

ABSTRACT ISSUE

UNIVERSITY OF IOANNINA

2016



époque

Ioannina

May 20-22, 2016

International conference

**Environmental Portfolio for
Quality in University Education:
Best Practices in/for social-
economical and environmental
Sustainability**



International conference

Environmental Portfolio for Quality in University Education: Best Practices in/for social-economical and environmental Sustainability

Abstract Issue, 2016

Organizing Committee

@ Formal and Informal Science Education (@FISE) Researching group of the University of Ioannina, Greece

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The ÉPOQUE project (n° 2014-1-EL01-KA200-001373) has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

The coordinator of the project EPOQUE, Katerina Plakitsi, Associate Professor of Science Education, at the Department of Early Childhood, School of Education, University of Ioannina, in close cooperation with, University of Helsinki, University of Naples, Hellenic Open University, BEST Institute and Project in Motion (PIM) welcome you to the International conference

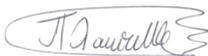
***"Environmental Portfolio for Quality in University Education: Best Practices in/for social-economical and environmental Sustainability"
Ioannina, Hotel du Lac, 20 – 22 May 2016***

The project ÉPOQUE promotes a smart specialization of prospective teachers, scientists and engineers through an environmental portfolio ready to be integrated into the university syllabuses. It creates a new generation of green teachers, green scientists, green engineers in the context of higher education modernization agenda connected to SMEs and organizations (including schools).

The conference aims to stimulate reflective discussions to change policies in Universities, as well as to promote change in social, economical and environmental aspects of society.

ENTRANCE FREE – NO REGISTRATION FEES

The President of the Conference



Katerina Plakitsi, UOI, Greece

The Partners

Emilio Balzano, Università degli Studi di Napoli, Federico II, Italy

Jarkko Lampiselka, Helsingin Yliopisto, Finland

Achilleas Kameas, Hellenic Open University, Greece

Karin Kronika, BEST Institut für berufsbezogene Weiterbildung und Personaltraining GmbH

Stefan Schaa, Projects in Motion, Malta



Friday, 20th May

Friday, 20th May

h. 17:30-19:00, Dodoni Room, The EPOQUE project Symposium

S1. The EPOQUE project and its intellectual Outputs: A new University Agenda

Katerina Plakitsi, University of Ioannina, Greece

Jarkko Lampiselka, Helsingin Yliopisto, Finland

Emilio Balzano, Università degli Studi di Napoli, Federico II, Italy

Stefan Schaa, Projects in Motion, Malta

Achilleas Kameas & Theodoros Panagiotakopoulos, Hellenic Open University, Greece

Claudia Beck, BEST Institut für berufsbezogene Weiterbildung und Personaltraining GmbH

The project ÉPOQUE promotes a smart specialisation of prospective teachers, scientists and engineers through an environmental portfolio ready to be integrated into the university syllabuses. It creates a new generation of green teachers, green scientists, green engineers in the context of higher education modernisation agenda connected to SMEs and organisations (including schools). This way it aims to change the European policies about the connection of higher education and also adult learning. The ÉPOQUE project builds on the ERASMUS INTENSIVE PROGRAM LIGHT carried out at the coordinating institution for three years. Due to the previous experience, the project has a great impact to the regional development using tertiary education as a vehicle to achieve the Epirus regional priorities for convergence. The project produces a set of courses, comparative studies, teaching manuals and an EnMS for schools.

The partnership consists of 6 different institutions. Coordinator is the University of Ioannina integrating in its strategic planning the Environmental Portfolio and its academic recognition (UOI). Expert in the field of developing environmental university courses for teachers is the University of Helsinki (UOH) through its HENVI Center as well as the Teacher Education Department. Expert in the developing of e-courses and adult learning provider is the Open University of Patras (OUP). Adult

Friday, 20th May

learning provider and expert in Quality of Assurance Plans is the BEST. The PiM from Malta provides an EnMS applied for enterprises (including schools). Finally, the University of Naples contributes with the implementation of the University Courses as well as by giving its great experience to integrate tools like an EnMs in formal and informal learning.

Good structures and practices will be exchanged between European North and South. Also, excellent researching groups collaborate to tailor some good Finnish environmental practices to the Mediterranean settings contributing to the regional development and help the countries with the financial crisis to recover. Apart from the formal partners there are many associated partners linked to the project like regional principals, financial agents as commerce, environmental oriented NGOs and, finally, green schools networks.

The ÉPOQUE project activities are:

- Development of a new joint set of university courses for all participated institutions, focusing to an interdisciplinary and international approach
- Period of “integrated mobility”, where the participated students attend a common course, parts of which are been taught from different partners in/of different countries
- 5 international meetings for the management and the implementation of the project
- 1st pilot period= mixed students’ mobility combined with a set of ten days of real mobility as well as two months of virtual mobility for the preparation and continuity of activities
- 2nd pilot period = course embedded students’ mobility, with internship in enterprises (including schools) and development of a platform for collaboration between students, teachers, companies, for the max exploitation of results and the sustainability of the results beyond the two years and changes update
- Teaching and Lecturing , including the mixed students’ mobility
- Creation of the conditions for the integration of the course into the departments’ curricula, joint degrees or certification

Friday, 20th May

- Dissemination of the results and collaboration for regional development strategic planning with other organisms beyond the project partnership
- International Conference and 5 regional training workshops for the dissemination of the results

For the development of the courses we shall follow the Developmental Work Research (DWR). It is a set of methods developed by a research group led by Yrjö Engeström at University of Helsinki since the 1980s. The purpose of DWR is the collective transformation and development of work, technology, and organizations. Today the main method used in DWR is called Change Laboratory. It contains a set of instruments for both analysing problems, disturbances and ruptures in daily work, and to develop models and ideas for a new work practice.

The direct target group of the project are university students and adult learners, while the indirect one comprises of University professors and trainers. The already established networks of the partners will be used in order to disseminate information on the project at regional, national and European level, building thus a solid basis for the sustainability of the project. These stakeholders are Universities, teachers, scientists, engineers, regional principals, representatives of adult education and VET providers, career counsellors, civil society organisations, policy makers at local and/ or regional level, SMEs, associations, etc.

h. 19:00- 20:30, Efterpi Room, Parallel Session S2a

Chair: Chariton Polatoglou, School of Sciences, Dept. of Physics, Aristotle University of Thessaloniki

S2a_1. Sustainable development and university social dimension

Jenny Pagge, University of Ioannina, School of Education, Dept. of Early Childhood Education

Universities traditionally offer teaching, research and have social responsibility. Their impact on knowledge improvement, promoting innovation, supporting culture and information transfer, is enormous. They provide formal education and life-long learning courses for researchers, teachers, decision-makers and leaders.

Friday, 20th May

Considering the relationship of sustainability of higher education and social dimension, it is well established that sustainability emphasizes on ethical development without compromising the ability of future generations to meet their own needs. So, the sustainable and socially responsible universities turn out to be the major requirement in our society. These universities will provide an interaction between public and private organizations with a tendency to improve the quality of life in general. Additionally, they will support responsible co-operations with firms and other laboratories through selected activities for improvement of scientific knowledge, entrepreneurship and technological research. Thus, the Higher Education Institutions will become leaders of sustainability and implement new patterns for education and research.

Additionally, the sustainable university will include all environmental, economical, social and ethical issues to become leader and change driver. Some universities consider only environmental and economic issues as very important, since they are correlated with the application of technology and scientific research on commercialized products. Other universities consider social and ethical issues as the key activities towards social responsibility, creativity, culture, education and research. Apparently, university policy matters have to include in all aspects the social dimension, in order to have a dynamic evolution.

In conclusion, universities due to their characteristics, contribute to sustainable development and social responsibility, improving the quality of life and promoting the well being.

S2a_2. Students' perceptions of the quality of their studies

Chariton Polatoglou, Katerina Plakitsi and Anthoula Maidou, Aristotle University of Thessaloniki, School of Sciences, Dept. of Physics and University of Ioannina, School of Education, Dept. of Early Childhood Education, Greece

The quality of services is a matter concerning all organizations. During the evaluation of universities the level of satisfaction of students from their studies should be investigated as well, because studies are a very complex issue. A systematic effort in this direction was the measurement and management model SERVQUAL, which assesses the quality of

Friday, 20th May

services. SERVQUAL was also applied to evaluate the studying services provided by universities, because it was considered an appropriate tool to investigate the quality of studies. Originally SERVQUAL did not include sustainability issues, although today the environmental, societal and economic values are also important in the educational process. To augment SERVQUAL we have added a set of questions concerning sustainable development issues to SERVQUAL, and therefore the resulting tool is called SD-SERVQUAL. In this paper we present the results of the students' views of the Department of Preschool Education, University of Ioannina and the Physics Department of the Aristotle University of Thessaloniki, two different universities in different cities of Greece. By using the questionnaire SERVQUAL, we had to make some minor, but necessary modifications, in order to fit it into the Greek reality. From the utilization of SD-SERVQUAL and the analysis of the data we wanted first to see, if the implementation of this tool can be used to draw useful conclusions and if so, how these could be exploited to improve the quality of studies offered by the universities.

S2a_3. Analysis of the responses of faculty members of the Aristotle University of Thessaloniki concerning inclusion of environmental issues in their courses

Anthoula Maidou, Chariton Polatoglou and Katerina Plakitsi, Aristotle University of Thessaloniki, School of Sciences, Dept. of Physics and University of Ioannina, School of Education, Dept. of Early Childhood Education, Greece

Education for sustainable development (ESD) has been acknowledged as a major factor for increasing peoples' awareness to the problems our planet is facing as a host of life for many creatures and of course also for us. Therefore, many scientist and educators have repeatedly suggested the inclusion of ESD in all educational levels and in all subjects, as a means to stretch out the importance for everybody to take actions in the direction of sustainable ways of living. ESD has many subjects and can be approached through many ways, thus it can be included in all teaching courses.

Friday, 20th May

There has been a great effort from many universities around the world to include sustainability issues in many subjects and also to create sustainability interdisciplinary courses.

We wanted to find out if the university teachers of the Aristotle University include ESD issues in their teaching, and their stance towards these issues. Furthermore, we wanted to investigate their opinion about interdisciplinary courses as a means to enhance their students' ability for employment. For this reason, we used the on-line questionnaire designed by the EPOQUE team.

In this presentation we will focus on the outcome of Aristotle University faculty members' answers to this questionnaire. Although most of the university faculty members believe that the labor market has become sensitive to environmental issues, and that incorporation of environmental topics would enhance the employability of their students, most of them think, when asked about the incorporation of environmental issues in the courses they teach, that "some courses are available, but are rather theoretical" (38.5%), and the next mostly preferred answer was that "there are sufficient courses available which are of adequate quality" (23.1%), while others state that "not many related courses are available" (15.4%). As to the topics which should be incorporated in the university curricula, most suggest "alternative energy sources" (53.8%), and 46.2% would like to include "green technology", "recycling", and "basic impacts of environmental assessment".

S2a_4. Distance learning for the zero energy house as a short course for an environmental portfolio

Chariton Polatoglou, Stamatia Artemi and Anthoula Maidou, Aristotle University of Thessaloniki, School of Sciences, Dept. of Physics

Houses are usually not energy efficient and therefore not sustainable. This was and sometimes still is part to the way houses are built, i.e. without paying much attention to natural resources and the environment. Also most houses were built during a period where the environment was not considered an important issue, as it is nowadays. Houses are therefore a good starting point to introduce students to the

Friday, 20th May

subject of sustainable development, as they relate to the everyday experience of people. To educate students on the subject of energy sufficient and sustainable houses we have designed a short course which can be part of an environmental portfolio. The course is built on the LMS platform of Moodle and consists of modules which include experiments with everyday materials, simulations on the effect of natural resources on the energy efficiency of a house and examples of contemporary designs which promote energy efficiency and sustainability. On the other side, traditional houses since ancient times and around various places of the world were well adapted to the environment and had achieved sustainability, thus clarifying that bioclimatic architecture is not a new approach to the built environment, but rather a re-discovery of knowledge. Such paradigms, ranging from ancient Greek houses and traditional houses from different places around the world are presented and discussed. The short course uses the minimum amount of technical terms and utilizes the everyday experience of the students, thus it can be offered also to students with no prior science or technical education.

S2a_5. Endangered and protected fish species of Greece

Ioannis Leonardos, University of Ioannina, School of Sciences, Dept. of Biological Applications and Technology

The Greek inland water fish fauna probably is the most diverse among European countries in terms of endemic species. A total of c. 177 species have been recorded. Cyprinidae is the most dominant family with 86 species (48%) which occur in almost every kind of freshwater habitat. However, during the last years the production steadily decreased. This could be attributed to the ecosystem degradation, changes in the structure of fish populations through stocking of commercial species, introduction of alien species, pollution from urban wastes, agricultural, small scale and industrial activities, eutrophication, extinction of several native species and overfishing of commercial species. Solutions to address the problem could be achieved through education, knowledge about the protection of species and ecosystems as well as the emergence of the importance of the region on European biodiversity.

Friday, 20th May

S2a_6. Environmental tourism and biodiversity tourism in Epirus, Greece - perspectives of a new era

Vasilis Wooseas, University of Ioannina School of Education, Dept. of Early Childhood Education

Tourism is the fastest growing industry in a global scale. In 1950 merely 25 million people travelled abroad. By 2004 international travelers already exceeded $\frac{3}{4}$ of a billion and the forecast for 2020 is for 1.6 billion international tourists annually. In 2014 the industry accounted for 2.36 trillion US\$ of direct economic impact and 7.6 trillion US\$ of direct and indirect global economic contribution. The tourism sector is the largest common area of export income and foreign direct investment across the world, spreading wealth and jobs across economies, from richer to poorer, in a way no other sector can (United Nations World Travel Organisation).

Environmental tourism (also referred as ecotourism) is a fast growing sector of this growing industry. Ecotourism captured 7% of the international market in 2007 and the forecast is for much larger shares in the near future (up to 25% according to some estimations), as more citizens around the globe become environmentally aware (UN/Travel Weekly). It is often described as responsible travel to fragile and usually protected areas, for biodiversity watching. It educates the traveler, provides funds for conservation and directly benefits the economic development of local communities.

For centuries Epirus, the northwestern part of Greece, was isolated by the tall and angry looking Pindus mountains. Epirus remains one of the poorest regions of the EU (Eurostat 2015). Nevertheless, two new highways, Egnatia (already in use) and Ionia (to be completed in 2017), are taking this region out of isolation.

Benefited by the unique north to south orientation of Pindus valleys, that gave shelter to thousands of European plant species during the ice age, and the abundance of running waters and wetlands, the nature of Epirus amazes with its biodiversity while, due to its isolation for centuries, it remains largely untouched, and about to become a major magnet for eco travelers. We present the most precious animal and plant species and the most breathtaking landscapes of Epirus, in our own photography, as well

Friday, 20th May

as the opportunities, the perils and the increased environmental educational demands for the local society arising from a potential eco tourist development of the region.

h. 19:00- 20:30, Dodoni Room, Parallel Session S2b

Chair: Costas Gavrilakis, School of Education, Dept. of Primary Education, University of Ioannina

S2b_1. Environment- ELEPAP - Disability

Natasa Mpegka, ELEPAP Ioannina, Greece

ELEPAP-Rehabilitation for The Disabled is a charitable rehabilitation centre which supports the development of children with physical disabilities and developmental difficulties and at the same time provides support to their families. ELEPAP offers a series of holistic intervention programs for infants, pre-school and school- age children. It offers programs for therapeutic, psychosocial, educational, personal and even vocational difficulties for children. ELEPAP cooperates with the local Hospitals as well as with the Public Special Schools operating in its facilities. Furthermore, ELEPAP runs programs for developmental difficulties, early intervention for children belonging to risk groups as well as innovative programs for disabled adults.

ELEPAP's programs combine individual sessions with group activities, and entertainment and game are part of therapeutic practice. Within this frame, emphasis is put on the relationship between disabled people and the environment. According to the United Nations Convention on the Rights of Persons with Disabilities all people must have access to a friendly and safe environment. Planting trees and flowers, taking care of them, co-operating with respect for other people and nature are joint activities which foster integration, awareness and acceptance in society.

S2b_2. Send my Friend to School: Mission Bangladesh – the right to education under the prism of sustainability

Dimitra Deroyannis, Michalis Fotakis, Katerína Giannoula, Dimitrios Ktotos, Theodore Goutas and Kalli Roumeliotou, Action Aid Hellas

Friday, 20th May

In July 2015, six Greek primary and secondary educators along with 2 educators of ActionAid Hellas, visited Bangladesh to examine aspects of the educational system of the country. The educational material which resulted from our experience, is related to education for sustainability and the right to education. However, in this paper we focus on the effects of the dimensions of sustainability (environmental, economic, social and cultural) as far as the right to education for children in Bangladesh is concerned. The teams' purpose was immediacy, interaction, the experiential and interdisciplinary nature of the activities that can be implemented as part of school projects or within the framework of individual subjects both in primary and/or secondary education. The educational material is divided in two parts. The first part is a tale and the second part is the teaching book. There is also a map, included in the material, that connects these two parts. For the promotion of the material, experiential teachers' training seminars were implemented from the educators in Athens, Iraklion, Thessaloniki and Chania.

S2b_3. Ancient Greek Myths and Performing Drama as a Diorama of Sociopolitical Values , as the Enchanting Passage towards a Spectrum of the Primordial Image of Imperishable Life, towards a Higher Level of Social and Environmental Awareness in Education

Katerina Karamitrou, University of Ioannina, School of Education, Department of Early Childhood Education, Greece

Dionysos, the heretical, lamenting bridegroom-νυμφίος of Dramatic Art, the subversive androgynous God of transgression, through His dismemberment and epiphany, shows a class conscience as He aims at the frail reconciliation of aesthetic and cultural forms. Performance is a profoundly Political Act, disclosing those exuberant, exiled creatures of the precipices who poignantly endeavour to capture the primordial image of imperishable Life. Drama, the archetypal Art of nostos is Man's heroic vision, signifying the triumph of intellect against the measures of material-yle against the defeat, the death of Human Body. Theatre is the superlative instructional prerogative, the resultant of all Arts, the embodying Language. The Art of Theatre dramatizes knowledge offering thus, immunity to Human emotion. The pelting development of Theatre Studies and Research in the recent years derives from Human dearth of

Friday, 20th May

Ideas, Experience and Communication. The cultural poverty of homogeneity could only be subverted through the alluring instructions of the God of infringement-parabasis. Ancient Greek Myths and Drama, through the ritual procedures of improvisation, dramatization, theatre-play, interaction, awareness of the cognitive form of the Body, the cultivation of the sensory-motor intelligence, the mythical eventualities of Our Ego, are the vehicle towards a qualitative superiority of knowledge and cultural attitude. Erysichthon's abuse in the sacred grove of Demetra and His retribution, the exotic Nymphs, Dryades, Oreiades, Napaies, Amadriades, Naiades, dwellers of the mountains, the forests, the islands, the trees, the springs, Hekati, the lunar, infernal divinity with the superstitious, bewitching ethos, the Moon-kissed Endymion eternally sleeping on the mountain Latmos, Antigone playing around the lake of Dirke with Eteokles and Polynikes all these ravishing erratic figures, through the magnitude of the person, the entrailing – εντροσθιότητα, the solemnity-τελετουργία, the accomplice distance of the Mask, the sumptuousness, the vigour of the Language, the deafening dimensions of Silence, the transcendental Mythological content, Dramatic Art pieces together and finally, restores therapeutically the fragmenting images, reestablishing thus and embellishing Human Existence with an Environmental and Social awakening. The present introduction aims at the investigation and detection of Myth's and Drama's anthropocentric substance, its therapeutic qualities, its inevitable flourishing, its resourceful dynamics achieved by innovatory actions, approaches and leading to a polymorphic interdisciplinary research in Education and Society, to a developed embodiment of eclectic affinities, to a seminal, harmonized intellectual embrace. After all, Dramatic Art signifies the stormy glorification of Life, the organized adventure of the Body and Intellect and only through its exquisite embraces, its by poetic license challenges, stereotypes are abolished and seditious, prolific ideas of innermost communication are accomplished.

S2b_4. Approaching the environment as sound in Music Education

Theocharis Raptis, University of Ioannina, School of Education, Department of Early Childhood Education, Greece

Friday, 20th May

In music educational theory and practice it is common place today to motivate children to listen to the sounds of their environment. This, however, implies an extension of the term "music" which is not obvious. In this paper I will show how such an extension of the term "music" occurs mainly since the mid-20th century and depends on developments in the fields of Music, Musicology and particularly of Ethnomusicology and Anthropology. At the same time the new theoretical directions in the field of Music Education, related to the general historical and ideological adventures in the 20th century have to be considered. Such an expansive understanding of the term "music" becomes useful for music education in early childhood, because it corresponds to the way children themselves perceive and make music. In shifting the interest to the acoustic landscape the hegemony of visual in our culture is highlighted and related problems which are not discussed to the extent needed (i.e. noise pollution) are fore grounded.

S2b_5. Environmental Ethics, as a Determining Factor for Sustainable Development. The contribution of Early Childhood Education

Maria Sakellariou, University of Ioannina , School of Education, Department of Early Childhood Education, Greece

In this paper is supported that the Environmental Education can establish the new "ethical environment", the Environmental Ethics and dynamically show the model of sustainable development, which is a primary goal for the 21st century. In this direction raises the need for education about the environment and sustainability, through a "sustainable school", ready to face the challenges of the century we are experiencing. Environmental Ethics is not formed only as an even subject of the teaching process, but as an essential need for the survival of our planet and the modern civilization.

Then, are referred the most important models for Environmental Ethics, as recorded in the literature and we observe that their common feature is the incorporation in their approach the key components of Environmental Ethics: knowledge, attitude and behavior, with active involvement of solving environmental problems. So, it's put as requested, the refocus of education in the direction of principles, goals and practices in the context of the vision for a sustainable future of human societies.

Friday, 20th May

An important prerequisite of the above goals is the determination of the pedagogical intervention level. As it is argued by the literature, the most appropriate level for such pedagogic intervention is that of the preschool age, where the facilitators are better. In our presentation we argue, that if children do not form Environmental Ethics during their first years of life, could not develop such attitudes and behaviors later. Therefore an education for Sustainable Development, ought to begin and focus primary on Preschool age and to be critical, values-oriented, holistic, interdisciplinary, multidisciplinary, systemic, educational, innovative, oriented to lifelong activity.

S2b_6. Our own waste the treasure of the earth. Is there any hope?

Natasa Goulgkouti, Eva Aslanidou and Glykeria Ntantou, University of Ioannina, School of Education, Department of Early Childhood Education, Greece

Consumerism is seen to weaken the linkages of people with nature and the need for alternative values as sustainability and respect the environment tend to have more and more importance. Besides family, school education and teachers are important to make awareness and promote environmental friendly practices. This study examines Department of Early Childhood Education students' awareness and attitudes in relation to management of household waste and other everyday practices and incentives for recycling household waste. Furthermore, this study examines students' views about the ways to promote good strategies such as recycling in order to decrease household waste. The data were collected using a questionnaire, which was given to 124 students of the Department of Early Childhood Education of University of Ioannina and data analysis was done with the statistical program SPSS Statistics 2.0. Survey results show that students care about the environment and its protection and most of them make efforts such as segregation of waste into biodegradable and non-biodegradable, recycling electrical appliances, recycling paper, plastic and cans. There is also need for more information about sustainable management of the environment and for more environmental lessons in education from an early age. Concerning recycling incentives, a substantial proportion of students seem to recognize the value of

Friday, 20th May

conserving natural resources and the proper management of the environment.

Saturday, 21th May

Saturday, 21th May

h. 10:00-11:00, Dodoni Room, Keynote (live streaming)

S3. How can we grasp a process as a whole?

Andy Blunden, University of Melbourne, Australia

I tackle the question: “How can we grasp a process as a whole?” as it is answered in the tradition of Romantic Science. I trace the origins of this current of science in Goethe and Hegel, and follow it through Marx and the Soviet Psychologist Lev Vygotsky. Drawing from this perspective I suggest an approach to understanding the problems confronting modern human society in our time.

h. 11:30-13:00, Efterpi Room, Workshop 1

Chair: Katerina Plakitsi, University of Ioannina, Greece

S4a. On the way out of Poverty: Action through participatory methods

Eleni Kolokouri, Athina Kornelaki, Eva Aslanidou, Maria Topoliati, Athanasios Cheilas, Giannoula Pantazi, Eftychia Nanni, Nikos Kolios and Periklis Papadopoulos, @fise group, University of Ioannina, Greece

The @fise researching group designed this workshop on Poverty and Sustainability under the prism of school reality. It was first implemented during the project’s Intensive Study Program where participants from three different countries were involved with great success. The workshop introduces a new method, the forum theater and gives the chance to participants to get involved and express their selves, beliefs and attitudes in a unique way. It poses some very interesting questions on poverty in relation to sustainability and the main topics this workshop deals with are:

- Poverty and immigration
- Social justice and poverty
- Facing poverty in our everyday lives

Saturday, 21th May

h. 11:30-13:00, Dodoni Room, Parallel Session S4b

Chair: Anna Spyrtou, Pedagogical School, Dept. of Primary Education, University of Western Macedonia

S4b_1. Evaluation of the educational animation “The journey of electrical energy” for promoting science and sustainability literacy in primary school students

Anna Spyrtou, Penelopi Papadopoulou, George Malandrakis, Pasxalia Daratzi and Polyxeni Adamantiou, University of Western Macedonia, Department of Primary Education, Florina, Greece

This study concerns the evaluation of an animation film about the production of electrical energy in respect of its use as an educational material promoting sustainability literacy. The design of the film was based on the principles of the STSE educational programs (i.e., Science, Technology, Society, and Environment), so it includes concepts related with the respective domains such as science phenomena and technological objects, effects on society and environmental issues. In order all these aspects to be adequately covered the film is organized in four units; the importance of electricity in everyday life, production process of electrical energy, occupational experts involved and environmental impacts. These aspects are also connected to main sustainability pylons, i.e. environment, society and economy. In the present, questionnaire-based study, we focus on the evaluation made by 177 6th grade students to the particular animation. Students were asked to reflect on what they expect to learn about the production of electrical energy -before watching the animation, and what they finally learned - after they watched it. The particular evaluation was an effort to explore the educational potential of the animation in improving the ways that students realize sustainability issues, and especially those related to the electricity production. Indeed, findings shown that students, before watching the animation, did not refer to social or environmental aspects related with the production of electrical energy. However, in the post test, the percentage of students referring to these aspects was substantially increased.

Saturday, 21th May

S4b_2. Putting theory into praxis: Pre-service teachers actions towards social urban sustainability

Aggeliki Vasiloudi, Antonia Soudi, Georgios Malandrakis and Anna Spirtou, University of Western Macedonia, Department of Primary Education, Florina, Greece

The aim of the present study is to explore the nature and characteristics of pre-service teachers' actions regarding urban sustainability. These actions were organized and implemented by pre-service teachers as part of their attendance to an urban sustainability academic course offered in a Department of Primary Education located in northern Greece (Florina). The course was aiming to the understanding of the social urban sustainability concept and the motivation of pre-service teachers to put into praxis the particular concept by organizing and implementing related actions in the broader area of Florina. Participants were 56 pre-service teachers at the 3rd or 4th year of their study, organized in 14 4-members groups. Data of the present study were collected through the on-line reports of the groups, in which they described their actions and their main characteristics. Following a bottom-up analysis, a category scheme was developed, consisted of five main domains and 21 sub-domains. In particular, the produced main domains and the respective sub-domains are the following: (1) range of action (locally or broadly), (2) target group (residents of Florina, visitors, students, pupils, parents, corporations, scientists, local authorities or residents of other cities), (3) kind of action (direct or indirect), (4) aim of action (research, information, agreement, intervention), (5) sustainability pillars (environment, economy, society). Initial results indicate that the majority of actions have a local range, mostly targeted to residents of Florina, while the majority of them are indirect, aiming to inform or investigate the problem rather than to actually engaged with it. Handing out brochures in Florina and collecting questionnaire data about particular issues from residents are typical examples of such actions.

S4b_3. Exploring pre-service teachers' understanding of urban social sustainability through the analysis of their concept maps

Saturday, 21th May

Stergios Gkitsas, Evaggelia-Zoi Mpara, Vasiliki-Maria Panatsa, Stavroula Tassopoulou and Georgios Malandrakis, University of Western Macedonia, Department of Primary Education, Florina, Greece

The goal of the present study was to explore pre-service teachers' understanding of urban social sustainability. Participants were a convenient sample of 44 pre-service teachers enrolled in the third and fourth year of their study in a Department of Primary Education located in Northern Greece (Florina). Although all participants had attended a course about general principles of sustainability and education for sustainability, none of them had undertaken specific courses about social or urban sustainability. The traditional concept map technique was used to collect data, by asking pre-service teachers to create individual concept maps illustrating their current conceptualization about the social aspects of Florina's urban sustainability. Content analysis of the produced concept maps was performed based on the international literature (top-down approach), while categories from collected concept maps were also developed (bottom-up). Initial results indicated that pre-service teachers had a relatively narrow understanding of the concept of social sustainability, which is depicted in the relatively small mean number of sentences per concept map (~20). Moreover, participants emphasized only some aspects of urban sustainability, such as society (50,1%) and economy (28,3%), while aspects like the environment (9,4%) and governance (11,0%) were neglected. Last but not least, the distribution of the sentences within the categories was disproportionate, as even in the most popular categories (e.g., society) a small number of sub-categories (5 out of 22) held the majority of the sentences.

S4b_4. Using digital stories in education for sustainability: The first results

Varvara Sioukiouroglou, Vasiliki Tzani and Georgios Malandrakis, University of Western Macedonia, Department of Primary Education, Florina, Greece

Digital storytelling is a new, powerful instructional tool for both students and educators, in which images and audio/written messages are combined with music to create short videos that inform people about various issues. This study aims to the development of a framework for analyzing pre-service teachers' (PSTs) digital stories about urban

Saturday, 21th May

sustainability. The research took place in the Department of Primary Education of the University of Western Macedonia, Greece, where 64 PSTs participated and were organized in groups of four or five people (15 groups in total). Each group undertook an issue of its preference, related to the urban sustainability, and among others, they created in common a digital story aiming to exhibit their views on the issue under study. For the analysis of digital stories, a new rubric was developed, comprised of six main domains (Meaning, Audience's interest, Ways of meaning/communication, Soundtrack, Images/Video, Sustainability) and 21 subdomains. Then, two of the authors independently scored the digital stories using a four-point scale ranging from 0 (absence of the characteristic) to 3 (excellent). Results showed that although the majority of digital stories made their point of view clear from the beginning, most of them needed to be more interesting. Moreover, most of the issues illustrated in digital stories are relative to societal aspects of urban sustainability and in a lesser extend to economy and environment. The most usual way of communication was the use of images, while in the most of the cases the soundtrack fitted with the story.

S4b_5. Education for Sustainable Development (ESF) and digital tools: a "good practice"

Michail Kalogiannakis and Stamatios Papadakis, University of Crete, Faculty of Education, Dept. of Preschool Education, Rethymno, Greece

Education for Sustainable Development (ESF) challenges traditional school practices mainly focused on discipline-based and teacher-directed pedagogy. The penetration of the ESF is closely related to its acceptance by the educational community and especially students. In this context, the role of Information and Communication Technologies (ICT) as well as its contribution to the improvement of the learning experience in ESF is particularly important. The new forms of ICT enable school community to overcome the time-space and finance constraints of the traditional learning process. Nowadays, students have the opportunity to make virtual tours using a desktop computer or to conduct experiments that cannot be effectively implemented in the inadequate school environment. The "good practice" which is described in this study is related to the implementation of an ESF program in a provincial High

Saturday, 21th May

school of Crete, an island located at the southern edge of the Aegean Sea. Implementation action plan was based on the combined use of smart mobile devices (smartphones and/or tablets) and Quick Response (QR) Codes. The whole activity was adapted to the six criteria set by UNESCO related to student's awareness, attitudes, skills, active participation and interdisciplinary as well as local and international dimension of the subject. The main purpose of the article is to present an example of how these new forms of ICT can be used to support ESF as well as to trigger a discussion on the transformational effect they possibly have on the implementation of ESF in the school environment.

S4b_6. Evaluation of Innovations. The case of Environmental Education. Teachers attitudes and Practices when implementing environmental projects.

Varvara Zantravali, Ambassador e-twinning, Epirus Region, Head of the 4th Secondary School of Preveza

This pilot research is inquiring the topic: 'Assessment of Environmental Education programs in the Prefecture of Preveza from 2011 to 2013. Teacher's attitudes, aims and practices before and after the implementation'. It starts with analyzing the terms innovation and assessment, literature review follows and then the purpose and the main research question is stated: 'To what extend have the aims and the initial expectations of the teachers been fulfilled after the project implementation?' The mixed methods design was used to analyze data. Results revealed that the attitudes/expectations of teachers come into effect but this is not assessed on quantitative or qualitative criteria due to the lack of an overall assessment plan.

h. 13:00-14:30, Efterpi Room, Workshop 2

Chair: Aggeliki Trikaliti, PhD, School of Sciences, University of Athens, Greece

S5a. Philosophy, Priorities and Skills of Hellenic Sustainable Schools

Hellenic Sustainable Schools Organisation

Saturday, 21th May

Building a sustainable school requires a vision for the overall improvement of the school and a culture of participatory planning for long term educational policies. The building requires a total frame of schools' autonomy and is associated with changes in its organization and pedagogy. All members of the educational community (head, teachers, students, social partners, parents, etc.) need to be equipped with skills for participatory planning, organization and implementation of policies regarding the sustainable school. In this workshop some of these issues will be discussed.

h. 13:00-14:30, Dodoni Room, Workshop 3

Chair: Jarkko Lampiselkä, University of Helsinki, Department of Teacher Education

S5b. Social media to communicate environmental issues

Jarkko Lampiselkä and Noora Kivikko, University of Helsinki, Department of Teacher Education

Do you want to learn how to use social media applications with your work? It is not only about social media, but about communication, self-expression, brainstorming and much more! Sometimes anonymous is important, sometime identification, you name it. With different social media tools, you can activate and inspire people to communicate with each other within the limits of the environmental issue. In this workshop, we will discuss social media as a means of communication and teaching tool both in education and organizations. We will use for example Facebook, Flinga and Kahoot!

h. 13:00-14:30, Foyer, Poster Sessions

Chair: Fanny Seroglou, Faculty of Education, School of Primary Education, Aristotle University of Thessaloniki

S5c_1. Management Authority's Ecosystem Interpretation Park of Lake Pamvotis as good practice of sustainable urban green planning

Saturday, 21th May

Katerina Chioteli and Varvara Noutsou, Management Body of Pamvotis Lake

It is known that increasing urban green can provide significant benefits to humans. Additionally, the proper planning and restoration of urban green spaces can form places that enhance the biodiversity of an area and promote ecosystem functions. In addition, sustainable planning can create urban green islets that are adapted to local characteristics of the area and act as a link with the neighboring habitats which host a significant number of flora and fauna. These spaces are also suitable for environmental education and sensitization activities and offer leisure opportunities to local community. Ecosystem Interpretation Park of Lake Pamvotis is such a case, as the designing of the park was relied on the basic principles of ecological planning in order to keep human intervention /disturbance as low as possible. As a result, the existing relief was retained, as well as the particular spatial characteristics and the existing vegetation that was in a good condition. Natural materials such as wood, gravel, stone and plants of the Greek Flora that attract biodiversity, were used for the landscaping of the park. The park is situated in the Protected Area and close to Lake Pamvotis of Ioannina which belongs to the European network NATURA 2000. It was created by the Management Authority of Lake Pamvotis and is operating since 2010. Although the park occupies a relatively small area of about 4.500 m², acts as a good practice of sustainable development and is used for environmental awareness and sensitization activities, as well as for recreation of the local community.

S5c_2. Cultural and environmental awareness: Case study "Traditional settlements in Thesprotia

Markos Nikolaou, Evangelos Anagnostopoulos and Thalia Theodoridi, Environmental Education Center of Filiates, Thesprotia, Greece

It is considered that there is no static perception but a critical approach of tradition. We are motivated to recognize and reclaim the traditional buildings, traditional villages and settlements, because of their inevitable change. Nevertheless, nowadays they could become an element of economic and professional development for the people who will be

Saturday, 21th May

involved because tradition and cultural heritage is one of the most important elements of the destination branding.

For the last 8 years KPE Filiaton is being responding to the changes occurred within the national- educational policy, demographic changes, requirements of the market economy, local and regional needs and new technologies.

The main theme of our projects:

In the economical field: to register, reclaim and promoting the traditional settlements of Thesprotia and explore innovative methods for their economical exploitation in the framework of a sustainable environmental development.

In the social field: to educate and train people of all ages using new educational materials in terms of environmental awareness, to promote close, well-defined and long-term partnerships among organizations, adult education centers, environmental associations, local authorities and civil society cooperating on projects that promote a circular/collaborative economy.

In the environmental field: to implement actions and volunteer missions towards sustainability such as European programs for environmental protection and rescue of the cultural heritage.

Relevant Activities - Local projects to children 2008-2016: a) "Traditional villages-settlements and Stonebridges" and b) "Hydropower".

During the years 2008-2016, (10) Relevant Seminars and Workshops to adults have been implemented by our Center and we have published (4) books about cultural heritage.

S5c_3. Walking in the forest when the wolf is there.

Ioannis Lampros, Arnaia Environmental Education Center, Chalkidiki, Greece

The Environmental Education Centre of ARNAIAS utilizes an environmental education program titled "Walking in the forest when the wolf is there" . The program is implemented in the context of the existence of the ecosystem of the mountain Holomontas, a mountain in north east Chalkidiki. The importance of the Holomontas ecosystem

Saturday, 21th May

made the Ministry of the Environment to include it in the European program LIFE. The environmental educational program targets on preschool and primary school (A, B grade) students and aims to highlight the importance of the ecosystem.

The educators of the Centre apply suitable and effective educational practices of this age ways of knowing in order to experienced as a friendly place of adventure and excitement. Some of the learning activities are an introductory game to meet and talk with a wolf, a field trip, a treasure hunt game, role play, using their senses to understand nature.

The educational program is the capstone of the programs of the EEC of Arnaia and is implemented in a one-day basis, the 9.00p.m- 13:00. The schools which participate are mainly from Halkidiki.

S5c_4. Environmental Issues in University Curricula. Lessons learnt in the framework of the ÉPOQUE project

University of Naples, Italy

Based on our experience as science education researchers, we entered this project with the belief that the need for modernised environmental curricula in Universities should be based on a change in the epistemological perspective about what science and science education are meant for. This change of perspective should go in the direction of merging the issues of scientific thought with educational, cultural and societal issues in order to construct a brand new and holistic approach to environment and sustainability. In this perspective environmental issues are brought into a wide scenario that involves social, economic and cultural issues and are linked to a general idea of social equity. Building upon these premises we moved along the project schedule trying on one side to collect evidence about the need for change we identified and on the other to contribute to the work of the ÉPOQUE Consortium in building resources that are aimed at supporting this need for change.

S5c_5. Energy Management Systems

Projects in Motion (PiM), Malta

Saturday, 21th May

In view of the world's growing dependence on energy availability, the need for energy management is now felt more than ever. It is essential to save on energy use in order to :

- reduce the damage that we're doing to our planet
- reduce our dependency on fossil fuels that are limited in supply

Energy management is the key to saving energy and Energy management systems (EnMS) are a key to controlling energy consumption and to reach energy efficiency targets. The presentation showcases the efforts done in Course IV of the Epoque portfolio through which the learner will be able to promote and implement EnMS systems within any organisational setup.

S5c_6. Green Entrepreneurship

BEST Institut für berufsbezogene Weiterbildung und Personaltraining GmbH, Austria

The “Blue Minds Factory” is an incubator of the Blue Minds company, which addresses new businesses in the field of energy transformation. The term of energy transformation comprises in particular energy efficiency, smart energy technologies and infrastructure, as well as sustainable mobility. On a larger scale, it is related to city life, modern ways of water use and agriculture. The fields are combined with the opportunities of digital trends. Blue Minds supports business founders as a sparring partner and mentor with comprehensive services on the topics of management know-how, sales & markets, financing & development, infrastructure, and scientific, public and private-sector network.

S5c_7. Environmental awareness – just a first step forward! Comparative study between Greek and Finish middle school students' pro-environmental attitudes and behaviors

Lina Vrakas and Thaleia Arvanitis, M. Ed. Dept. of Early Childhood Education, School of Education, University of Ioannina

Across many EE countries educational systems have incorporated teaching of responsible environmental behavior and sustainability issues into the basic education curriculum. Their goal is to help the new

Saturday, 21th May

generations develop sustainable habits and behavior which stem from informed and purposeful conscience of a citizen. The aim of this comparative across two countries study is to identify whether the promoted culture, environmental information and facilitation of sustainable choices have an influence on the student's, completing the compulsory education, actual understanding and choices. The study was carried out in two countries: Finland, in which sustainability is addressed very strongly and Greece, where education in sustainability is just taking root. In this study public school students (age 15) were given a short questionnaire (n=62) which explored their understanding of socio-economical behavior impact on environment. The results show that deeper understanding of global environmental issues which motivates the need for sustainable choices and lifestyle may require a lot more than just the transfer of environmental knowledge. The initial findings of this project seem to confirm environmental psychology claims that barriers to sustainable behavior need to be identified and addressed accordingly in order to bring about successful implementation of promoted sustainable behavior.

S5c_8. An insight into the qualitative features of the Finnish education system

Vassia Mantziou and Evi Topali, M. Ed. Dept. od Early Childhood Education, School of Education, University of Ioannina

Finland is continually ranked as the best or amongst the best-performing countries in the world in regard to the high quality of educational opportunities provided. The successive outstanding ratings of Finnish students' performances on a series of international comparative assessments have rendered the Finnish education system as one of the most world-renowned. Such an achievement reasonably brings up the question of which are the particular characteristics of the very system that make it so high-performer. The answer lies in a concise account of the National Core Curriculum (NCC)-which defines the basic guidelines for the arrangement of all the schoolwork- and the daily school routine based both on the NCC and the consideration of the special circumstances and needs of the local children and their families. Our work, therefore, aims to provide a brief insight into the fundamentals of the basic education in Finland, as documented during our weekly

Saturday, 21th May

internship in two comprehensive Finnish schools. The qualitative data gathered during our teaching assistant's role comprise recordings, taking pictures, videos and notes and shed light upon the different aspects of the implemented curriculum. Such aspects include the emphasis on the active role of the pupil, the focus on learning rather than testing, the creation of a playing and learning environment through inspiring activities, the collaborative atmosphere and the promotion of students' autonomy and holistic development.

S5c_9. Industrial sustainability: Good practices

George Efthymiou, University of Ioannina

By 2050 the global industrial system is expected to double its output using 50% of current resources and generating 20% of current CO₂. This can only be feasible through a thorough redesign of the industrial system. Research has shown that industrial CO₂ emissions account for over a quarter of the total. The objective of this poster is the result of the participation in the EPOQUE project in Ioannina, Greece (November 2015) along with a traineeship at a textile maintenance company in Lahti, Finland (February 2016) observing energy and resource management as well as pollution sensibility on an industrial scale. Sustainability decisions become an integral part of business decision making, commercialization and customer/supplier relations. Businesses, supply chains and factories that learn how to operate in a world of resource and energy scarcity will hold a competitive advantage that will become ever more powerful. Learning how to use significantly less resources and energy to create the same or better customer value, while creating little or no waste and even reusing waste is not only a long-term strategy but a compelling argument in today's volatile world. This can be achieved having industry, government and academia cooperate in the development of a common definition of industrial sustainability and sustainable manufacturing as well as a common way to assess and reward sustainable industrial practices.

S5c_10. Workshop 4 - Approaching the first links of the Pamvotis lake food chain

Saturday, 21th May

Magdalene Grigoriou and Theodoros Mardiris, Environmental Education Center of Kastoria, Kastoria, Greece

The participants through this workshop will be familiarized with the use of the optical microscope, create preparations with sample of Pamvotis lake water and observe the zooplankton and phytoplankton organisms. By exploiting a short pictorial key, their identification will be attempted and a discussion on their characteristics, forms and role in trophic relationships of lake ecosystem will follow along with the factors, natural and anthropogenic, that can cause changes in their biocommunities composition and population. Particular reference will be made to eutrophication, the causes and its consequences for the lake ecosystem.

S5c_11. Workshop 5 - Environment and Science Experiments

Physics Partizani, Aristotle University of Thessaloniki

Physics Partizani is a group of University Professors and students from the Aristotle University of Thessaloniki who are specialized on conducting demonstration experiments in physics. In this performance they will present some very interesting experiments related to the environment and physics as well.

S5c_12. Actions for the environment and sustainability

Eleni Papanikolaou and Yvonn-Christina Evangelou, Arsakeia Schools in Ioannina

One of the principal aims of environmental education since its appearance, has been the formation of ecological awareness. In that view, Arsakeio Primary School of Ioannina has designed and implemented a series of educational projects starting from the first grade all the way up to the sixth grade, in order to cultivate the students' skills, attitudes and behaviours that are necessary for a sustainable living. The main topics of focus are: biodiversity, water, air, light, sound, electricity and magnetism, energy consumption and energy sources, planet Earth and the Solar System. The projects are following an interdisciplinary approach, using collaborative learning, hands-on activities, ICT, experiments, games, role play, arts and craft activities. As

Saturday, 21th May

a result, the students show a considerable increase of interest in environmental problems, as well as a positive change of behaviour.

h. 15:30-16:00, Dodoni Room, Keynote (live streaming)

S6a. Occurrence of PHARMACEUTICALS of different therapeutic classes in surface waters

Prof. Triantafyllos Albanis, Deputy Rector, University of Ioannina, Greece

Pharmaceutical compounds in the environment lately have been acknowledged to constitute a health risk for humans, terrestrial and aquatic ecosystems. Human and veterinary applications are the main sources of pharmaceuticals in the environment and the major pathways are excretion and discharge to the environment through sewage treatment plants (STP's). In this study, the occurrence of pharmaceutical compounds in the aquatic system of Kalamas River, which receives wastewater from the municipal STP of Ioannina city, was investigated. A monitoring program was carried out for the four seasons of the year 2006. The sampling months were May, July, October and December of 2006. Sixteen water samples from four sampling stations of the River were collected. The compounds investigated include frequently used pharmaceuticals belonging to various therapeutic categories, i.e., the non-steroidal anti-inflammatory, NSAID's drugs salicylic acid, ibuprofen, paracetamol, naproxen and diclofenac, the antihyperlipidemics fenofibrate, bezafibrate and gemfibrozil, the psychomotor stimulant caffeine, the anti-epileptical carbamazepine, the analgesic/antipyretic phenazone and the disinfectant triclosan. The analytical method involves the concentration of water samples using solid-phase extraction sorbents and analyzed by GC-MS.

h. 16:00-16:30, Dodoni Room, Plenary

S6b. EPOQUE students live streaming chat - The Strategic Partnership EPOQUE and the Environmental Policies

Participants: EPOQUE Students, Prof. Triantafyllos Albanis, Regional, National and European authorities

All the work that has been done so far by all the factors of the EPOQUE project, partners, students, associated partners, has been confined

Saturday, 21th May

within the walls of the aforementioned partner institutions. With this session we are organizing a live streaming chat, to host students who took part in the Intensive Study Program of the project and the internship afterwards along with some MEPs and national authorities from the partner countries to participate to this open discussion on the EPOQUE matters. By this means, we are trying to give all participating countries, with a legal representative, a voice in this debate on some of the EPOQUE topics and environmental policies as well. The Greek EPOQUE students, who will attend the conference, will guide this session. The foreign participants and MEPs will join in via live streaming.

h. 17:00-18:30, Efterpi Room, Workshop 6

Chair: Achilles Kameas, Hellenic Open University, Greece

S7a. EPOQUE online platform and course

Achilleas Kameas and Theodoros Panagiotakopoulos, Hellenic Open University, Greece

In the context of the ERASMUS+ program EPOQUE and besides the development of a series of courses (Environmental Portfolio) an online platform was created by the Hellenic Open University which supports the developed courses and sustain the environmental portfolio after the end of the program's funding. During this workshop, the participants will be familiarized with the environment of the platform along with the environmental portfolio's context. In addition, they will interact by taking part into some interesting assignments and finally validate the e-learning platform. Your opinion is worthwhile. Express it!

h. 17:00-18:30, Dodoni Room, Parallel Session S7b

Chair: Marianna Nastou, Pan-Hellenic Teachers Union for the Environmental Education – Dept. of Epirus

S7b_1. To what extent graduates of the Faculties of Sciences are prepared to deal with Education for Sustainable Development?

Aggeliki Trikaliti, School of Sciences, Department of Chemistry, University of Athens, Greece

Saturday, 21th May

Participation of the public on matters that concern policies about the common good is considered extremely important. According to the Rio Declaration on the Environment and Development (1992) as well as the seventeen targets of the United Nation Sustainable Development, education for sustainable development is vital as it provides citizens with knowledge and participatory skills.

Analysis of the questionnaire of the students of the Trans-University Master Course on Chemistry and New Technologies about Sustainable Development revealed that:

- Technology is more likely to provide solutions for sustainable development.
- Scientific sectors play a more important role than civil services on dealing with matters of sustainable development.
- The majority of the post-graduate students do not refer to citizens' action for dealing with litter disposal or the effects of climate change. Furthermore, they do not consider education important for dealing with problems.

Study of the syllabus showed that there is total lack of courses about Sustainable Development.

The following points are significant for future teachers in order to develop positive attitude about Sustainable Development as well as education for Sustainable Development:

- Inclusion in the syllabus of Science Education undergraduate studies, of courses about Sustainable Development as well as education for Sustainable Development.
- Provision of a certificate of pedagogical efficacy to future science teachers.

S7b_2. Educating in Sustainability: A good practice from the Kindergarten

Sofia Saiti¹ and Olga Tsagga², ¹School Counselor of the 45th Educational Region of Preschool Education, University of Ioannina, ²Kindergarten teacher, Headmaster of the 11th Kindergarten of Preveza

Modern education about sustainability aims at training individuals so as to make them capable of approaching environmental issues in an holistic way, cultivating values that respect nature and human beings, exploring the choices made at a personal, social and political level, developing strategies and implementing actions to deal with them. Starting from

Saturday, 21th May

early childhood, when the foundations of the cognitive and social development of children are laid and the communication and collaboration between students, teachers and the local community is being established, it is necessary that children develop 'tools' in order to be able to approach and perceive the world critically, as active citizens.

In the present paper, we will present an environmental education program for kindergarten students that has been implemented, through consistent and continuous sections, in the 11th Kindergarten of Preveza, from 2013 to the present day, under the Eco Schools Network. The aim of this paper is the presentation of the educational activity at the kindergarten level on issues related to learning and teaching citizens the need for a sustainable future, that is part of values pertaining to the environment, art and recycling, as well as to specific cognitive areas of the syllabus. The program modules include a) "shaping" the kindergarten yard by creating a vegetable garden, a herb garden, a rock garden etc., b) waste management and recycling through art and c) the natural construction. Eco Schools Network methodology is followed, applying experiential teaching methods and participatory processes and implementing various activities and actions.

The program aims both at raising awareness, educating and changing students' attitudes towards these particular issues under examination, and at highlighting modern educational practices based on the exchange of knowledge, experience, reflection and constructive dialogue and cooperation among all the members of the pedagogical team, (children, teachers, parents, the community), resulting in multiple benefits for everyone involved at an individual and social level.

S7b_3. Fresh water: The illusion of abundance

Theodoros Mardiris and Magdalene Grigoriou, Environmental Education Center of Kastoria, Kastoria, Greece

This presentation refers to the presence of freshwater, its value and uses worldwide. It discusses the importance of river basins and their contribution to the water cycle, the conventional uses of water (agricultural, industrial and urban uses) and the increasing pressure on global resources. Moreover, the concept of virtual water is introduced and discussion is made about the real water footprint of common goods

Saturday, 21th May

and services. Finally, the fundamental objectives of the international organizations for the sustainable use of freshwater are presented and the role of environmental education emerges as a meaningful option towards a sustainable policy for an efficient use of water in individual and collective level.

S7b_4. Scientific and Environmental literacy in non-formal environmental education activities - In light of Cultural Historical Activity Theory

Liana Stylianou, Environmental Education Centre of Naousa, Greece

Environmental education by empowering students with knowledge, skills, attitudes and motivation and commitment to work both individually and collectively toward solving current problems, aimed at preparing them to achieve Environmental Literacy, a form of scientific literacy, which is the ultimate purpose and is necessary to be considered a responsible citizenship. To enhance true scientific literacy is important to promote abilities as socio-scientific decision-making skills and scientific problem solving, than a thorough basic understanding of fundamental content knowledge. Scientific and individual environmental literacy is essentially a social practice that evolves in time adjusting to the challenges of a rapidly changing world. The Scientific and environmentally literate citizen has reasoning and reflection skills in a social framework based on sound scientific insights.

Several researchers have linked Environmental literacy and therefore scientific literacy with the environmental inquiry-based programs, which promote reflection and link environmental activity with students' motives and interests. Our aim is to describe an environmental education activity in the framework of environmental education through Science. The activity is implemented by non-formal education structure (Environmental Education Centre) and concerns a local riverbed. It is based on the connection of knowledge and social practice, aimed at cooperative learning within groups, the division of labor, the acquisition and use of knowledge taking into consideration the motives and the needs of all students. The unit of analysis is the Cultural Historical Activity Theory because takes into consideration the needs and motivations of all students, and therefore forms a theoretical base for developing scientific – environmental literacy.

Saturday, 21th May

S7b_5. Introduction to environmental issues through a web channel with slow motion movies created by children, teachers and researcher in science education

Anna Leci and Fanny Seroglou, Faculty of Education, School of Primary Education, Aristotle University of Thessaloniki, Greece

In this paper the design, the development and the analysis of a science channel on YouTube named “atlas movies” is presented. This web-channel focuses on providing a place for learning and cooperation between pupils, young people, teachers and researchers in science education. It contains slowmotion movies that is a slow and simplified animation developed by: a) children aged 4-12 years, b) pre- and in-service teachers and c) science education researchers. More than 25 of them, are regarding to environmental issues like the saving of energy, natural resources and bioclimatic planning introducing viewers into the principles of sustainability. Creating a slowmotion movie gives the opportunity to non-experts to give form, shape and sound to environmental concepts in a creative and original way. From 2012 until today, we developed these movies through many applications that took place in: a) pre-school education, b) primary education, c) pre-service teacher education and d) in-service teacher training programs. In order to study the impact of this science channel to viewers we analyze: a) the developed movies, b) the comments and c) the interviews we took from some creators using the GNOSIS research model pointing out the various aspects of the nature of science. In addition, we observe and analyze YouTube analytics because they offer a thorough perspective on the views, on the traffic sources and the demographics. The results of the analysis shows us that atlas movies channel could open new perspectives for creative and interactive learning on environmental issues.

S7b_6. Issues of Environmental Ethics in the Greek Educational System

Marianna Nastou, Environmental Centre of Fillipiada, Preveza, Greece

The absence of legitimate values about the environment and the natural elements that make it up, the prevalence of misconceptions about the relationship between man and nature, the non – attribution of intrinsic

Saturday, 21th May

value and the denial of rights of the entities our planetary ecosystem comprises has led to the swelling of the ecological crisis, which has resulted from political, social and economic choices, and is primarily a moral issue. The redefinition of the way man perceives himself in relation to the other living creatures and the planetary ecosystem demands a change in morals, attitudes, values, actions and behaviors and is a purely educational process which can mainly be achieved through environmental education.

In this paper, various concepts of environmental ethics such as intrinsic value, environmental justice, diversity, intergenerational justice and climate justice are dealt with in an effort to redefine the relationship between man and nature and expand the limits of the moral community. Also, the educational methods applied in the Environmental Education Centers in Greece in order to lead to the formation of environmentally responsible behavior are examined.

h. 18:30-19:30, Dodoni Room, Keynote (live streaming)

S8. Dwelling: Toward a Phenomenological Foundation for Environmental Education along the Lifespan

Wolff – Michael Roth, University of Victoria Canada

In many approaches to education, the environment is but another aspect represented in the mind and therefore constitutes but an external factor that mediates mental constructions. The notion “sense of place” and the Bakhtinian concept “chronotope” have been proposed as alternatives to provide a cultural-historical approach to education that places a primacy on the everyday experiences that learners have with their environment. However, both concepts presuppose the existence of place and space and therefore cannot, from phenomenological perspectives, constitute the ground from which emerge our experiences of the environment or the learning of science. To ground and exemplify an alternative theory of learning that overcomes the problems of conceptual change approaches and their more recent alternatives I draw on a database established in the course of over a decade of research within one community concerning the relationship of science, knowing, and the environment. This alternative derives from the phenomenological insight that we always already find ourselves in a familiar world that we inhabit. The

Saturday, 21th May

image of the subject contemplating a world presupposes the event of dwelling. Dwelling (habiting) immediately grounds this approach to knowing and learning in the environment because sociologically, habiting implies not only *habitus*, habits, inhabitation, and habitat but also labor, the body, and consciousness. That is, dwelling leads us to a practice-theoretical foundation of lifelong environmental education.

Sunday, 22th May

Sunday, 22th May

h. 10:00-11:30, Efterpi Room, Workshop 7

Chair: Prof. Anna Batistatou and Prof. Marika Syrrou, School of Health Sciences, Department of Medicine, Univeristy of Ioannina, Ioannina, Greece

S9a. Microbiome and human health

Anna Batistatou, Marika Syrrou, Panagiotis Kollias, Areti Lagiou, Theodora Ntetsika, Ioannis Parthymos and Chrysoula Sgourou. School of Health Sciences, Department of Medicine, Univeristy of Ioannina, Ioannina, Greece

Microbiome is defined as the sum of microbes found in an environmental habitat. The human microbiome is quite extensive and tissue specific, ie gut microbiome differs from skin microbiome and so on. The gut microbiome has attracted much attention in recent years, because with the advent of methods enabling large scale genetic and protein functional analysis, it has been shown that it influences largely the human body homeostasis. Most importantly, it has been shown that it can influence the development of disease. The main diseases whose initiation is facilitated by gut microbes are obesity and metabolic syndrome, inflammatory bowel disease, liver disease (non viral hepatitis such as fatty liver and autoimmune), and neoplasms, such as colorectal cancer. It is important that, since the gastrointestinal tract is open to the environment, it can be manipulated in regards of gut microbiota synthesis, by various methods, the most simple one being diet (probiotics, prebiotics and polyphenols).

The human gut microbiota contributes to the developmental origin of diseases by modifying metabolic pathways. Epigenetics refers to changes in gene expression that are due to environmental factors and do not affect the nucleotide sequence. The gut microbiota has an important role in human metabolism and could be a significant environmental factor affecting the epigenetic profile. Gut microecological imbalance can produce different epigenetic abnormalities and the onset and progression of disfunctions associated.

Sunday, 22th May

The most important aspect of the discussed issue is the understanding that human microorganisms, that are normally found within our body, are not just innocent bystanders of human functions, but they also participate in and influence human functions. Thus in the future, by manipulating human microbiota we might be able to aid patients' response to specific treatments.

h. 10:00-11:30, Dodoni Room, Parallel Session S9b

Chair: Konstantinos Kotsis, School of Education, Department of Primary Education, University of Ioannina, Ioannina, Greece

S9b_1. Sustainability in Higher Education: A Preliminary Study on Greek Universities

Panagiotis Charizanos and Costas Gavrilakis, School of Education, Dept. of Primary Education, University of Ioannina, Greece

Leaving the UN Decade of Education for Sustainable Development - ESD (2005-2014), the international research community is already studying the response of higher education to Sustainable Development as defined by relevant declarations (Taillores Declaration, HESI etc.). Several approaches, guidelines and tools have been proposed to undertake initiatives and assess the progress of universities that are willing to achieve sustainability goals. The purpose of this study is to examine whether the Greek universities have adopted strategies and initiatives towards sustainability according to these declarations as well as the extent of achievement. For this purpose, we conducted a preliminary investigation on the websites of the Greek universities, aiming to identify existing structures and practices, initiatives and other actions in the context of Sustainability in Higher Education. Main research lines are the dimensions of the Sustainable University, as defined by international declarations: written statements, curricula, research, campus function, students' life, outreach and partnerships etc. This study shows that few Greek Universities have launched systematic initiatives. These initiatives focus on reducing their ecological footprint, through interventions on the structures and functions. Systematic interventions in curricula and development of partnership with local communities in order to promote sustainable practices are hardly detected. Finally, we present the most

Sunday, 22th May

interesting cases of Greek universities that implement sustainability programs and attempt to draw the first conclusions.

S9b_2. Environmental knowledge and attitudes of Greek University student teachers

Konstantinos Gavrilakis, Georgios Stylos and Konstantinos Kotsis, School of Education, Department of Primary Education, University of Ioannina, Ioannina, Greece

Environmental literacy research, including students, teachers and public knowledge, attitudes and behaviors, has a long tradition in Environmental Education and Education for Sustainable Development (EE/ESD). Given that environmental or sustainability concepts and issues are complex and multidimensional, involving physical, social, political and cultural aspects, the investigation of public understanding of and response to these issues is always challenging. Moreover, the scientific and social knowledge of these concepts and issues progresses rapidly and local contexts put different priorities on environmental/sustainability education and policy.

In this context a study was conducted to explore the level of environmental literacy among Greek university students. The effect of several socio-demographic variables, such as gender, educational level and background, on students' literacy is also assessed. This study is based on a questionnaire, including multiple choice questions, which has been used for relevant studies in Australia and Asia-Pacific regions. Several topics have been examined, such as awareness of environmental concepts and problems and priorities at national and global level, attitudes regarding specific environmental and sustainability practices and issues, sources of information etc.

The findings of this study may inspire EE/ESD practitioners from schools, universities and the community to reflect on their practice and plan more effective educational approaches and tools.

S9b_3. Energy literacy assessment of Greek university pre-service teachers

Sunday, 22th May

Georgios Stylos, Konstantinos Gavrilakis, Konstantinos Kotsis and Anastasia Gkoulgouti, School of Education, Department of Primary Education, University of Ioannina, Ioannina, Greece

Nowadays energy production and consumption constitutes one of the most important and popular topics in the world. The consequences of depletion of natural resources and energy-related environmental impacts, affect economy, global and local politics, communities, health of the human and natural world and finally consumers' choices and tendencies.

In this context, an energy-literate person is critical for the long-term conservation, management and use of energy resources. An energy-literate person:

- knows basic energy concepts,
- can locate energy flows and think in terms of energy systems,
- knows how much energy he/she uses,
- knows where energy comes from,
- can assess the validity of information about energy,
- can communicate about energy and energy use in meaningful ways,
- is able to make informed energy and energy use decisions and
- continues to learn about energy.

The present study aims at assessing Greek pre-service teachers' energy literacy - a citizenship understanding of energy through a measurement scale (a multiple choice questionnaire) that includes cognitive, affective and behavioural items.

S9b_4. The acoustic environment in primary schools in ioannina

Pavlos Kassomenos, School of Science, Department of Physics, University of Ioannina, Ioannina, Greece

The work presents the indoor/ outdoor acoustic environment of 15 school complexes, in Ioannina, NW Greece. We examined the controlling factors forming the noise level in these schools. Specifically we measured the noise levels inside the classrooms (both occupied and unoccupied), as well as in the schoolyards and the roadside in front of the schools during the class hours. The average speech noise levels were also measured.

Sunday, 22th May

We found that indoor noise levels breached the internationally recommended levels in all cases, and were further increased during breaks and physical education activities. The background noise detected in the classrooms (coming from the road and the schoolyards) was also found significant. Double glazing seems that diminishes the background noise.

S9b_5. The safe human mobility by foot or vehicle

Dimitris Tsaousis, Former School Counselor, Physicist, PhD

The painting of Austrian artist Franz Matsch (1892) at Corfu's 'Achillion', depicting Achilles dragging the corpse of Hector with his chariot of which the wheel does not appear to spin, was the motive to study how different objects are captured in a photo when they move, rotate or roll. Particular reference is made in the way we walk and in the rotating ballerinas who spin in a peculiar manner known as 'spotting' in the dancing profession. Given that the coefficient of static friction is greater than the sliding coefficient and using photography as a tool to study the way objects are moving, we study the way we move. Simply and without mathematical equations we explain how humans can move safely when walking or transported on wheels. From this analysis, we can understand why slipping is a risk when walking and also give an explanation of the principles behind the ABS (Anti-lock braking system) used nowadays in most cars to help drivers stop faster and safer.

S9b_6. Alternative ideas of environmental science in fairy tales: An analysis of written text

Dimitra Kazantzidou and Konstantinos Kotsis, School of Education, Department of Primary Education, University of Ioannina, Ioannina, Greece

Evidence provided by the existing studies suggests that children's literature, including picture books, nonfiction and fiction texts, can be used as instructional tool to teach science concepts to children. On the other hand, surveys in the content of children's trade books, both fiction and nonfiction, reveal high levels of science errors and inaccuracies. Empirical studies conclude that these inaccuracies contribute to the

Sunday, 22th May

formation of alternative ideas in children. Apart from trade books, children are exposed to different genres of books, such as fairy tales. The purpose of this research is to record errors and inaccuracies of environmental science that are imbedded in fairy tales. About 55 fairy tales written by Perrault, Brothers Grimm and Andersen were identified and examined for the current study. These fairy tales were reviewed for content accuracy and possible alternative ideas communicated in text. Texts were processed via qualitative content analysis method. Categories of errors and inaccuracies were formed. For each category, examples of quotes from the fairy tales are given, together with the scientific consensus view and examples of alternative ideas. It is concluded that fairy tales could communicate alternative ideas about environmental science. Thus readers could develop misunderstandings about environmental issues with regards to sustainable development. The analysis and discussion provide the opportunity for teachers and researchers to identify common characteristics of the errors and inaccuracies which were recorded.

h. 12:00-13:00, Dodoni Room, Round Table

S10. Environmental studies in Europe: The present and the future

The EPOQUE partners talk with the experts, the NGO's, the Environmental Institutions, the regional Ambassadors, the invited Parliament members and the Schools.

Sunday, 22th May

CAMERATA

Orchestra of the University of Ioannina – Cultural Committee
(www.culture.uoi.gr)

Concert Programme

Johann Pachelbel

(1653-1706)

Canon in D

for 3 violins and basso continuo

Franz Schubert

(1797-1828)

Symphony No.5 in B flat major D.485

1st movement, Allegro

Benjamin Britten

(1913-1976)

Simple Symphony Op.4

3rd movement "Sentimental Saraband", poco lento e pesante

Gustav Holst

(1874-1934)

St. Paul's Suite, Op.29 No.2

1st movement "Jig", vivace

Chef d' Orchestre: George Chlitsios

