H.F.R.I.
Hellenic Foundation for Research & Innovation

Description of the funded research project

1st Call for H.F.R.I. Research Projects to Support Faculty Members & Researchers and Procure High-Value Research Equipment

Title of the research project:

Educational Seismology for school and society: A multidisciplinary approach through innovative theater education methods and digital technologies

Principal Investigator: Dr. Ioannis Kalogeras, Researcher A’

Reader-friendly title: **EduSeismArtTec**

Scientific Area: Natural Sciences – Geo-sciences

Institution and Country: National Observatory of Athens - Greece

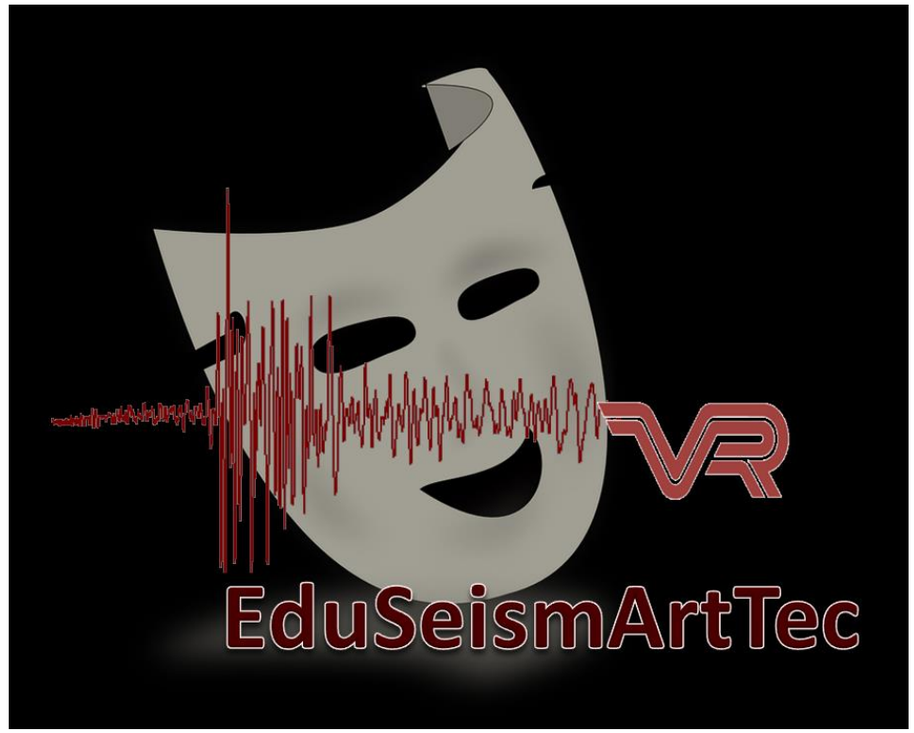
Host Institution: National Observatory of Athens

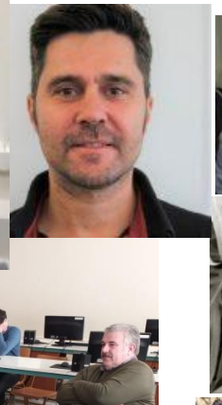
Collaborating Institution(s):
University of Peloponnese – Dept. of Theatre Studies
University of Eastern Attiki – Dept of Electric and Electronics Engineering

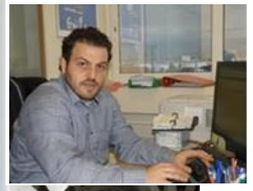
Project webpage: http://eduseismarttec.gein.noa.gr

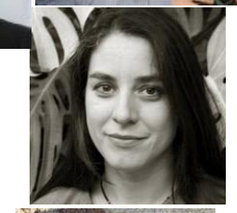
Budget: 199.826€

Duration: 36 months









Research Project Synopsis

The Eastern Mediterranean region is characterized by high seismicity, with impact on human activities and infrastructures. Reduction of the economic and social impact of earthquakes requires the development of seismological research, the education of population for resilience and the improvement of the State response.

In this context: a) the seismological institutions actively participate in raising awareness and popularizing the concepts for understanding the disastrous earthquake phenomenon in extended population groups; b) students and teachers are population groups that can have a role in reducing the impact through the educational process and diffusion of knowledge; c) earthquake protection measures are a set of rules that can be followed individually, with the Educational Seismology having a social dimension (in the short and long term); d) Educational Seismology expands into Citizen Seismology, where a trained for earthquakes citizen becomes an observer and reports reliable information to scientists, who process them and provide valuable information to the State for immediate response to affected areas. Theater in education, already widely recognized as a mean for the formulation of individual human behavior, the development of critical thinking and human socialization, enables a variety of experiential approaches to sensitive or demanding subjects and challenges. When drama is combined with the use of modern digital technologies, such as virtual reality or the combination of real actors and digital agents in hybrid events, it allows for innovative, multi-disciplinary approaches of education on the earthquake phenomenon and resilience, whereupon the school becomes a source of information forwider population groups.

Within the framework of the proposed project, NOA-IG, as research and operational State institution in the field of Seismology, cooperates with UPEL-DTS to introduce and exploit theater education in Educational Seismology and with UEA-DEEE for the integration of innovative multimedia and communication techniques in this process.

Project originality

In summary, the innovation of the present project lies: (i) in the introduction and exploitation of Theatre Education and experiential theatre pedagogy in Educational Seismology and (ii) in the embedding of combined physical / digital / virtual components in these educational activities, through Virtual and Mixed Reality technology, aiming to maximize the learning outcomes, the motivation and engagement of the learners and the dissemination of knowledge on earthquake seismology from school to society.

Each of the three key areas mentioned above (Educational Seismology, Theatre Education – Experiential Theatre Pedagogy, Digital Multimedia Technologies of Multidimensional / Virtual Reality) constitutes in itself a recognized and mature field. In relation to the present proposal, the challenges are identified in their combination, with the focus to the earthquake phenomenon:

The indicative open research questions to be addressed by this project are as follow:

- Is the experiential theatre adaptation approach strong educational intervention to overcome the stereotypes about the earthquake?
- Will it work just as effectively towards adults, dissipating towards society as it is expected to succeed with the age group of students?
- How can the learner "be guided" in the earth interior and "see" how an earthquake develops through the Education Seismology?
- Will the attractiveness of digital technology for young people change the inherent negative attitude towards the earthquake?
- Does the combination of the theatre play with Education Seismology elements really enhance the motivation and engagement of students?
- Is it able to ignite a genuine interest for the science of seismology in students, and if yes, what is the best method to assess results?

Expected results & Research Project Impact

It is known that citizens who are informed on a natural or technological hazard behave better concerning the risk: the scientists are typically expected to address the general public and transmit scientific knowledge in a popularized manner of form. Less known, however, is the reverse route, i.e., the earthquake observation and reporting of evidence (photos etc.) from the citizens to the scientists, given that the scientists are usually not present on the seismic spot while citizens are more likely to be either on the spot or in the vicinity of it.

Apart from the destruction pictures taken on the spot, which are evaluated in combination with the measurements by seismic activity monitoring instruments and result to the quantification of seismological concepts, the way that citizens feel the natural phenomenon provides socio-psychological information useful in order to improve the education of the population (population-at-risk management). The above describes the transition from scientific seismological knowledge to educational seismology and further to citizen seismology

The implementation of the project is expected to have significant benefits for science, economy and society. The combination of research methods and theoretical assumptions from Seismology, Theater Education and the use of modern digital technologies will create new perspectives for the subject of Educational Seismology. Keeping children and adults informed about the earthquake phenomenon through experiential theatrical education methods will prevent or at least limit the individual behavior of panic, resulting in savings of state resources relevant to the earthquake effect management. Raising the awareness of citizens against the earthquakes, through their participation in theatrical and pedagogical actions, is expected to result in their cognitive, emotional and mental strengthening against the natural phenomenon. Furthermore, the proper preparation of citizens for the savvy and prudent treatment of the earthquake’s consequences ensures their smooth cooperation and eventually social cohesion.

The importance of this funding

- In addition to the funding of the research and scientific staff of the host and the collaborating Institutions, 2 IT positions for external partners are created for the needs of the project. Their main object will be the parameterization of the equipment and the development of internet methods of diffusion of knowledge (Educational Seismology) and reception / evaluation of the observations on the effects of earthquakes (Citizens' Seismology).
- The equipment aims to: a) the uninterrupted flow and incorporation of information to and from the researchers, for the dissemination of Seismology knowledge and the effects of earthquakes, especially for cases of high seismic activity, when the internet traffic is increased, b) the application of multimedia 2D / 3D digital techniques in combination with theatre education, c) the technical support of the theatre performance as one of the deliverables for the development and dissemination of the methods and results of the project, d) the development of educational means for the popularization of the science of Seismology and e) the support of distance learning and tele-cooperation between the host institution (EAA-GI) and distant school units.
- The theatre performance, the imprint and digital material, the participation in conferences and the submission of articles in scientific journals and the consumables serve the implementation of the project and its deliverables to an audience that extends beyond the educational community.

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