

## **Chemistry is All Around Network**

### **Workshop on "Teacher Training"**

### **Bratislava, Slovakia, 16.05.2013**

## **Minutes**

### Participants

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### Importance of training teachers

Slovakia is going through another reform in education, state educative program, curriculum standard and power standard are going to be changed for individual subjects at basic and also at high schools. Problem of number of students in one class is being solved. According to teachers current state is unacceptable (huge number of students in class, too general curriculum, wrong – poor textbooks ...) and it is going to be worse. Amount of lessons of chemistry was lowered at basic and grammar schools, divided lessons, which were focused mainly on practice – laboratory work, were cancelled. It is practically impossible to do laboratory work with 30 students in a class. At the basis of law regulations for work with chemical factors at basic and high schools (law n.67/2010 and it other regulations) is experimental work – demonstrations of the teacher, students laboratory work almost not done. Chemical laboratories were closed down at many schools, some of them even do not have class for teaching chemistry and the teaching is done in normal classes in which didactic technology is mostly absent. We can not say that this state is at every school but

well equipped schools for teaching scientific subjects are rare.

In the case that didactic technology is present at school – digital Technologies as computers, interactive board, visualizer, voting machines, measuring machines for experimental work – teacher rarely know how to use them in educative process in the effective way. Interactive board is many times used as expensive screen at which PowerPoint presentations and videos are projected. Teachers do not know how to control the program and do not know how to create educative materials with them. The same it is in the case of measuring machines which are great source for experimental work of students but are too expensive for schools.

Teachers at Slovakia are being educated for many years (the first national project Project Infovek has been started in 1999), in all subjects, in using technologies (mainly technical aspect of them) up to using of new teaching methods etc. Education of teachers is directly based on law of pedagogical employees and teachers get credits for being educated, which help them to get better salary condition (getting of 1. and 2. qualification exam). Unfortunately a teacher at Slovakia has to be educated mostly in his spare time. That is the reason why we mostly see aversion from teachers towards being educated than need, pleasure, enjoy.. We have to mention that there is lack of young teachers at schools, there are mostly female teachers with 20 years practice and many retired teachers.

Society nowadays requires active, innovative, creative teacher, who needs to be educated if he wants to fit into this requirements. Teachers nowadays can be educated by many projects (financed by the EU) which are provided by educative institutions, Methodological centers and various organizations which offer educative accredited courses. In our opinion the offer of educative courses and trainings is good. The question is whether the courses and trainings are of appropriate quality and whether the teacher learns here everything he needs for his pedagogical practice.

### Recommendations, guidelines for teachers

At Scientific faculty of UK in Bratislava is for the second semester running project Incubator

of inovative teachers of scientific subjects at basic and high schools, by which students preparing for a job of a teacher have an to become familiar with various approaches and methods in teaching by prepared lectures and workshops with inovating teachers. Students have an opportunity to try presented approaches and methods in lectures (e.g. creation of evaluative tables, creation of plan and proposal of activities according to daltonic system, formulation of aims of the teaching according to Bloom's taxonomy, realisation of experiments with the help of measuring machines, etc.).

The needed guideline for teachers is MŠVVaŠ SR, ŠIOV and ŠPÚ Safety during the work with chemical factors at basic and high schools. The publication is methodological material to some legal and technical aspects of realisation of school chemical experiments - what are the operating rules, what is the classification of chemicals, some practical recommendations for work in chemical laboratory, which chemicals a student can use during the experiment and which only the teacher can use. In this publication information about chemistry competition and some motivating experiments can be found.

Study materials, which were published within the project Modernisation of educative process at basic and grammar schools (MVP ZŠ and MVP SŠ) created a great response among teachers (not only chemistry teachers). Together 16 publications were published – for subjects at the first level of basic school, art and music classes, slovak language, history, physics, biology, mathematics and chemistry. The publications offer big amount of illustrative models of teaching lessons with using digital Technologies, various approaches and teaching methods. The teachers of chemistry are very satisfied with the study material. They would be grateful for another series, more illustrations and teaching materials or opportunity to download created materials which are presented in publication for other teachers (who are not involved in the project MVP).

Using of simulations is common for teachers of physics and mathematics (Java applets). For chemistry teachers there are some webpages at which they can download free simulations of chemical actions, e.g. <http://phet.colorado.edu/> (the page is available also in czech language, not all simulations are translated into czech) or <http://group.chem.iastate.edu/Greenbowe/sections/projectfolder/simDownload/index4.html>. I



use simulations from mentioned webpages, mainly in the topic of pH, electrolysis and galvanic cell. A worksheet with tasks is also needed for students to find out what they have to do with simulations.