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Assessment: Central to Learning

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ABSTRACT

Staffroom walls often hear "I have to set another x tests by the end of the week. It all seems such a waste of time; I know who will pass anyway." Yes most of us find setting assessments a chore and a bit of a drag. Yet they are central to academic study. It is assessment that positions the goalpost and the height of the hoop. It is assessment that controls who can continue to the next level. It is assessment that governs who receives those valued pieces of paper called certificates, diplomas and degrees. This paper will examine the theoretical and practical role of assessment in our courses and consider some of the imponderables.

- Does it matter what we assess?
- If assessment is important, is more, better?
- Are case studies and assignments better/fairer than exams?
- Which is better competence, mastery, or grades?

1. INTRODUCTION

Assessment in an educational setting is some judgement about a student's learning or knowledge (Knight 1995). There are three major reasons to assess: to improve learning, for institutional management and for accountability (Renwick and Renwick 1992; Angelo 1994). The first, student learning, is close to teachers' hearts. The second, institutional management, is the use of assessment for such things as streaming and prerequisites. In our environment the major purpose for this is to ensure that students are in courses that they can reasonably be expected to pass. Accountability of education is an international reality. It is imposed on us, and therefore in the 'must do' category. We are accountable to a variety of stakeholders: government, employers, professional bodies, taxpayers, students and their parents. It is perhaps for this reason that teachers and students often resent assessment rather than see it as a part of learning. There is an alternative view that an integrated approach to assessment can be at the heart of student learning (Knight 1995; Popham 1995).

The tertiary classroom of the new millennium is more diverse than ever before. There is a wide range of engagement, abilities and cultures. It cannot be assumed that the student will engage in the learning process regardless of the delivery and assessment method. "Good teaching is getting most students to use the higher cognitive levels that the more academic students use spontaneously" (Biggs 1998). The teaching focus must be clearly on what the student does and there must be a clear alignment between objectives, teaching and assessment (Biggs). In an environment where attendance at class and completion of exercises and homework is optional the most powerful tool that a teacher has to encourage student participation is that part, which in the student's view, really counts – assessment (Popham 1995).

2. WHAT ARE WE TRYING TO ACHIEVE

In all educational settings we are trying to achieve a multitude of things at one time. The students need to obtain knowledge and skills. Generally we should not be satisfied that they know how or why, but both (Evans 1991). We want them to reach a level of understanding where they can effectively communicate with people who are knowledgeable in the domain (Nickerson 1985).

However there is often too much emphasis put on knowing 'why' without knowing 'how'. In many domains it is often important that basic skills can be applied automatically so that more sophisticated problems can be addressed without overloading short-term memory (Evans 1991). A good example of this is program language syntax. If the learner is trying to remember the syntax for a copy statement simultaneously with the algorithm for a binary search they will suffer from memory overload.

Along with skills and knowledge we are generally trying to develop students' intellectual thinking. Studies (Belenky, Clinchy et al.1986; Perry 1970) have mapped the intellectual development of people through a series of stages: silence, received knowledge, subjective knowledge and procedural knowledge. Silence is normal only during very early childhood. Received knowledge is typical of childhood and the early teens, when the explanations of authority figures are ready accepted without question. This is followed by subjective knowledge when internal voices and a search for self replaces external knowledge; the teenage years, when typically people endeavour to explain the world in their own terms often without regard to the opinions of others. Belenky's *et al.* final position is procedural knowledge at which point people are consciously, deliberately and systematically analysing new ideas and integrating them into their own knowledge base.

It can be assumed that the majority of our school leavers are operating at the subjective knowledge level. One of our goals is to develop them intellectually so that they are operating at a procedural knowledge level.

3. HOW CAN ASSESSMENT HELP ACHIEVE THESE GOALS?

Assessment is the single most powerful tool we have as educators in the tertiary environment (Popham 1995). It is the only part of the teaching and learning process where there is complete accountability on the part of the student. As teachers we need to make best use of this tool to achieve the learning goals of our programmes.

Regardless of the purpose of assessment it must be seen as a fair and valid measure of the skills and abilities it is intended to measure (Herman 1992). What we assess is the most influential factor on what skills and knowledge the student will learn.

4. TYPES OF ASSESSMENTS

The continuum of possible assessment tasks is huge; clearly each will affect the learning experience in a different way (Hager and Butler 1996). At one end of the continuum are three hour finals as the only assessment, at the other workplace assessment and informal evaluation by student or teacher that does not result in an official grade. In between there are other typical task such as essays, assignments, case studies, projects, tests, attendance and portfolios. I will focus on summative assessment as formative assessment is becoming increasingly less effective as it is ignored by many students (Biggs 1998).

4.1 Tests and Examinations

Tests and examinations are the most familiar form of assessment. They are generally conducted under controlled conditions and the student has a number of set questions to answer (Woolfolk 1993). There are a number of advantages of this form of assessment. The examiner can be more certain that the work is that of the individual. A test can be a motivator to encourage students to learn basic material. Tests also concentrate the time spent on assessment, leaving the majority of course time available for learning.

However tests are effectively a snapshot of a selection of a student's knowledge. They are, of their very nature, a sampling procedure. Controlled assessments present a paradox when one evaluates their fairness and validity. Many would claim that they are more fair and valid than uncontrolled assessment as one can be sure that the work is that of the individual and all participants have equal time and resources. However it is also claimed they often have little affinity with real tasks that they purport to assess (Gardener 1992).

4.2 Assignments & Case Studies

A typical assignment requires students to solve a problem that has been defined by the teacher.

Assignments allow the students to undertake larger pieces of work over a longer time period (Woolfolk 1993). Carefully designed assignments can cover the skill requirements of the course and engage students in the higher-level cognitive activities such as reflective thinking. It is also possible to challenge students to consider significant problems and then construct a thoughtful model of the problem and a problem solution; this gives the student practise at reasoned problem solving.

Academic essays encouraged students to research and present the thoughts of knowledgeable others but not to voice their own opinions. The student has to put aside his or her own views that are normally uppermost during the subjective knowledge stage and consider the principles being expounded by the experts. It is likely that this exercise will contribute to the student's knowledge and intellectual development (Belenky, Clinchy *et al*. 1986; Perry 1970).

However assignments have some negatives. It is difficult to verify authorship. If a class is all working on the same problem, generally one or two of the more able members of the class will solve the difficult aspects of the problem and share the solution with the group as a whole. Often the tasks set as assignments have little relationship to 'real' problems.

Case studies are in many ways similar to assignments. Generally case studies resemble a 'real' problem (Linn and Clancy 1992), although the problem had often been 'sanitised' by the teacher and therefore lacks the complexity and messiness of the real world (Plimmer 1999).

Whenever the teacher specifies the problem it is difficult to engage the student in one of the most demanding aspects of problem solving, problem definition. A problem specification will of its very nature direct the solution space (Gonzalez and Dankel 1993). This means that the student will not fully engage in one of the components of problem solving.

Clearly assignments and case studies are more likely to allow the student to complete work in an environment that is close to the normal work environment. However some students do not submit their own work. The origin of work is often difficult to prove and validity and fairness become a real issue if there is no controlled assessment.

4.3 Authentic Assessment

Recently there has been a shift to authentic assessment, assessment tasks that mirror the real world and are integrated with learning. Assessment where the learners are active participants and the criteria are open and negotiable (McDowell 1999; Aitken 1993). The goal is to engage learners in the assessment as well as the learning. This engagement should assist the learner to develop better learning and self-evaluation skills that are essential as we move to a society where life-long learning must be the norm. Portfolio assessment is perhaps the most common form of authentic assessment.

In the broadest terms portfolio assessment is a purposeful collection of a person's work. With portfolio assessment the teacher need not specify what the student should do, but rather what skills he or she should demonstrate. This means that the teacher does not set the problem. Portfolio assessment has traditionally been used in creative fields such as fine art and music. More recently it has become common in a much wider range of educational settings (Gardener 1992).

A well-designed portfolio will meet the teaching goals of engaging the students in higher order cognitive activities (Arter and Spandel 1992; Gardener 1992; Biggs 1998). When the teacher leaves problem specification to the student, the student is able to engage in the complete problem solving cycle from problem specification to implementation and review. Effective use of portfolios in a course requires careful planning and implementation; the requirements and method of evaluation must be specifically defined.

Portfolio assessment has some limitations. As with assignments and case studies the teacher cannot be sure that the work submitted is the student's own. This is potentially more of a problem than with predefined tasks as the student can simply submit work copied from a book or the Internet and it could be difficult to prove that it is not the student's original work. The other major difficulty with portfolio assessment is the assigning of grades.

5. A COMPARISON OF TYPES OF ASSESSMENT

To review the major types of assessment: Tests and examinations provide a snapshot of student ability, are good tools for encouraging learning of basic skills and recall knowledge, and can be relied on to be the work of the individual. Assignments and case studies can be used to encourage students to engage in larger pieces of work, apply discipline to their research and writing, and integrate assessment into the learning process. However they do not require the whole problem solving process. Portfolios have all the advantages of assignments and case studies with the added advantage of encouraging students to define their own problems and review their work. All uncontrolled assessments suffer from the problem of verifying authorship.

The choice of assessment tools clearly should be dependent on the goals of the course. A number of variables must be taken into consideration: the learning outcomes, the length of the course, the philosophy of the programme, the portion of contact to non-contact learning time. If the goal is simply to be able to recall knowledge then simple tests are appropriate. However if demonstration of high order skills is required then assignments, case studies and portfolios are more appropriate. Portfolios lend themselves to courses of longer duration, as they are generally a collection of work.

The type of assessment is likely to affect the intellectual development of the student. We can require them to present only the views of experts or reflect on their work and select the best for presentation or assessment. We can set large tasks that need planning and time management to complete. These types of task are believed to encourage intellectual development.

One could conclude that if assessment is the key to better learning then more assessment will mean more learning. It may indeed result in more learning of skills, but is likely to result in less intellectual development as the self management and self assessment that is integral to intellectual maturity will be negated.

6. GRADING SYSTEMS

There are three major grading systems used in New Zealand Polytechnics. Graded passes with a 50% pass mark and A, B, C grades. Mastery with an 80% pass and in some cases a 95% merit pass. Competence with an 100% pass mark. Both mastery and competence generally include resits and resubmissions. Criterion based assessment is pervasive to all of these.

I have experience of all of these systems. My experience is that the higher the pass mark, the less that is taught and I believe the less the students learn. When we set an assessment we do so consciously or subconsciously with the expectation that most of the students in the class will be able to pass. This is regardless of the course criteria, which are generally open to interpretation. When we lift the pass mark we lower the goal posts. When we mark assessments we make a professional judgement as to whether the work is satisfactory. If it is the student gets a passing grade regardless of whether this is 50%, 80% or 100%.

What we can do with a lower passing grade is encourage the more able students to learn and think independently. With the Bachelor of Information Systems degree at Manukau we returned to a 50% pass mark and graded passes. Doing only what is required will not get you an A+ in our system. Our best students have been motivated and rewarded for independent work, in simple terms they have learnt more.

There are situations where competence assessment is appropriate. Knowledge of the road rules, identification of the live wires in a circuit.

7. WHICH IS BEST FOR LEARNING?

There is no best assessment method! An assessment plan that matches the learning outcomes of the course is what is important. If it is important for students to master basic skills early in the course such as programming language syntax or a methodology, a test on these skills at the beginning stages of the course is likely to have the desired effect. If it is important that the students undertake a large piece of work, then assignments, and case studies are appropriate. If students would benefit from doing a range of smaller tasks then a portfolio approach may be best.

8. WHICH IS THE BEST MEASUREMENT OF STUDENT ACHIEVEMENT?

Any of the above methods will provide an accurate measurement of student skills and knowledge so long as you can verify authorship. A very large study in the United States that compared two ends of the spectrum – standardised tests and portfolio concluded that the method of assessment did not alter the grade of the individual students (Supovitz and Brennan 1997). Students scored very similar scores with both tools. Intellectual development is much more difficult to measure, but studies by Entwistle, Tait *et al.* (1994) do show that different programmes do result in different levels of development.

9. SUMMARY

The primary goals of assessment are to aid learning, for educational management and evaluate students. Any assessment method could prove a fair measure of students' knowledge and skills. The more open the assessment method, the more opportunity for students to engage in the higher-order cognitive skills that are likely to result in intellectual development. Clearly the objective for the teacher is to plan an assessment strategy that will reinforce the learning process.

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