

## LABORATORY NOTEBOOKS – WHAT ARE YOU ASSESSING?

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The production of laboratory reports is generally considered a necessary component of the undergraduate studies of chemistry students. These reports are a record of the activities carried out and are generally assessed to determine students' understanding of the chemical techniques and concepts covered during the laboratory activity. The assessment of laboratory reports tends to be itemized with a strict marking breakdown for each section, e.g. title, aims, results, etc. From the students' perspective, the repeated writing of laboratory reports can be excessively time consuming and may not lead to the development of recording skills which are useful in research or industrial laboratories. Students often tend to focus too much on unnecessary procedural detail and not enough on the meaning of their results. While students may gain experience in technical writing, the learning of chemistry concepts may not be enhanced by the preparation of formal laboratory reports (*Wimpfheimer, 2004*).

For this reason, the maintenance of laboratory notebooks was introduced into a chemistry laboratory module for a pre-service teacher program. The assessment of this module was based on class tests and the laboratory notebook which the students kept throughout the module. Students were given general guidelines for the recording of each laboratory activity and what was expected of the content of their notebooks. Their notebooks were to include all the information necessary to repeat the experiments, address the chemical concepts covered using molecular level drawings where possible, and also suggest ideas of how the particular experiment/activity could be used in their future teaching. Students were not given a marking scheme of how their notebooks were to be graded.

The assessment of laboratory notebooks is a challenging task. What are the essential attributes that students should demonstrate in their laboratory notebook, how can these be graded and how does this form of assessment compare with written tests? An assessment rubric for the module was developed based on the notebook guidelines provided. The variation of notebook grades to their in-laboratory class tests are discussed in terms of the perceived learning that has occurred.