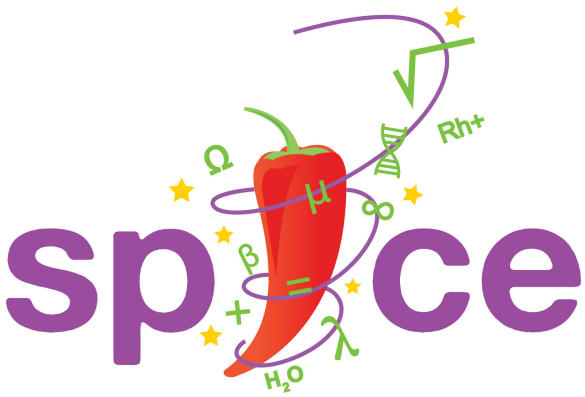
Spicing up Maths and Science classes by sharing initiatives between European teachers

The Spice summer academy



Prague, Czech Republic

Friday 26 to Sunday 28 August 2011

Organized by

With the collaboration of:

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Introduction to the Spice summer school

The SPICE summer school and the SPICE project partners, European Schoolnet (EUN) together with Direcção Geral de Inovação e Desenvolvimento Curricular (DGIDC) from Portugal and Dům zahraničních služeb (DZS) from the Czech Republic, are happy to welcome Maths and Science teachers from across Europe to the beautiful city of Prague, Czech Republic, on the 26-28th August 2011.

The conference is taking place at the National Technical Library – a new library opened in 2009 in the area of the biggest Czech technical university, offering a relaxing and enjoyable venue for – what we hope will be – an enriching week-end.

About Spice

The primary objective of the SPICE project is to collect, analyse, validate and share innovative pedagogical practices, particularly those using inquiry-based learning, whilst enhancing pupils' interest in the sciences. SPICE supports this objective by singling out, analysing and validating good practice pedagogies and practices in maths, science and technology (which nowadays are mostly ICT-based) and disseminating them across Europe.

SPICE involves teachers and experts from 16 different educational systems (from 15 different countries). The teacher panel, along with the science expert panel, has helped the SPICE partners in defining good practices that were tested in class by over 20 teachers during the school year 2010-2011.

About the summer school

Involving the presentations from various EU funded projects (DG Education and Culture, DG Research and Innovation), the sharing of good practices in teaching maths and science subjects, the exchange of hands-on and practical tips during the various workshops, the SPICE summer school will allow each teacher to bring innovative pieces of learning back home.

In particular, results of the testing of the SPICE initiatives in class will be presented, an exciting moment for the 24 teachers that put so many efforts pursuing the aims of the project for almost 2 years now.

On Saturday evening, an exciting guided tour of Prague's historical centre will be offered by DZS, followed by a convivial dinner where you will have the opportunity to meet, discuss, exchange with the other participants.

And during the whole conference, participants will be able to see the poster exhibition in the foyer of the conference hall

About the Communities of Practice

The event corresponds to a crucial step in the activities of the SPICE project, as it will host the launch of the Communities of Practice. These communities will be open to any Maths and Science teachers across Europe interested in testing the SPICE good practices in their class, thus continuing the excellent work started in 15 countries with the SPICE teacher panel.

Programme

Friday, August 26, 2011	
17.30 – 18:30	Conference registration at the hotel reception area
18:30	Bus from conference hotel to the National Technical Museum in Prague
19:00 – 22:00	Welcome evening in the National Technical Museum in Prague http://www.ntm.cz/en situated in a nice green area, near the Prague castle and the city centre.
22:00	Bus back to the conference hotel

Programme

Saturday, August 27, 2011						
8:00 -8:20	Conference registration at the hotel reception area for those arriving in Prague Friday late					
8:30	*Bus to the conference venue from hotel*					
09:00 – 09:30	Welcome and overview of the event					
09:30 – 10:15	Results of the Spice project: 1) The project, 2) Policy; 3) Teachers & GPs					
10:15 – 11:00	Pathway to ISBE					
11:00 – 11:30	International coffee break: taste cookies/pastries from all around Europe brought by participants					
11:30 – 12:00	UniSchooLabS					
12:00 – 12:15	Support for Technology and Science Fields					
12:15 – 12:30	Science Center to Go					
12:30 – 13:00	InGenious					
13:00 – 14:00	Lunch break					
Workshops	Room 1	Room 2	Room 3	Room 4	Open Area 1	Open Area 2
14:00 – 15:30	Spice 1	Spice 3	Pathway (part 1)	Uni-SchooLabS (part 1)	Scientix A: Circlemakers and Augmented reality	Exhibition stands
15:30 – 16:00	Break					
16:00 – 17:30	Spice 2	Spice 4	eTwinning & Spice	Uni-SchooLabS (part 2)	Spice 5	Exhibition stands
17:30 – 18:00	Summary of the day					
18:45 – 20:00	Guided tour to Charles Bridge (Mala Strana area) and the Prague Castle					
20:00 – 23:00	Conference dinner					

Sunday, August 28, 2011						
09:00 – 09:30	Spice: Launch of the Communities of Practice					
09:30 – 10:15	Scientix up to now and next steps					
10:15 – 11:00	Photonics Explorer					
11:00 – 11:30	Break					
11:30 – 12:00	Xperimania (XP) / The Global Water experiment (IYC) / U4energy (U4E)					
12:00 – 12:15	The Pocketbike Project					
12:15 – 13:00	UDiF: The theatre of physics					
13:00 – 14:00	Lunch break					
Workshops	Room 1	Room 2	Room 3	Room 4	Open Area 1	Open Area 2
14:00 – 15:30	Scientix B: Wikis & Tops	IYC / XP / U4E	Pathway (part 2)	Photonics Explorer I	InGenious (part 1)	eTwinning and Comenius networking
15:30 – 16:00	Break // eTwinnig / Comenious networking for all					
16:00 – 17:30	Scientix C: UDiF	Spice 6	Spice 7	Photonics Explorer II	InGenious (part 2)	Exhibition stands
17:30 – 18:00	Overall results and good bye					

Presentations

Spice (À. Gras-Velázquez, P. Chaluš, B. Grečnerová, B. Schwarzenbacher & E. Gérard)

On Saturday, participants will be introduced to the Spice project, its aims and organization, followed up by a review on the national measures taken by different European countries to increase students' interest in pursuing mathematics, science and technology studies and careers. Finally, an overview of the first results from the project will be provided.

On Sunday, the Communities of Practice will be launched and participants will be guided through their aim, how to join and contribute, etc.

The Pathway to IBSE (F. Kouris)

Following the recommendations of the "Science Education Now: A renewed Pedagogy for the Future of Europe" report (Rocard, 2007), the Pathway Supporting Action is bringing together experts in the field of science education research and teachers' communities, scientists and researchers involved in pioneering scientific research, policy makers and curriculum developers to promote the effective widespread use of inquiry and problem based science teaching techniques in primary and secondary schools in Europe and beyond. The aim of the project is to support the adoption of inquiry teaching by demonstrating ways to reduce the constrains presented by teachers and school organisation, to demonstrate and disseminate methods and exemplary cases of both effective introduction of inquiry to science classrooms and professional development programmes, and finally to deliver a set of guidelines for the educational community to further explore and exploit the unique benefits of the proposed approach to science teaching.

UniSchooLabS (A. Chioccariello)

UniSchooLabS aims to promote collaboration between universities and schools by providing remote access to science laboratories for primary and secondary schools through internet-based services. To this end UniSchooLabS provides a tool-kit comprising: a catalogue of available labs, a list of activities for the labs, the possibility for creating a new activity from scratch or adapting existing ones.

Support for Technology and Science Fields (M. Brzezina & K Chmelikova)

The first comprehensive marketing concept implemented by the Ministry of Education, Youth and Sports of the Czech Republic, which is aimed to stimulate reasonable interest of prospective applicants for the study of technology and/or science at universities and other institutions of higher education throughout the country. The project is designed to support universities and other institutions of higher education, primarily in reaction to the growing shortage of university-educated experts in these fields in the all-European context.

Science Centre to Go: Learning in Mixed Realities (H. Buchholz & C. Brosda)

Fraunhofer FIT will present its current work and projects conducted in the field of learning in Mixed Realities.

InGenious (R. van den Berg)

InGenious is a major initiative to establish the European Coordination Body in science, technology, engineering and maths education. The InGenious partnership brings together large European multinationals and Ministries of Education to increase young people's interest in science education & careers. 1000 classrooms throughout Europe will get involved and further partners and stakeholders are welcome to join.

Scientix up to now and next steps (À. Gras-Velázquez & P. Velek)

Scientix, the Community for science and maths education in Europe has been running for 20 months. During this time, it has a) held its major conference in which almost 400 people from 37 countries participated; b) its portal has received over 90,000 visits and almost a thousand people signed up to be members and c) three workshops and more than 30 presentations on Scientix have been organized across Europe. An overview of the community's progress so far and next steps will be provided during the Spice conference.

Photonics Explorer: an intra-curricular kit by teachers for teachers (R. Fischer)

The Photonics Explorer kit makes students from 12 to 18 discover the fascination of working with light. It has been developed to suit the needs of teachers all over Europe, integrate seamlessly into existing curricula, and to engage students with hands-on experiments. How do you design and develop didactic material to reach such an ambitious goal? And what can the Photonics Explorer programme offer to teachers?

Xperimania / The Global Water Experiment / U4Energy (À. Gras-Velázquez)

During the 2011 International Year of Chemistry, both companies and the European Commission have set up initiatives to help teachers complement their science classes with competitions to encourage female students to study chemistry and break with stereotypes, global experiments on salinity and acidity of water and competitions in which schools demonstrate their achievements in saving energy in an effort to move towards a more sustainable future. A quick review of the main target and benefits of these projects will be presented.

The Pocketbicke Project (B. Fonck)

By building a small (~1 m) bike (aka pocket bike) from its constituent parts students learn how physics, electronics, electricity and mechanics, interact to produce an actual running vehicle. The lesson combines the theoretical parts of the course with the technical aspects, without disconnecting science from real life. This project was organized in the first year of the Bachelor degree in electromechanics in Belgium requiring around 24 hours (lessons) divided between theoretical, technical, communication and administrative tasks. Feedback from students was obtained showing positive increase in students' interest and knowledge acquisition. The organizational aspects, the educational approaches using new technologies and the evaluation method can be transferred to other projects.

UDiF - The theatre of Physics: See the sound, hear the light (O. Přibyla)

The performance focuses on creating an alternative and very simple understanding of sound, tones and human hearing. The fundamental tools for the performance are simple light/sound elements: photodiode, loudspeaker and laser pointer.

Workshops

Spice

Learning initiatives can improve the effectiveness of learning scientific concepts, but the way we use them is important. During the Spice workshops, we will analyze the main factors for doing a better didactic use of these initiatives in different contexts and countries. Not only scaffolding is necessary in order to be efficient but also we must follow a good methodology, based on an Inquiry Based Learning process.

Workshop 1: Dudeney's Haberdasher revisited by Ivan DeWinne

The workshop will present background information on the designing process and the use of the Belgian initiative Dudeney's haberdasher puzzle, including the construction of Dudeney's puzzle with GeoGebra.

Workshop 2: Creating triangles with GeoGebra, by Hermann Morgenbesser

The workshop will provide snapshots and background information on the designing process and the use of the Austrian initiative (work in Moodle), a discussion about the positive aspects and problems encountered during the evaluation process; and aspects of using GeoGebra learning sequences in different platforms and languages (short presentation).

Workshop 3: Electric motors by Beata Jarosievitz

The Electric motors initiative will be presented with five hands-on experiments, in which the participants will construct very simple electric motors. Additionally the initiative will be completed by worksheets, video, and interactive crosswords, built in a Moodle course. This initiative combined with project method should raise student's interest in and increase their motivation towards studying Physics.

Workshop 4: Simulations in Physics class (The Archimedes principle) by Daniel Aguirre

In this initiative we use simulations to learn the Archimedes principle, giving the possibility of making experiments beyond the equipment and time a school lab can provide, but without forgetting the connection with real

experimentation.

Workshop 5: Reaction Velocity by Carlos Cunha

This workshop will introduce the Portuguese initiative which aims at teaching students in Chemistry classes about Lavoisier's law, chemical reactions and the analysis of graphs. During a discussion, the positive as well as problematic aspects of the implementation of this initiative will be addressed.

Workshop 6 Comparing Leaves by Tina Michetti

During this workshop the Belgian initiative that can be used in Biology classes will be introduced. The initiative aims at teaching students the skill of identifying and comparing trees, their leaves and environment. This is a hands-on workshop that will highlight the positive aspects but also difficulties that occurred during the implementations and the field trips.

Workshop 7: Diffusion by Zuzana Christozova

This workshop will provide an introduction to the Slovak initiative "Diffusion", which can inspire participants on how to teach this topic in Physics classes in an alternative way. Hands-on experiments, a discussion on the success and problems of the initiative, and the experience of the implementing teachers will make this workshop interesting and fruitful.

Workshop: eTwinning and Spice by Pavla Sabatkova, Eva Trnova and Thomas Roche

Participants will learn how to collaborate and develop MST projects online through eTwinning. Best practice examples of eTwinning projects using videos and hands-on experiments will also be presented.

Workshop: eTwinning/Comenius networking/partner finding by Pavla Sabatkova and Zdenek Hetes

Would you like to start a Comenius or eTwinning project? Are you looking for a project partner? Come to our informal networking session that gives you possibility to change contacts and share projects ideas with colleagues from all Europe.

Pathway

Workshop (parts 1 and 2): Galileo Teacher Training by Rosa Doran & Fotis Kouris

In the framework of the Spice Summer Academy the Galileo Teachers Training Programme is presented as an example of effective introduction of Inquiry Based Methods in science classroom. The Training Programme includes demonstration of ICT based tools for teaching Astronomy, remote control of robotic telescopes, image processing and analysis methods and presentation of a series of best practices used in numerous classrooms across the world. The teachers who will follow the sessions will become part of the Galileo Teachers Network (which includes more than 5000 teachers from numerous countries across the world) and will receive the Galileo Teacher Certificate.

UniSchooLabS

Workshop (parts 1 and 2): Work with remote labs using the UniSchooLabS tool-kit by Augusto. Chioccariello & Andrea Ceregini

The UniSchooLabs activities are "websites" that comprise both the lab learning material prepared by the teacher and the lab notebook to be written by students at each stage of using the remote lab. To familiarize with the UniSchooLabS tool-kit the attendees will have the opportunity to: develop a new lab activity (in the first part of the workshop); use an existing activity playing the role of a student (in the second part).

Scientix

Workshop A: Circlemakers and Augmented Reality

1) Circlemakers by Václav Piskač

People are fascinated by the crop circles for many years. The symbols vary from simple circles to very complicated ornaments. Some say that circles are made by aliens some say it´s a human work.

The workshop will teach you how to make such a large geometry using simple equipment - the rope and your brain.

2) Hands on the "Science Center To Go" by Hagen Buchholz & Constantin Brosda

Experiment in Augmented Reality with a miniature wing, see molecules move, play with the Doppler Effect, have a look behind the curtains of the uphill roller, and play with the double slit.

Workshop B: Wikipedia and Spinning Tops

1) The Wikipedia Start-up Wizard, by Mina Theofilatou

A crash course on Wikipedia editing for the classroom. Participants will learn about the multiple benefits of using Wikipedia as a teaching tool; the wizard will lead them through creating an account and logging in, then editing, previewing and saving their contribution, and performing some basic troubleshooting. Our theme: European cuisine!

2) The spinning top, by Ioan Grosu

The workshop is an opportunity to learn in a very hands-on way how a spinning top works. The presenter of this workshop has created a new and more elaborate version of a spinning top, namely the “driven spinning top” that can be used ideally as didactic tool in Physics classes. Participants will learn about the benefits of its use in the classroom.

Workshop C: UDiF - The theatre of Physics: Teaching, technology and magic by Ondráš Přibyla

(On lasers and other light sources) Arthur C. Clarke once said: "Any sufficiently advanced technology is indistinguishable from magic". This expresses both the great potential and the evil side of technology for science teachers. In our workshop we will play with lasers and other light sources, we will make advanced concepts understandable and get to few general principles that can help science teachers teach about advanced technology and science.

Photonics Explorer

Workshop A: "Say it with light" by Robert Fischer & Amrita Prasad

Let your students (12 to 14 years) experience how engineers work, while at the same time discovering the basic properties of light. This educational module challenges students to develop an optical telecommunication system for an imaginary community in the Andes. Starting with simple light signals, the students get to know the fascinating nature of light, and how it can be employed to transmit information. The students then build their own fibre-optical telecommunication system, just like the international network that makes the internet possible.

Workshop B: "Colours in a new light" by Robert Fischer & Amrita Prasad

This educational module makes students (12 to 14 years) apply the scientific method to research the origin of colours. In a first part of the module, students experiment with rainbows, CDs and colour filters to find out the relationship between sunlight and the colours of the rainbow. In the second part, they research the effects of subtractive and additive colour mixing, using the examples of colour printing and computer screens, respectively.

InGenious

Workshop (parts 1 and 2): 1st Teachers Coordinators workshop by Evita Tasiopoulou, Rinske van den Berg, Arjen Schat and Àgueda Gras-Velázquez

This workshop addresses exclusively the Ingenious Teachers Coordinators. In this very first gathering, these teachers will have the opportunity to obtain a clear idea on the content and goals of the Ingenious project, teachers' coordinators and schools’ tasks as well as all major deadlines and milestones and will be introduced to an example of Ingenious initiative from industry (first part of the workshop). A first draft of the Protocol of experimentation and the various communication channels to be used throughout the project will also be explained in detail (second part of the workshop).

Xperimania / The Global Water Experiment / U4Energy

Workshop: New school year fun science activities by Àgueda Gras-Velázquez

During this workshop, participants will prepare their work to be able to participate in all three projects with their classes, reducing their effort and maximizing their chances of success. For the Global Water Experiment, participants will carry out the Salinity experiment and will put Prague in the 3D Global Map. For Xperimania, examples of entries will be discussed and teachers will be invited to become Xperimania leaders. Finally, participants will be invited to start their best pedagogical actions to raise awareness on efficient energy use in preparation for the 2011 – 2012 competitions. This workshop will ensure Spice science teachers will have a head start in the new school year.

More information

The Spice project is funded with support from the European Commission, under the Education & Training, Comenius Lifelong Learning programme. The project started in December 2009 and will finish in November 2011.

European Schoolnet (EUN) is a network of 30 Ministries of Education in Europe and beyond. EUN was created 15 years ago to bring innovation in teaching and learning to its key stakeholders: Ministries of Education, schools, teachers and researchers. European Schoolnet's activities are divided among three areas of work: Policy, research and innovation, Schools services and Learning resource exchange and interoperability. Through various activities and projects, European Schoolnet provides both Ministries of Education and schools with information services relating to education technology, outreach campaigns on specific educational topics such as maths, science and technology, and research activities in the fields of ICT policy, practice and technical interoperability of learning systems.

More information: http://europeanschoolnet.org

The Centre for International Services (DZS) is directly managed and subsidised by the Czech Ministry of Education, Youth and Sports. Under the guise of the DZS, the National Agency for European Educational Programmes (NAEP) was established and is responsible for the implementation of the Lifelong Learning Programme and other educational programmes in the Czech Republic. NAEP offers promotion of educational programmes, assistance and consultancy services, management of funds and contracts for decentralized actions, monitoring, dissemination and valorisation and organisation of seminars and conferences. The DZS is managing other activities aimed at international cooperation of schools, study possibilities for foreigners in the Czech Republic and collaboration with other European Ministries of Education in the field of ICT in education.

More information: http://www.dzs.cz/

DGIDC is the Directorate-General of Innovation and Curricular Development (Direcção – Geral de Inovação e Desenvolvimento Curricular) of the Portuguese Ministry of Education. DGIDC has a specific mission to conceive, develop, coordinate and evaluate the pedagogical and didactic components of all levels of school education (pre-school, school, special needs, specialized teaching, eLearning) as well as to develop specific programs and measures to reduce school drop-out levels. Within a specific team, DGIDC also deals with the conception, development and evaluation of initiatives concerned with the use of computers, and technological resources in the learning process and promotes the effective use of computers and Internet by all educational agents (students and teachers alike).

More information: http://www.dgidc.min-edu.pt/

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