

Which assessment type should be encouraged in professional degree courses - continuous, project-based or final examination-based?

Karol Miller

Department of Mechanical and Materials Engineering

[The University of Western Australia](#)

Assessment strategy is a very important component of every university unit description. Assessment strategy guides students through the course. From the information how students are to be assessed conclusions are drawn about what in the course is important and what is not. Similarly the important units are perceived as those, which are difficult to pass, and vice versa.

The rigorous examination ascertains that students who pass it accumulated certain competences. This statement is unfortunately valid only on the day of the examination. Most of students loose this competencies next morning. However, they proved that when need arises they are able to reacquire the required proficiency.

Assessment based on assignment and project work seems to be preferred by students. Those who do the assignments themselves learn much more than when learning for the exam. But what about those who are substantially helped by others in their assignment work or do not really contribute to team projects?

Introduction

My experiences are based on the practice in the Department of Mechanical and Materials Engineering of The University of Western Australia, especially from teaching Computer Application and Machine Dynamics to second year, and Engineering Statistics to third year students. Continues assessment, based on assignments and project work (including team work) has become very popular. The practice is encouraged by The University of Western Australia policy. However, we have to stop for a second and think, whether the rigorous final examination should not remain a core element of the academic assessment in accredited courses leading to professional degrees (eg. engineering, medicine, etc.).

Assessment strategies

In the tertiary education context two concepts are often confused: assessment and evaluation. Assessment is concerned mainly with gathering information to help make decisions on issues related to students being assessed. Evaluation is usually oriented towards using the assessment information for apprising the worth of instructional programmes, educational outcomes, teaching processes or curricula. Assessment is a strategic problem-solving process that uses measurement as one of the means of systematically collecting and analysing information for making decisions in all aspects of instruction. Assessment should include both quantitative descriptions (measurement, eg. test scores) and qualitative descriptions (non-measurement, eg. anecdotal records of behaviour) of performance. The process of assessment usually requires a higher level of analysis than merely measuring task performance. Evaluation is the process of determining to what extent the educational objectives are actually being realised (Tyler, 1950, Scriven, 1967, Gronlund & Linn, 1990). Assessment and evaluation of students' performance affect all other aspects of instruction.

Lecturers should constantly collect information about student performance. These data allow teachers to determine students' levels of achievement, evaluate the effectiveness of instruction, identify topics that require additional teaching and plan new instruction. Such assessment and evaluation of students' progress is an important aspect of the lecturer's role (Cole and Chan, 1994).

Assessment method should not be confused with specific assessment tools, such as testing, examinations or other means of measurement. Measurement refers to any quantitative description of performance regardless of the instrument employed for the measuring. Testing is a systematic procedure for observing behaviour and describing it with the aid of numerical scales or fixed categories (Cronbach, 1990). Tests are usually of relatively short duration and serve a wide range of purposes, such as classifying students, determining students' levels of performance in specific subjects and diagnosing learning problems. Examinations are usually held at the end of semester or academic year. They are normally more formally organised and require more time. The purpose is ascertaining (or certifying) students' levels of competence.

Assessments can be classified in a variety of ways. Some of perhaps more useful ones are listed below (Cole and Chan, 1994):

Assessments can be classified as formal or informal. Formal assessments are typically used for certification or grading purposes. Informal assessments are typically conducted by lecturers and tutors during students' normal activities.

Formative assessment is assessment conducted during a course to apprise students' learning progress, to identify instructional objectives which have not been obtained, and to ascertain whether students have adequate prior knowledge to cope with subsequent stages of a particular learning sequence. Summative assessment is typically conducted at the end of a course or unit. It is used mainly to determine levels of final achievement in a particular subject area as well as for certification purposes. Diagnostic assessment aims at locating strengths and weaknesses in students' performance.

Norm-referenced assessment concerns the use of tests and techniques that allow the interpretation of students' performance levels in terms of their relative position in the group. Due to increasing number of students and diminishing standards in education, it is very important not to use norm-referenced assessment in professional degree courses. Criterion-referenced assessment evaluates students' performance in terms of a specified domain of knowledge or competencies, or relative to an absolute prespecified standard of achievement (ie. UWA strategic plan: international benchmarking).

In continuous assessment, students' performance is assessed over a number of occasions and in a variety of situations through the course, thus providing a more representative view of student capabilities than is available from assessment on one single occasion at the end of the course. In final assessment, students' achievements are measured once at the end of the term.

Product assessment concentrates on the appraisal of learning outcomes achieved by students, including certification whether the course requirements and standards have been met. Process assessment involves collecting information on learning processes. This usual cannot be directly observed but must be inferred.

Assessment plan

Carefully developed assessment plan should include the following components (Cole and Chan, 1994):

Pre-instructional assessment

How should students be grouped for more effective learning?

To what extent students possess the prerequisite skills needed for effective learning, or is review required?

Are there any students who have already achieved the intended outcomes of instruction and hence will find the instruction redundant?

Formative assessment

To monitor progress and to diagnose learning difficulties and help to increase students' motivation.

Summative assessment

This allows the lecturer to certify that students have attained required levels of proficiency as well as to apprise the effectiveness of the instructional programme. Formative and summative assessments are

extensively used eg. in Warsaw University of Technology. In most of core units student must successfully pass a formative assessment part, comprising short tests during tutorials, laboratory and project work in order to be admitted to the final examination venue.

The above principles are applied in the development of curriculum-based assessment. The procedures for developing curriculum-based measurement programmes are described eg. in (Fuchs, 1987). This technique combines systematic monitoring of student progress with effective designing of instruction.

It allows for (Cole & Chan, 1987):

- Matching of the assessment of student achievement with the curricular being taught
- Direct measurement of student performance
- Evaluation of student progress on specific objectives as well as more general goals
- Frequent assessment of student performance
- Provision of valid inferences about instructional modification
- Reliability of measurement
- Sensitivity to small but important changes in student performance

It is important to establish efficient routines for assessment. Assessment should be perceived as an integral part of the teaching and learning process. This can be achieved by eg. involving students in the assessment process (eg. marking).

Dilemma

It is every lecturer's duty to make use of assessment information to plan instruction. Assessment results should be used as the basis for planning instruction. The dilemma whether to use final examination-based assessment or continuous assessment really results from the lack of sufficient resources. Academics should be using both. However, lecturers face a number of practical constraints, such as availability of time and support personnel. This severely limits choices to be made. It is essential that such factors be considered in planning assessment procedures, see eg. (Scott and Stone, 1997) describing work on web based tutorial systems.

The rigorous examination ascertains that students who pass it accumulated certain competences. This statement is unfortunately valid only on the day of the examination. Most of students loose this competencies next morning. However, they proved that when need arises they are able to reacquire the required proficiency.

Assessment based on assignment and project work seems to be preferred by students, Those who do the assignments themselves learn much more than when learning for the exam. But what about those who are substantially helped by others in their assignment work or do not really contribute to team projects? They still pass and obtain a professional degree from the Leading University!

References

Cole, P. G. & Chan, L. K. S. (1994). *Teaching Principles and Practice*. Prentice Hall of Australia, Sydney.

Cronbach, L. J. (1990). *Essentials of psychology testing*, New York, Harper Collins.

Fuchs, L. S. (1987). Program development in curriculum-based measurement. *Teaching Exceptional Children*, Fall issue, 42-44.

Gronlund, N. E. & Linn, R. L. (1990). *Measurement and Evaluation in Teaching*, New York, Macmillan.

Scott, N. W. & Stone, B. J. (1997). A flexible Web-based tutorial system for engineering, maths and science subjects. *1st Asia-Pacific Forum on Engineering & Technology Education*, Monash University, Melbourne, Australia, pp 141-146.

Scriven, M. (1967). The methodology of evaluation. In R. E. Stake (ed.), *AERA monograph series on curriculum evaluation*, No. 1, Chicago. Rand McNally.

Tyler, R. W. (1950). Portfolio assessment: Sampling student work. *Educational Leadership*, 46(7), 35-39.

Please cite as: Miller, K. (1999). Which assessment type should be encouraged in professional degree courses - continuous, project-based or final examination-based? In K. Martin, N. Stanley and N. Davison (Eds), *Teaching in the Disciplines/ Learning in Context*, 278-281. Proceedings of the 8th Annual Teaching Learning Forum, The University of Western Australia, February 1999. Perth: UWA. <http://lsn.curtin.edu.au/tlf/tlf1999/miller.html>

[[TL Forum 1999 Proceedings Contents](#)] [[TL Forums Index](#)]

HTML: Roger Atkinson, Teaching and Learning Centre, Murdoch University [rjatkison@bigpond.com]

This URL: <http://lsn.curtin.edu.au/tlf/tlf1999/miller.html>

Last revision: 26 Feb 2002. © The University of Western Australia

Previous URL 18 Jan 1999 to 26 Feb 2002 <http://cleo.murdoch.edu.au/asu/pubs/tlf/tlf99/km/miller.html>