


Ionian University

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Type of organisation:

SME School University Public Authority
 Training No Profit NGO

Other (Specify)

Fields of action:

SMEs Youth Universities Public Authorities
 Equal opportunities Schools Unemployed

Other (Specify)

Description of the organisation

Ionian University has five Faculties which are made up by a total of 12 Departments located in four islands of the Ionian Sea namely Corfu (7 Departments), Kefalonia (3 Departments), Zakynthos (1 Department) and Lefkada (1 Department). The Faculty of Environment is made up of two Departments namely the Department of Environment (located on the island of Zakynthos) and the Department of Food Science and Technology (located on the island of Kefalonia).

The project proposal will be mainly supported by faculty members of the Department of Environment as well as collaborators from another tertiary education institution (Department of Chemistry, National and Kapodistrian University of Athens- NKUA).

The Department of Environment of Ionian University accepts approximately 120 – 140 undergraduate students every year and offers a B. Sc. degree in Environmental Science. The undergraduate study program lasts four years (8 academic semesters) and covers a wide range of thematic areas related with aspects of the natural environment. These thematic areas include environmental chemistry and physics, waste management and treatment technologies, environmental monitoring and assessment, environmental management – ecology and sustainable development, environmental informatics, renewable energy sources, environmental policy and education, science education, environmental economics and environmental impact on works of art. The study program is being implemented by ca. 17 academic staff members 14 of which hold a permanent position. One of the active research groups of the Department of Environment is the one conducting research in science education (with emphasis in chemistry education).

The main researchers of the group are Prof. Dionysios Koulougliotis, Dr Katerina Paschalidou and Dr. Katerina Salta. Dr Paschalidou and Dr Salta hold a position as laboratory teaching staff at the Department of Chemistry of NKUA. Recently, the group was enriched by a Ph. D. candidate who explores the role of optical representations in biology textbooks.

Experience of the organization in previous European projects

The Department of Environment at Ionian University was actively involvement (as partner) in two European Projects related with chemistry education during the period 2010-14:

2011 – 2014: Life Long Learning Programme, Comenius Sub-Programme: Chemistry is All Around Network
The project was funded by the European Commission (DG Education and Culture). The main aim of the project was to disseminate and exploit the best strategies to implement Life long Learning of scientific subjects, with a focus on Chemistry identified as an exemplary case study. (<http://chemistrynetwork.pixel-online.org>)

2010 – 2011: Life Long Learning Programme, KA 1 Sub-Programme: Chemistry is All Around Us
The project was funded by the European Commission (DG Education and Culture). The main aim of the project was to identify of the best strategies to implement Life long Learning of scientific subjects, with a focus on Chemistry identified as an exemplary case study
Website: (<http://www.chemistry-is.eu/>)

In addition, there has been a postdoctoral project (associated with the Department of Environment of Ionian University) funded by the Greek State Scholarship Foundation during during 2017-19 and which was related with the role of web-based tools in secondary chemistry education

Experience and Expertise of the organization in the project's subject area

Our expertise and experience which is closely related to the project subject is focused in the following areas: a) Green Chemistry and sustainable development. In more detail:

- i) the development of modern tools for evaluation of the achievement of the principles of Green Chemistry in chemistry laboratory teaching practicals,
- ii) the evaluation of students' awareness of Green Chemistry principles,
- iii) the characterization of the students' written argumentation related with the subject of materials' recycling and
- iv) the development of laboratory teaching experiments which reveal socio-scientific issues related with environmental challenges,

- b) Exploring the achievement of meaningful learning via systems thinking in the domain of organic chemistry
- c) development and implementation of educational materials and
- d) teacher training.

Contributions that can be provided to the project

The Department of Environment at Ionian University will contribute to the development of an Inventory on complex systems implementation in academic training (IO1) that will raise awareness academic decision-makers and lecturers on the importance of planning and implementing complex systems teaching through an interdisciplinary approach. Moreover, it will motivate the academic teachers to implement degrees, curricula and courses on the matter to improve the employability of undergraduate students.

It will also help to the development of a toolkit for implementing an interdisciplinary approach to sustainable development teaching (IO2) providing Higher education lecturers with methods and operative teaching sources to be useful in teaching Sustainable Development related issues according to interdisciplinary approaches.

Finally, it will contribute to the adoption of a Joint Curriculum in Sustainable Development (IO3) engaging Higher education decision-makers, experts and lecturers in defining a shared complex systems and system thinking based interdisciplinary learning path and related curriculum in Sustainable Development and build on them to reach agreements on Double and Joint Degrees.

The 10 years' experience in the field of our research group guarantees the successful actualization of the project aims.

Reasons of involvement in the project

We are interested in getting involved in this project because it will promote undergraduate students' competences related with complex systems thinking, thus adding significant value to their education and substantially increasing their employability. Employers will benefit since they will have the possibility to hire professionals that have increased ability to tackle complex problems by adopting a more holistic approach.

In the long term, the project outcomes will benefit the national strategies related with circular economy and sustainable development since their successful realization requires individuals who have mastered the ability for complex systems thinking.

Contact Person's Experience and Expertise

Dr. Koulougliotis holds a Ph. D. in Biophysical Chemistry and since 2010 he has been active in educational research related mainly with science education. The research activities in which either Dr Koulougliotis or one of his close collaborators have been involved (from 2010 till today) and which are relevant to this project are the following:

a) Green Chemistry and Sustainable development. There have been four publications in conference proceedings (1 international and 3 Greek) which are related with the following issues: i) modern tools for evaluation of the achievement of the principles of Green Chemistry in chemistry laboratory teaching practicals, ii) evaluation of students' awareness of Green Chemistry principles via the implementation of the Web-based Inquiry Science Environment in Greek secondary schools, iii) characterization of the students' written argumentation related with the subject of materials' recycling and iv) development of laboratory teaching experiments which reveal socio-scientific issues related with environmental challenges.

b) Systems thinking. There have been 3 international publications (one in journal and two in conference proceedings) related with the achievement of meaningful understanding via systems thinking in the organic chemistry domain.

c) Development and Implementation of educational materials. There have been eleven publications of which 9 in conference proceedings (1 international and 8 Greek) and 2 in international journals. The educational materials involve laboratory practicals, web-based applications, novel teaching approaches (eg. exploitation of socio-scientific issues), educational scenaria and they are related with different science fields (chemistry, nanotechnology, etc).

d) Teacher training. There have been six publications in conference proceedings (5 international and 1 Greek) related with issues of teacher continuous professional development such as the design of training programs, successful practices and learning communities.