Use of Learning Outcomes to Design a Practical Microbiology Module

Module Outline
- 10 credit practical module taken as part of 60 Microbiology credits in third year
- Students work in groups of 5 to 6 students
- 5 different areas of practical Microbiology covered in the module

Aims of Module
1. To equip students with the ability to competently complete techniques routinely used in Microbiology laboratories
2. To provide students with situations where data generated from the techniques can be understood and analysed correctly

Generic Learning Outcomes
A student who successfully completes this module is expected to be able to:
- Define and identify the steps required of individual and group experiments
- Judge the potential of each group member’s proposal
- Defend the plan for experiment completion
- Organise the reagents, cultures, media etc., that are required for the experiment
- Test the plan on the assignment (see specific aims and objectives for guidance here)
- Keep a good scientific record of data
- Evaluate and make conclusions about the data received individually and in group discussion
- Present the completed experiment in a written and oral report

Assessment
- Formative: tutorials; completion of experiments; specific technique training sessions; reviewing laboratory notebook; written reports
- Summative: practical techniques exam; laboratory notebook; written & oral reports

Teaching Methods
Sequencing of Experiments
Experiments will be sequenced so that the practical skills that the students learn in the initial experiments can be re-enforced in subsequent experiments
- Lectures
  Formal lectures will provide specific theory for individual experiments
- Self directed study / group study
  A library of microbiology manuals will be given to the students
- Tutorials
  Structured tutorial/discussion sessions will be conducted at different times in the module
- Mentoring
  A postgraduate mentor will be assigned to group
- Guide to Scientific Writing
  Students will be given guidance on writing scientific papers so that they can have a format to write their reports on the experiments

Conclusions
- Using the learning outcomes model helped focus on the practical skills the student needed to be successful
- Assessment of the module is clarified by the learning outcomes. If a student can demonstrate achievement of each outcome he/she has passed the module
- Defined learning outcomes convey to students that the responsibility for learning is on themselves.