

## **Practical Chemistry Sessions by Means of an Inquiry Based Approach: a Case Study in the Physical Chemistry Lab.**

Sven Capenberghs, Hans Vanhoe, Katrien Strubbe

*Ghent University, Department of Inorganic and Physical Chemistry, Krijgslaan 281 (S3), B-9000 Ghent, Belgium  
E-mail: Katrien.Strubbe@UGent.be*

Practical sessions in a chemistry course are meant as independent learning situations in which students acquire and/or practice specific manual techniques, skills or work methods by performing experiments that support the theoretical concepts. Practical sessions where pupils have to follow “recipes” to obtain experimental results that are next being analysed and discussed fit in this view perfectly. Very often a chemistry practical session is hence reduced to an activity where a student strictly follows the teacher’s instructions and handles the data according to the procedure described in a text or handbook to obtain a conclusion.

Although this approach is perfect for the development of lab skills such as observing, measuring accurately and precisely, structuring data, etc... it doesn’t contribute to the integration of the chemical concepts by the student. Another disadvantage is that students, as they have little or no contribution to the organization of the activity, may find the experiments not challenging enough. As furthermore the experiments that students have to perform are usually not related to situations that are linked with the pupil’s environment, this may lead to a decrease of the motivation towards the practical sessions and – more general- towards chemistry.

In the Physical Chemistry Course for 3<sup>rd</sup> years bachelors in Chemistry at Ghent University, we recently explored a new method for the practical sessions, following a context-rich inquiry based approach. Within this approach, we confronted the students with problems from real-life situations, such as considering the solubility of plaster in different aqueous solutions, the chemical form of ammonia in commercially available solutions, etc.. Students had to look for information, analyze the problem, propose a research method and perform the investigation. They were allowed to use different methods, provided that the necessary equipment was available. Although the students were free to choose the experimental set-up for each experiment, they used the same methods as were used in this practical course before. From interviews it appeared that their involvement for the course was higher than that of students who performed physical chemistry experiments in a non-inquiry based way.