



1st CROATIAN WORKSHOP ON
CHEMICAL EDUCATION
11. - 14. November 2010.
Split, Croatia

Toward Higher Quality of Chemistry Teacher In-service Training in Croatia

(short description of scope, goals and outcomes)

1st *Croatian Workshop on Chemical Education* is the initiation event of the project *Toward Higher Quality of Chemistry Teacher In-service Training in Croatia* which is planned as a continuing series of workshops on chemical education that will be held in Croatia. The project is planned as a series of biennial phases.

November 2010 objective (1CWCE)

The primary objective of the project is to organize the first workshop (*1st Croatian Workshop on Chemical Education*, 1CWCE), *i.e.* to accomplish the phase one of the project. Phase one should impel further development of the process of in-service training of chemistry teachers in Croatia and the Region and should facilitate the dissemination process of in-service experiences between neighboring countries.

The 1CWCE event will take place at hotel Atrium in the ancient town of Split at the Croatian Adriatic Coast from November 10th to 14th 2010.

Expected outcomes

The short-term and long-term goals of the project may be best described by the following:

- a) to provide international support for the on-going modernization of chemistry teaching/learning strategies at the primary and secondary education level in Croatia,
- b) to promote incorporation of inquiry learning, namely the small-group discovery-based learning strategy, into the new *Croatian Chemistry Curriculum* and, thus, enhance the opportunities for students to learn chemistry in a meaningful way,
- c) to promote the needed awareness of action research, *i.e.* research into the teaching/learning process in one's own classroom that should be seen as a continuing activity after the event that comprises on-going professional development.
- d) to give the necessary support to the institutionalization process of the graduate study *PhD in Science Education* at the Faculty of Science of the University of Split,
- e) to create a dynamic and challenging atmosphere that will impel career development of young chemistry teachers,
- f) to stimulate social networking among chemistry teachers in Croatia, as well as in the geopolitical region, and to correspondingly enable further dissemination of fine teaching practices, classroom activities and teaching experiences,
- g) to assist National Chemical Societies in the Region to coordinate the exchange of information and to reduce the differences in chemistry-teaching practices caused by different social and political environments,
- h) to enlarge the number of experts on inquiry learning strategy being capable to training other teachers.

The Project got the support of the IUPAC's *Flying Chemist Program* and should impel further enhancement of the already existing collaboration between the neighboring countries' National Chemical Societies and will also enable the organizers to introduce the participants with the best experts in the field. According to the IUPAC's Strategic Plan 2002-2003,¹ the project conforms to the strategic goals **d)**, **e)** and **f)**.

We believe that the project will certainly accomplish a noticeable regional impact considering the fact that it should attract attendees from neighboring countries in the Region, *i.e.* Slovenia, Bosnia and Herzegovina, Serbia, Macedonia, Hungary, Austria, Italia etc. This should be ensured by enhanced collaborations among national chemical associations and governmental in-service training agencies of the neighboring countries. That regional impact of the project is a reasonable expectation is easily justified by the fact that educational systems of mentioned countries (especially those emerging from former Yugoslavia) share mutual history and are now facing common problems in developing new directions for chemical education and education in general.



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Croatia is a *country-in-transition* facing various social and political changes and, correspondingly, facing the reform of its educational system. The Government of Croatia stated its view about national education policy in the document *Education Sector Development Plan 2005 – 2010*² wherein it was clearly emphasized that priorities in educational development include:

Improving the Quality and Efficiency of Education and Supporting the Continuing Professional Development of Teachers and Other Education Personnel.

Changes have been started on all education levels of which *Croatian National Education Standard (CNES)*² has been elaborated as a foundation for changes in program and teaching/learning methods at the primary education level. The *CNES* has been experimentally implemented and assessed during 2005/2006. The curriculum for the chemistry program has also been revised and chemistry content updated. It is very important to stress that *CNES* was designed to bring about change into the everyday teaching process. This was especially needed in the science courses where the transformation from a classical lecture approach with very few demonstrations and experiments prevailed.

The *CNES* provides a new teaching/learning strategy called Small-Group Discovery-Based Learning Strategy (SGDBLS).³ The origins of this teaching strategy trace back to the ideas of Ariel Guerro.⁴ For nearly 30 years, several Croatian chemistry teachers have practiced and developed his ideas. Its core is comparable to the principles of the Vygotskian and Ausubel approaches.^{5,6}

Assessing the effects of *Experimental CNES Chemistry Program* the government-independent institution *Institute of Social Sciences Ivo Pilar* has identified that *CNES* has a positive impact on both teachers' and students' satisfaction with chemistry education. This assessment also noted that *CNES* has led to greater efficiency in the development of students' cognitive levels. However, concerns has been expressed about the delivery of the new teaching methods, particularly on their direct implementation into the everyday chemistry class(room).

To facilitate accepting of the aimed changes, over 20 workshops were held for primary school chemistry teachers (July, 2005 – October, 2009).

Because the process of upgrading the chemistry education in Croatia needs to be further continued, and the learner-centered approaches should be further implemented into the chemistry classes at the secondary level, *Croatian Chemical Society, Faculty of Science of the University of Split* and *Education and Teacher Training Agency* agreed to establish a relevant project together with foreign experts in the field of chemical education. As Croatia is a developing *country-in-transition*, and as the current global economic crisis seriously affects its financial situation, the IUPAC came out as the best and most logical international partner for its *Flying Chemist Program* and an international source of experts in the field of chemical education.

References

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- 5) Vygotsky, L. S. *Thought and language*, The MIT Press, Cambridge, USA, 1985.
- 6) Ausubel, D. P. *The psychology of meaningful verbal learning*, Grune and Stratton, New York, USA, 1963.
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