

## Enhancing the Performance and Attitude Towards Practical Chemistry Sessions by Means of ICT

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Various programs for 1<sup>st</sup> bachelor students in sciences, bio-engineering, pharmacy, medicine, etc contain chemistry as one of the fundamental courses of the study program. Usually this chemistry course is a combination of lectures, seminars and practical sessions. The practical sessions 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. In the past it was observed that a large part of our first bachelor students at Ghent University considered these practical courses of minor importance and not very stimulating, and that a lot of them came to these sessions unprepared, hardly realizing what was expected.

A possible explanation for this rather negative attitude was that the main part of the course evaluation was based on knowledge and application of the theoretical concepts during an end-of semester-examination and that the students had the impression that their performance during the practical sessions was therefore less important. To deal with this attitude, we introduced the electronic online- examination environment “Curios” of Ghent University as a tool for (self-) evaluation. Before coming to the lab, students have to use this electronic platform to solve 10 multiple-choice questions regarding the experiment and the underlying concepts. The evaluation is included in the final marks for the course. The result was a noticeable increase in the involvement of the students towards the experiments and –as a consequence- a better performance in the lab.

To deal with the prevailing view that the practical sessions were not motivating, the offered experiments were critically evaluated. A major part of them was replaced by new experiments in which ICT was implemented and parameters such as temperature, pH, absorbance, etc.. are measured in real time by means of sensors and a Coach<sup>®</sup> interface. With this type of experiments, the data can immediately imported into a spreadsheet program and analyzed. Preliminary results show that with the introduction of the new experiments, the perception of students towards the practical sessions has evolved towards a more positive attitude.

The foregoing results clearly show that the introduction of ICT in practical sessions may have a substantial effect on both the performance of students during practical chemistry sessions as on their attitude.

