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Editorial Quality of Science education (II)

Calidad de educación en ciencias (II)

Since we have been speaking about the quality of science education (Orlik 2000) it is important that systems for the evaluation of courses and the assessment of students should be discussed. There is wide concern internationally that the traditional systems of assessment which tend to dominate our courses are, to a greater or lesser extent, inadequate and inappropriate to assess fully the understanding and abilities of students (Chemistry in the National Science education Standards ,1997)

An effective system of evaluating progress of learning and developing competence is necessary and important for students, teachers, parents and also to contribute to judgements which must be made about course quality. At all levels, throughout school and university the system must be not only objective and systematic but, in itself, the process should contribute to the learning process. Concern about current systems of assessment include their tendency to over-emphasise knowledge and the application of formulae which can be learned by rote – and taught by repetitive, and often low-level, boring exercises.

A modern curriculum which lays emphasis developing the full potential of individuals must also include the evaluation of high order cognitive skills such as creative, critical, analytical as well as the ability to ask questions and evaluate information gained from a variety of sources – from experiments, books, electronic media and the Internet. Do educators world wide or national education systems agree that this IS a major objective of education in school? Teachers and the education system need to employ a wide variety of creative approaches to gain useful information during the course. This should inform the students and teachers about progress and help to ensure that difficulties for the students and the course can be overcome. Students will be helped to set individual targets and teachers will improve lesson planning. (Jenkins 2000) This is 'formative' assessment and evaluation. However, these diagnostic and summative methods of assessing students` progress in Science must also be manageable for the teachers. An impressive list of these competences is given in "Teaching: High Status, High Standards, (1998) which is published by the UK Government.

Another, and equally important, aspect of student assessment is that it should encourage the students to actively continue their science learning. (Science Teaching Reconsidered, (1997). An effective modern system of examination in science should include the different kinds of examinations : testing with multiple choice answers, written and oral examinations, assessment of laboratory work. No one method of assessment is adequate for testing a course. A wide variety of test methods is required for a fair measure of our students` attainments (Johnstone, Ambusaidi, 2000),

Current educational practice in schools and universities show us that courses centred around the science laboratory and investigations have much to commend them. Carefully organised experimental work is

often the best way to enable students to link theoretical ideas with the necessary practical skills and first hand experience with materials and equipment. However, such learning is NOT automatically achieved – students can do practical work by rote – without understanding. The most successful laboratory programs encourage students to learn with deeper understanding.

There is a wide variety of other experiences which can be included alongside or instead of the traditional 'cook book' practical work. These active learning approaches can involve students more actively and lead to higher achievement. Some examples of these are:

modular laboratory programme, when all laboratories are closely associated with theory and assessment system, organisation of discussion before and after laboratory work (Coppola et al 1997), investigations at initial level for high school and first semester university students (Lamba et all 1997, Sviridov et al 1997), original tasks, interesting demonstrations, amusing and puzzling events, competitions, debates, visitors and visits and many more. The editors would be very interested if you would send examples of innovative and interesting assessment methods which work for you and your students.

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