INTERNATIONAL PROJECTS „ARISE" AND „IQST" FOR IMPROVING QUALITY OF SCIENCE TEACHING

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Introduction

An international cooperation is undoubtedly an important issue. Science is science and it has an international character. Moreover, such cooperation is crucially important for scientists from former Soviet Union countries, because they had no possibility to communicate with colleagues from abroad or such cooperation was strongly limited. It is obvious if we want to obtain the necessary scientific information about different things, to enlarge technological possibilities of societies and so on, generally speaking, to make our world more safe and better, international cooperation among scientists is essential. Only all together we will be able to meet a broad range of global challenges today and tommorow.

Two interesting and useful projects

Recently our team finished so interesting project „ARiSE". All who are interested in modern ICT will be able to find interesting material in more detail on project website at http://www.arise-project.org The main pint is how to apply augmented reality technology in real school practice – for teaching and learning purposes.

M.Adams (2005) sees Augmented Reality technology as one of ten most important emerging technologies for humanity having potentiality to be used in the educational field. Augmented Reality (AR) is the ability to overlay computer graphics onto the real world. Unlike immersive Virtual Reality (VR), AR interfaces allow users to see the real world at the same time as virtual imagery attached to real locations and objects. AR interfaces enhance the real world experience, unlike other computer interfaces that draw users away from the real world and onto the screen (Billinghurst, 2002). In contrast to traditional computer-based education, in an Augmented Reality interface students can be seated around a table and see each other at the same time as a virtual heart floating in their midst. This results in conversational behavior that is more similar to natural face-to-face collaboration than to screen based collaboration (Kiyokawa, 2002).

Four years ago, when starting scheduling the international project *ARiSE*, we did not get across the idea that Augmented Reality Technology could serve as an effective instrument for teaching/learning. The partners from Germany, Romania, the Czech Republic and Great Britain

have implemented innovative and strong ideas. One of the main objectives of the project was to use Augmented Reality Technology to create a new teaching/learning platform for comprehensive school providing possibilities of organizing and implementing the educational process locally and remotely in a qualitatively new environment the evaluation of pedagogical effectiveness and suitability of which had to be carried on. The heart of the Augmented-Reality-Teaching Platform is the interactive AR display system and the software operating it. Starting from an existing AR display, that was created for museums and is available on the market since 2003, the new display system will evolve with a few but important modifications needed to overcome its 'museum legacy' (Müehl, 2005). However, not nearly everything can be properly revised. Much purposeful work has been carried out within this really interesting and promising project. Probably this is not the right time for discussing the mass production of the platform widely applying it in schools. Nevertheless, first steps have already been taken. The created AR teaching/learning platform is original and really encouraging. Mainly new links between computer and consumer as well as the interaction with real objects have been established. The students positively evaluated the created teaching/learning platform. They agree that the use of such technology helps with a better understanding of complex subjects. Besides, technology is attractive and largely independent. The great possibility of visualization is another positive point which is extremely important learning sciences. Furthermore, technology performs completely different conditions for group work and extends them in terms of content and process. Preliminary research supports the idea that the AR teaching/learning platform is particularly suitable for learners with cognitive difficulties such as perceiving abstractions, visual-dimensional thinking etc. The students have mentioned the positive aspects of technology, for example, *'you can learn without stress'*, *'it is faster than an ordinary lesson'*, '*you can see and hear at the same time'*, *'helps with a better understanding'* etc. (Lamanauskas, Pribeanu, Vilkonis, Balog, Iordache, Klangauskas, 2007). Thus, we can reasonably maintain that Augmented Reality Technology promises breakthroughs in education and cognitive potential.

Another our project was connected with preparation of science teachers. The main question is how to improve science teacher training, how to increase their scientific literacy. Our consortium worked intensivelly on implementing all project „IQST" (Improving Quality of Science Teacher Training in European Cooperation) activities.

This international project (http://www.IQST.upol.cz) tried to implement newer pedagogical theories into initial science teacher training. It is important in the context that the constructivist perspective is becoming a dominant paradigm in the field of the natural science education.

Partners of the project prepared training materials for initial science teachers training:

- Development Procedural Skills in Science Education – Constructivist Approach (Bulgaria);
- Assessing Science for Understanding – Constructivist Approach (Czechia);
- Floating and Sinking of an Object in a Liquid – Based on Socio-cognitive Constructivism (Cyprus);
- European Dimension in Integrated Science Education (Lithuania);
- Using the Laboratory to Enhance Student Learning and Scientific Inquiry (Turkey).

Training materials of five countries were prepared based on Constructivism theory. On the basis of the preliminary observations we can state that all training materials are useful in the university teaching process. We hope that all training materials prepared during the project implementation will assist students, lecturers and administrators in their work. All training materials are good support for prospective science teachers training programmes. Another important thing is that all training materials can be used in many different ways by students and lecturers. Some customers will be able to point their users directly to our project website, others will be able to integrate the material with their own website or learning environment. Finally, we hope,

that all users of these training materials will be able to match the different learning styles of prospective science students to really help them succeed (Nezvalova, Lamanauskas, Raikova, Valanides, Pekel, 2009).

Summing-up

It is obvious that all projects are different. For example, large-scale scientific projects are very different to standard scale projects, which can be characterised mainly in four aspects: budget, human resources, time scale, productivity. The projects usually comprises experts from different areas of science and education. Another argument is that the globalization is becoming an international trend making countries open their doors, integrate and participate further in international co-operation activities. Generally speaking, we should recognize the importance of projects to education success. Projects generally are doing something new, innovative and this is very important.

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