



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: Innovative Physical Activity Games for Physical and Cognitive Development

Principal Investigator: Marios Goudas

Reader-friendly title: PA-CoDe

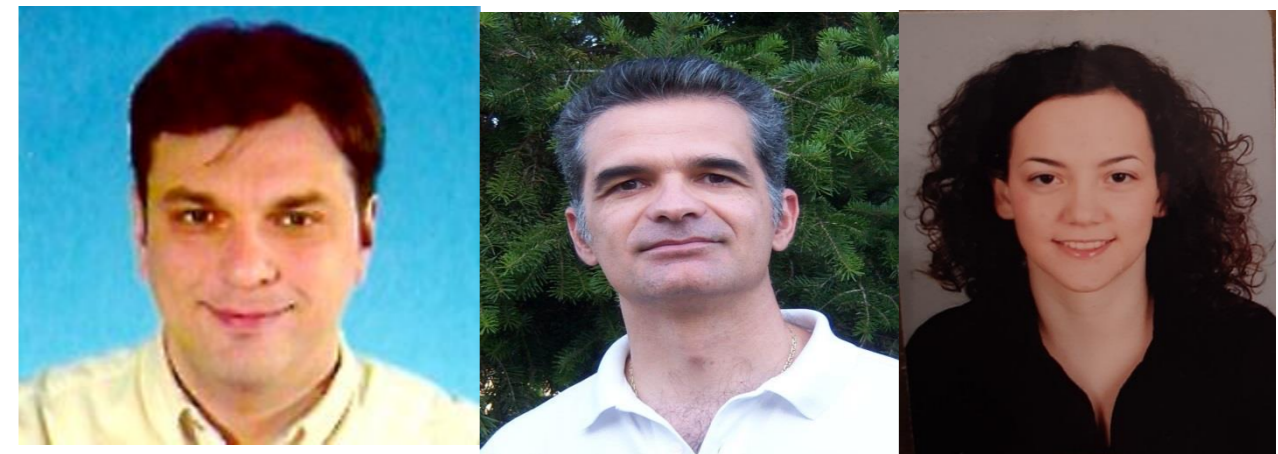
Scientific Area: Educational Sciences

Institution and Country: Greece

Host Institution: University of Thessaly

Collaborating Institution(s):

**Project webpage
(if applicable):**



Budget: 80.400

Duration: 36 months

Research Project Synopsis

The project involves 3 phases

- a. **Design, implementation and evaluation of an innovative Physical Education program based on Physical Activity Games for challenging students' Executive Functions and increasing their Physical activity. This phase involves three acute field experiments and a long-term intervention. Regarding the acute field experiments, three types of games, based on three different principles of mental engagement: contextual interference, mental control, and discovery, will be compared to traditional Physical Education activities regarding their impact on three Executive Functions (Inhibition, Working memory, and Cognitive flexibility), volume of Physical Activity and students' enjoyment with the lessons. Based on the results of the three acute experiments, a long-term intervention will be developed, applied and tested for the effect on students Executive Functions and Physical Activity.**
- b. **Developments of educational materials (Contents book, Implementation guide, Training the Trainers' guide).**
- c. **Dissemination of the results in the scientific community and of the educational materials in the educational community to promote scientific knowledge and increase Physical Education teachers awareness regarding the potential of Physical Education to enhance students' physical and cognitive development.**

Project originality

The proposed work is based on innovative and state of art theoretical perspectives for the role of Physical Activity interventions in promoting students' holistic development including health, cognitive, and socioemotional outcomes.

Adopting the approach of “moving with thought and fun” the novel aspect of this program is the use of innovative PA games for promoting students' Physical Activity and triggering their Executive Functions instead of using simple fitness routines and aerobic exercises involved in most previous Physical Activity interventions.

This approach has many advantages. Specially designed games are particularly suitable for developing students' physical and motor coordination and their Executive Functions because they involve them in unpredictable conditions requiring problem solving and setting challenges and mental demands. Indeed, Executive Functions are optimally developed when students are involved in cognitively complex Physical Activity experiences and novel, challenging, diversified but not highly repetitive and automatized tasks. Such task should be designed following all three principles of mental engagement, highlighting contextual interference, emphasizing mental control, promoting discovery. Thus, innovative PA games can provide students the opportunity to get involved in PA that is not only physically effortful, but also cognitively, emotionally, and socially engaging.

This project, based on the abovementioned principles and methods, is developing an innovative Physical Education program which will positively affect students' cognitive and motor development.

Expected results & Research Project Impact

The project expands our knowledge regarding the effects of a cognitively challenging Physical Activity intervention on students' physical and cognitive development in Physical Education settings. Moreover, this project will provide evidence regarding the types and the characteristics of Physical Activity games and activities that are most appropriate for challenging students both physically and cognitively. The results of the proposed work will also inform PE curriculum development providing new insights in designing high quality PE programs for enhancing students' cognitive and physical development. This process will enhance the quality of the educational provision.

Students who participate in this project will benefit from increasing their Physical Activity and enhancing their Executive Functions through enjoyable games and activities. Having positive experiences from their participation in Physical Education students may develop positive attitudes for life-long participation in Physical Activity.

An integral part of the proposed work is to disseminate the results of the program and the educational materials produced in educational community for multiplying the potential positive effects. Special emphasis will be given in the production and dissemination of ready and easy to use educational materials for implementing the PE intervention in school settings. PE teachers from local and regional school settings will be trained through workshops to use these materials and implement the program in their schools. These actions will contribute to improvements in the quality of PE and enhance PE teachers' professional practice.

Prospective economic benefits will also emerge by the implementation of the PA intervention in large scale resulted from the dissemination plan included in this project. Physical Activity has been associated with positive health-related outcomes. In contrast, physical inactivity with its associated morbidity of health disorders set a substantial burden on societies and health systems. Physical inactivity results in a significant cost due to lost workhours, productive years and health-care costs. This economic cost may be saved if appropriate policies for increasing PA, such as those included in the proposed work, will be adopted.

The importance of this funding

Funding from the Greek Organization of Research and Innovation was mostly welcomed after a long period with very limited opportunities to attract research funding from Greek sources. This funding was timely for the expansion of my research activity in this area, which, besides being well cited, has been limited in scope due to a shortage of funds. Additionally, funding of a phd candidate provides one full time job for three years to a highly qualified person and at the same time will enhance the international visibility of my research.



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COMMUNICATION

185 Syggrou Ave. & 2 Sardeon St. 2
171 21, N. Smyrni, Greece
+30 210 64 12 410, 420
communication@elidek.gr
www.elidek.gr