Mancinelli & Falconi Institute in Velletri) concerning the possibility to establish in the future an Ecomuseum in one of the Lazio Region areas rich of natural landscapes and history.

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Science can be conveyed via narratives and this represents a reliable way to transmit scientific contents to people. An evaluation has been done in a school context with encouraging results (Negrete & Lartigue 2010).

Also Myths and Legends are a type of narratives and have a structure familiar to most people. They are particularly precious for Earth education. Early human civilizations used myths to organize and convey information for transmitting the wisdom necessary to live in harmony with and survey in nature (Lanza & Negrete 2007).

An excerpt from Apocalypto - A story from a wise village elder

"The greatness of a nation and its moral progress can be judged by the way its animals are treated." - Mahatma Gandhi

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Once upon a time a fisherman...
Sept 2008 - March 2009

Participants:

II Primary school: (pupils aged 6-8)

IV Primary school: (pupils aged 8-10)

XIX Week of the Scientific Culture
27 March 2009

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One upon a time...

Renato Guttuso The Legend of Colapesce – Volta del Teatro Vittorio Emanuele II – Messina Sicily

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The script: highlights

We readapted the story to include a modern scientific content acted by the IV primary school pupils (9-10 yrs) starring INGV seismologists.

A seismometer was part of the plot and brought into scene by the young scientists who discussed about it with the legendary King of the Colapesce Fairy tale who believed it was a bomb!

Little fairies allow scientists to go back in time....

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Evaluation

The evaluation process aimed at verifying:

• if the project promoted the seismic risk knowledge

• And encouraged the acquisition of individual and social behaviour for risk preparedness

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Evaluation tools

• 1 Duss Fairy tale test (adopted for the 6/7 ys schoolmates)
• 2 Semi-structured questionnaire on the Colapesce story (for the 9/10 ys schoolmates)
• 3 An open form for the teachers’ evaluation of the whole experience

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Results 1 II class students

We note that the graph concerning the group collaboration presents the highest negative scores

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Results 2 IV class students

We note that the 93 per cent of the students have a good seismic knowledge, while only the 7 per cent seems to have acquired a seismic risk awareness.

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Results 3 - Teachers’ evaluation

The teachers gave a positive feedback about the whole experience as an efficacious way to transmit scientific content but suggested to involve more the children in the script writing and in the setting. The IV primary students have reinforced their knowledge about earthquakes thanks to the experience of dramatisation.

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Towards a Castelli Romani Ecomuseum
Oct 2009 – May 2010

Participants:

Classical Lyceum III A: in charge of the performance

Socio Pedagogical Lyceum III F: In charge of the Evaluation

Classical Lyceum III B: checking group

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The Ecomuseum

Is a museum without walls that focuses on the identity of a place, it is based on local participation and refers to a new idea of it that involves the whole cultural heritage in opposition to the focus on specific items and objects, performed by traditional museums

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Ecomuseums in the Lazio Region

Ecomuseo dell’Agro Pontino

http://www.ecomuseoagropontino.it/

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Carta escursionistica del tour dei Castelli Romani
a cura dell’Uff. Comunicazione dell’Ente Parco dei Castelli Romani

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We subdivided the itinerary into three items

1) the Roman Ships Museum
2) The Lake itself
3) Diana temple.

- The first is a museum devoted to the ships that Caligula the Emperor ordered to built (37-41 b.C);
- The lake is of volcanic origin as the whole area and its emissary is an example of roman engineering (V-VI b.C.)
- Diana Aricina Myth together with The Rex Nemorensis are linked to fertility;

From a naturalistic point of view: aquatic birds as grebes, cormorants, pochards, coots.
Vegetation as reeds lake, chestnuts, mimosa

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Albani Hills Volcanic Complex: the three historical phases….

Caldera della fase Tuscolano-Artemisio: 580-330 ka

Fase Idromagmatica: 200-36 ka

Caldera della fase Campi di Annibale-Faete: 330-200 ka

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Whorship places

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Towards the performance

1) Choosing the itinerary
2) First inspection on the itinerary places
3) Attending the lessons concerning the geophysics of the area, the history, the myths and legends, and the naturalistic aspects
4) Organizing the material in a creative way to write down the script for the performance
5) Preparing the performance
6) Performance on the places of the itinerary during the European Day of the Parks (24 May 2010)

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Evaluation

We asked the Socio-Pedagogical Lyceum (III F) to perform the evaluation.

We wanted to verify to which extent the lessons we gave and the tools and methodologies proposed were efficacious in transmitting to the students of the Lyceum Classicum (III A) new knowledge, skills and values.

We acquired the data and an elaboration is still in course. But we can already suggest some general conclusions.
Evaluation tools

1 - **Opening questionnaire**, substituted by one submitted to a checking group (Classical Lyceum III A)

2- A **direct and guided observation** during the final performance to detect several indicators

3- **Ending questionnaire**, aiming at detecting the changes occurred in the students participating in the project
Results

It is evident by comparing the results of the ending questionnaire with the opening one that the project contributed to increase the participants’ knowledge of the area in any sense: geologically, historically, culturally.
The public feedback

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Conclusions 1

Even if the ending questionnaire showed good results with respect to the acquiring of new knowledge concerning the territory, the student ability in working in a multidisciplinary context, their ability in writing the script and in performing it and at the same time the ability to cooperate in order to transmit the acquired knowledge to the public during the final performance we should nevertheless remark that:

Comparing the two experiences, it is evident to us that while in the case of the primary school the involvement of the schoolmates was complete, in the second case only a small group of students of the III Classical Lyceum charged to produce the performance participated actively.
Conclusions 2

It is of great importance when we decide to use theatre as a science education tool to have at our disposal teachers of several disciplines and several hours to be dedicated not only to the content transfer but also to the dramatization. Our experience suggests that it is better to involve the students in all the different phases that will bring to the performance, even in the evaluation process. If it is true that a knowledge transfer is guaranteed, the same cannot be said for the development of a seismic risk awareness that requires more commitment. The same is for the students’ approval, especially for those of the secondary school. Innovative way to gain students enthusiasm should be thought even if our experience suggests that dramatization could be a privileged way to convey Earth education, seismic risk and the love for the environment.

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Suggestions

- Victor Turner (1986) From Ritual to Theatre: The Human Seriousness of Play -
  http://www.earth-prints.org/handle/2122/5862

- http://www.tizilanza.net/Ecomuseo.html
- http://www.youtube.com/user/EcomuseodeiCastelli
- http://www.parcocastelliromani.it/

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