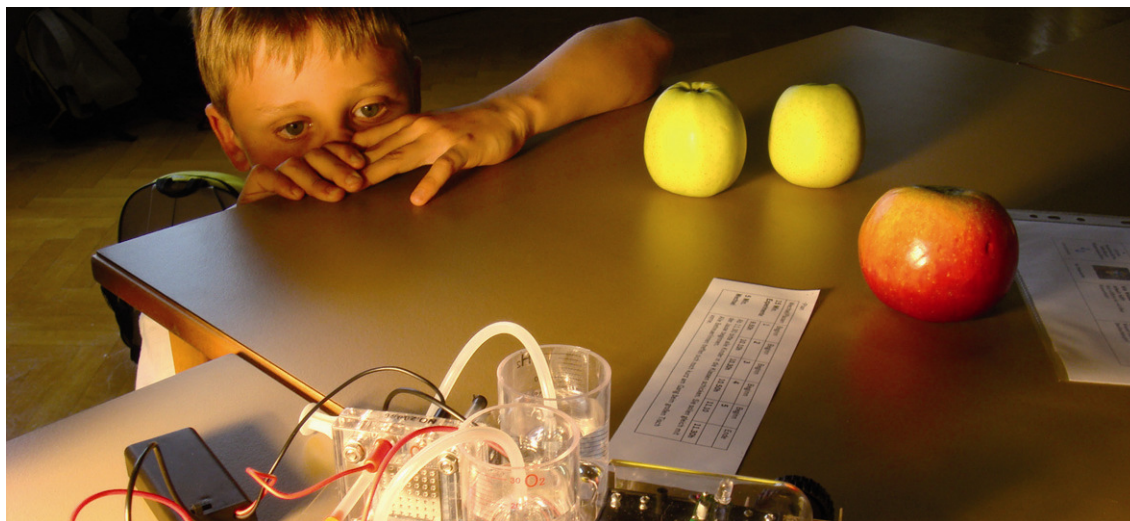


kidsINNscience

Innovation in Science Education – Turning Kids on to Science



The FP7-project **“Innovation in Science Education – Turning Kids on to Science, KidsINNscience”**, a collaborative SICA action, intends to facilitate the innovation of curricula and teaching and learning of science and technology (S&T) in formal and informal settings in order to enhance the interest of young people in S&T.

Science education is constantly being innovated. However, some countries do better than others in international comparisons. Innovations that work in one country cannot simply be transferred to another country. To secure further development it is essential to find strategies for innovating the teaching and learning of S&T in mainstream schools (Rocard, Science Education now: A Renewed Pedagogy for the Future of Europe, 2007). KidsINNscience proposes to analyse and compare strategies for innovating curricula and for teaching and learning in S&T in different partner countries in order to facilitate educationalists at different positions in the educational system (from teachers and school leaders to policy makers and administrators) to operate more creatively within the system and to help generate changes toward more active learning systems. New about the approach of KidsINNscience is that it uses an adaptive strategy. The adaptive strategy enables countries to learn together how to develop feasible innovation plans, carry out effective pilots to collect evidence and formulate innovation plans that fit their own conditions. This will make national innovation strategies more successful and more cost effective. This will also convince key change agents to participate.

The basic assumption of KidsINNscience is that innovations work efficient if they are adapted to the local circumstances. Accordingly, the main questions that KidsINNscience addresses are:

1. What strategies for teaching and learning in S&T motivate teachers and learners in the participating countries?
2. What similarities and differences are there in innovating S&T teaching and learning in the participating countries?
3. What strategies to innovate S&T teaching and learning would work in my country, considering its characteristics of S&T teaching and learning?

Culture and traditions differ from country to country and even within countries. This is reflected in the various educational systems and policies. Thus a comparative approach that distinguishes between generic and specific conditions, between general conditions that apply to all countries and specific conditions that apply to one country or a group of countries or a target group within a country is appropriate. It will enable educationalists from different countries to learn from each other and facilitate the innovation process of S&T education in the participating countries. In each step of the project intensive involvement of teacher/school networks in all participating countries is a pre-requisite for the success of the whole project. The idea is to create communities of researchers, developers of teaching and learning materials and teachers that work closely together.

The **definition of an initial set of indicators** to describe and compare S&T curricula and methodologies for teaching and strategies for learning in S&T in primary and secondary schools in the participating countries with special attention to active and learner centred strategies. This will be the starting point of the project and the basis for a **scan on the S&T curricula and methodologies**. The scan will explicitly focus on innovations and indicate how these innovations relate to S&T education in mainstream schools. The intention of this step is twofold: to get an idea of the state of S&T-education in the participating countries and to test the initial set of indicators. Issues that will be dealt with are, for example, how indicators are interrelated, how they can be grouped into categories and what sort of evidence is useful to indicate performance. The following **comparison of the state of the art** of innovation of S&T teaching and learning in the participating countries will include (categories of) indicators, amongst them gender and cultural differences. On the basis of the scan and the countries' comparison a **common set of indicators** will be defined and innovative approaches from individual countries or regions will be identified. The indicators will be grouped into categories and, where possible, levels of performance will be added. This common set of indicators will enable to make connections between characteristics of S&T-education and to formulate feasible plans for further innovations. They will also be helpful to put national activities into an international perspective.

The innovations, results from the countries' comparison, will be made suitable for national circumstances and concrete actions and materials will be developed (e.g. teaching materials and methodological guidelines for initial and in-service teacher training will be compiled). These **adapted innovative methods** in science education form the basis material of the field trials, a core part of the project. In the **field trials** the adapted innovations are tested in selected schools and/or training courses in each of the participating countries. Each trial is

intended to test concrete learning materials and teaching strategies that are in the zone of proximity of teachers and schools in the various countries on classroom level. This will greatly enhance the feasibility of the piloted innovations. Where applicable the pilots will zoom out to include school conditions and standards. Pilot materials, methodological and pedagogical guidelines and pilot results differentiated to primary and secondary school (respective learner ages) will be made available on the **project web site**. In congruence with earlier steps, special attention will be given to cultural differences and gender aspects. The trials will also be related to initial and in-service teacher training.

Description of field trials:

The field trials will cover 2 full school years. There will be two cycles with the 1st cycle during school year one and the 2nd cycle during school year two. Improved methods derived from the 1st cycle will be tried out within the 2nd cycle. The participating schools might be the same in both cycles or forerunner schools in the 1st cycle and mainstream schools in the 2nd cycle. The specific situation in the participating countries will define which method will be used.

Ethical issues, especially regarding the field trials

The consortium needs to consider a broad range of issues in providing information to study participants and in obtaining consent in the case data (qualitative, quantitative; electronically or manually) will be gathered from individual participants (e.g. pupils, teachers etc.). KidsINNscience will avoid any unnecessary collection and use of personal data. In some special cases, where it might be useful for the evaluation to collect data from children / students, the consortium will have a special focus to do so on an anonymous basis. Data gathering will not involve names of individual participants. The consortium will fully comply with the Directive 95/46/EC on the protection of individuals with regard to the processing of personal data and on the free movement of such data. Communication of the already anonymous data among the consortium members will be realised via a secure project web platform.

All learning activities in this project will follow the rules and regulations (legal requirements) in each participating country regarding the ethical conduct in science and research and regarding safety regulations. Ethics committee approval will be obtained in each country (for European countries the EERA network will be contacted, countries not in the EERA list will contact national ethics committees).

There will be no psychological tests of pupils and all activities planned for the project are comparable to other normal classroom activities. Furthermore all trials will be carried out by regular teachers of the selected school and not by external personnel. Psychological damage of children is not to be expected because all field trials in innovative methods in science education will be within the framework of normal and established school education. Furthermore, all field trials will not mean increased efforts in time and performance for participating children. There will be no involvement of students close to important examinations. The regular national learning content will not change during the field trials, but teaching methods may change.

Regarding the protection of the privacy of children all field trials (also in case of web based learning activities) will take place under the guidance of regular teachers. Only secure web platforms will be used in case of online activities of the children.

The consortium will undertake all efforts to ensure that all potential participants have a very clear and unambiguous understanding of the purpose(s) for collecting their personal data and how it will be used ('transparency'). Furthermore the participants will have to give their consent to the collection of their data ('informed consent', see above). Information sheets for parents/caretakers and research participants will be handed out before the field trials start. If appropriate, these information sheets will be translated into local languages and at a reading level suitable for the age group.

If parents/caretakers cannot read, information about the project will be made available in a locally acceptable format.

Data will only be collected for the named purposes and will not be used for any different purpose and will be kept for five years after the end of the project for scientific publications. Also the participants will be informed that they have the opportunity to opt out of any subsequent uses of their data at any time. Within the steering board of the project responsible persons for data controlling and ethical issues will be identified.

The consortium will not offer financial or material 'rewards' to study participants who take part in their studies, but field trials will be supported financially if necessary in order to be able to carry out field trials that require financial resources (e.g. laboratory rent, materials etc.). Therefore a separate budget has been reserved.

An **evaluation of the field trials** will look at the feasibility and effectiveness of activities in the various countries in Europe as well as in Latin American countries. Cultural diversity and gender aspects will be included in the evaluation. In order to properly evaluate results, the conditions of the pilots in each country need to be described in detail. The descriptions will refer accurately to concrete indicators. This will help to redefine the set of indicators for innovation of learning and teaching of science and it will enable other countries to decide if and to what extent such an innovation will be feasible in their own country. The pilot studies with their evaluation and outcomes are expected to provide concrete data about a range of innovations. Therefore they will provide evidence based results for redefining the initial set of indicators into a common **set of redefined key indicators** for innovating the teaching and learning of S&T. We expect to be able to add levels of performance to a number of vital indicators. This will enable countries to put their own plans into perspective. Taking into account the results of the pilot studies and the redefined common key indicators **concrete, country specific strategies for innovating science education** will be formulated. Reference will be made to the common set of criteria and an intended level of performance will be indicated within the concrete feasible plans for innovating learning and teaching of S&T. The plans will clearly indicate the target group and distinguish between general and specific conditions per country/region. It is important to indicate which key change agents and key change activities at several levels of the educational system are crucial to make the innovation a successful intervention.

Dissemination activities will be carried out all over the project, public relation material as well as scientific articles on interim and final results will support the implementation of innovative strategies and methodologies in teaching and learning of S&T education.

Coordination and Contact:

Austrian Institute of Ecology
Nadia Prauhart
Seidengasse 13, A-1070 Vienna
prauhart@ecology.at
www.ecology.at

Partners:

Freie Universität Berlin, Germany
Universität Zürich, Switzerland
Institut Jozef Stefan, Slovenia
National Institute for Curriculum Development, The Netherlands
Università degli Studi Roma Tre, Italy
London Southbank University, United Kingdom
Universidade de Santiago de Compostela, Spain
Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, Mexico
Universidade Federal do Rio de Janeiro, Brazil

Special Support by

Austrian Federal Ministry of Education, Culture and the Arts, www.bmukk.gv.at
Austrian Ministry of Science and Research, www.bmwf.gv.at
Robert Bosch Stiftung, Germany, www.bosch-stiftung.de

Duration: November 2009 to July 2013

