The Development of Competency-based Assessment Strategies for the Professions
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National Office of Overseas Skills Recognition
Research Paper No. 8
June 1993

Australian Government Publishing Service
Canberra
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CHAPTER 1

INTRODUCTION

1.1 Aims of the Guide

The work in developing national competency standards in the professions has progressed over the past year, with nineteen projects currently underway with funding assistance from the National Office of Overseas Skills Recognition (NOOSR). Only four of these, however, have begun to develop competency-based assessment strategies.

NOOSR Research Paper No. 7, *Guide To Development of Competency Standards for Professions*, (Heywood, Gonczi and Hager, 1992) was designed to assist the professions with the development of competency standards. This guide is designed to help the professions in the design of strategies to assess these competency standards. It concentrates on the assessment of performance but not to the exclusion of other forms of assessment. As we point out in Chapters 3 and 6, assessment of overall professional competence will involve a range of assessment strategies, including the assessment of knowledge, the aim of which should be to assess competence in line with the *integrated* model of competence outlined in NOOSR Research Papers No.1, (Gonczi, Hager and Oliver, 1990) No. 2, (Masters and McCurry, 1990) and No. 7, (Heywood et al, 1992).

Despite there being an enormous amount of literature in the assessment field, only a small proportion of it concentrates on assessment of performance and less still on the performance of professional work. Thus, most of the strategies suggested by the literature have to be reinterpreted to fit the context of the professions. Nevertheless, this guide is not intended to be a theoretical text aimed at filling this gap. Rather, it is a practical document which will supplement but not replace the many technical works on assessment procedures.

**Under a competency-based assessment system, assessors make judgements, based on evidence, about whether an individual meets criteria specified in the profession’s competency standards.**

Competency-based assessment does not only rely on the technical and objective process used in standardised testing. It will rarely involve the activities which are associated with traditional norm-referenced assessment, particularly...
This paper discusses all the components of a competency-based assessment process—the gathering of evidence, the question of professional judgement, and the question of the criteria against which the judgement will be made. It aims to canvas key issues and provide some practical advice on what to assess, ways of gathering evidence, ways of judging the evidence, and how to manage the process.

1.2 The Current Situation of Competency Assessment in the Professions

Currently there are a number of professions in Australia developing competency-based assessment strategies. The dietetics profession is developing a combination of assessment methods. The nursing profession has been working on validating competencies and training assessors for over a year. Within some branches of the medical profession the notion of competency-based assessment is very well developed and has been operating in many countries for over a decade. But competency-based assessment is also being undertaken in other faculties in a number of universities. In almost all teacher education faculties for example, there is an attempt to assess teaching competence during supervised teaching practice. Some accounting courses have developed co-operative arrangements with industry where students are assessed on their organisational skills, communication competencies and attitudes, in addition to their technical competence (see Appendix B).

1.3 Examples in this Paper

The examples used in this paper come from professional education courses offered in universities and from registration and examination boards in Australia and New Zealand. However, because the development of competency assessment in the professions is not very advanced in this country, occasionally examples from the professions in the United States are used, as are some hypothetical examples.

A number of examples come from particular branches of the medical profession. The reason for this is that the best assessment practices in this profession appear to be more fully developed than in any other occupation. This is undoubtedly due to the serious consequences of certifying incompetent practitioners and the international effort over recent years to refine assessment
practices in order to minimise this risk. Sophisticated performance-based assessment is widespread in medicine despite the fact that the profession in Australia has not developed a set of national competency standards. In the case of the assessment of most specialists, agreed standards underpin the assessment system but these are implicit and have not been validated in any national competency project.

Obviously the medical examples are apposite for professions where clinical competence is essential. We believe, however, that many of the examples are also relevant for quite different professions. For example, the use of role play in assessing interviewing skills in medicine may be suitable, when adapted, for the legal profession or accountancy.

It is recognised, nevertheless, that the nature of the work within professions is very different and that different assessment methods will be needed.

1.4 Future Developments in Competency Assessment

It is clear that there is a significant amount of research that needs to be undertaken in the area of competency-based assessment in the professions. For example, there is little or no literature on how to reliably and validly assess ‘learning how to learn’, yet this is increasingly being identified as an essential competency in the work of many professions. Similarly, there is little literature on the assessment of attitudes, yet values and attitudes are consistently identified by the professions as vital to competent professional work.

As the professions come to develop competency approaches to assessment, they will undoubtedly wish to experiment with methods which will lead, before too long, to more valid, reliable, and efficient methods than are currently foreseen.

1.5 How to Use This Paper

This paper is intended to be read in sequence initially. Chapter 2 defines competency-based assessment and outlines its potential uses. Chapter 3 examines some of the commonly held misconceptions about competency-based assessment. It makes the point that many of the concerns expressed about competency-based assessment are capable of being solved quite easily.

The aim of these chapters is both to reassure the professions and to challenge them. Reassurance should come from the recognition that assessment of performance is already common amongst the professions. The challenge, it is hoped, will come from the recognition that by using a competency-based
approach assessment can be improved—made more valid, reliable, fair, efficient, undertaken in ways that are more acceptable to candidates, and which will promote learning more effectively.

Chapters 4 to 8 examine how to determine *what is to be assessed*, the variety of ways of gathering evidence, i.e. *assessment methods*, considerations that need to be taken into account in the *selection of methods* and ways of *judging performance* on the selected methods.

Chapter 9 ranges over a variety of issues. These include the questions associated with the training of assessors, ways of facilitating *recognition of prior learning and credit* for studies undertaken, and bread and butter management strategies such as the *writing of manuals* to assist assessors and candidates, *recording and feedback* strategies.

Chapter 10 summarises the main themes of the paper.

The major steps in designing a competency-based assessment strategy are summarised in point form.

Finally, there are six appendices which are case studies of assessment strategies in the professions: medicine, accountancy, nursing, veterinary science, architecture and dietetics.

For those professions which have already implemented parts of a competency-based assessment scheme, individual chapters can be used either as a starting point for the consideration of specific issues or, where professions are already undertaking assessment, to help resolve specific issues.
CHAPTER 2

WHAT IS COMPETENCY-BASED ASSESSMENT AND WHY USE IT?

2.1 Competency-based Assessment

In simple terms, competency-based assessment is the assessment of a person's competence against prescribed standards of performance. Thus, if a profession has established a set of, say, entry level competency standards, then these detail the standards of performance required of all new entrants to that profession. Competency-based assessment is the process of determining whether a candidate meets the prescribed standards of performance, i.e. whether they demonstrate professional competence.

2.1.1 Defining Professional Competence

Those professions in Australia that have established competency standards have followed an approach consistent with the definition of competence that underpins the thinking in the series of NOOSR Research Papers. This definition is as follows:

A competent professional has the attributes necessary for job performance to the appropriate standards.

This definition includes three key components:

(i) attributes, (ii) performance, and (iii) standards.

(i) The competence of professionals derives from their possessing a set of relevant attributes such as knowledge, skills, and attitudes. These attributes which jointly underlie competence are often referred to as competencies. So a competency is a combination of attributes underlying some aspect of successful professional performance.

(ii) Competence is focused on performance of a role or set of tasks. Within professions there are typically various roles e.g. hospital pharmacist, design engineer, history teacher, etc. Roles comprise a multitude of tasks, which can be further divided into sub-tasks. However, the competency standards developed by the professions in Australia have opted deliberately for an integrated approach. This has meant that analysis into tasks has ceased at the level of relatively complex and demanding professional
activities. The relative complexity of these activities (or elements) can be gauged from the fact that a typical profession involves no more than 30-40 such elements.

(iii) Since the performance of a role and its associated tasks can be judged competent or incompetent, competence requires that the performance be of an appropriate standard. Hence we need performance criteria (or standards) against which competence can be assessed and validated.

Thus, a set of competency-based standards for a profession sets out the performance criteria for a range of elements or key activities within the practice of that profession.

2.1.2 Implications for assessment

Several important implications flow from this definition of professional competence:

(a) Performance is what is directly observable, whereas competence is not directly observable, rather it is inferred from performance. This is why competencies were defined as combinations of attributes that underlie successful performance. (A detailed discussion of the relationship between competency performance and outcomes can be found in NOOSR Research paper No.1)

(b) Competency-based standards for a profession can be established at various levels as required, e.g. entry level, experienced practitioner, specialist.

(c) Both attributes of the practitioner and performance on elements or key professional tasks are essential ingredients of the above definition of competence. This means that attributes of individuals do not in themselves constitute competence. Nor is competence the mere performance of a series of tasks. Rather, the notion of competence integrates attributes with performance. According to this integrated conception, competence incorporates knowledge, skills and attitudes displayed in the context of a carefully chosen set of realistic professional tasks or elements which are of an appropriate level of generality.

Since professional competency standards are based on the idea that competence is a construct which is not directly observable, but rather is inferred from successful performance, it is clear that performance will be important for assessment in many cases. Some of the competency standards, however, will be less easily assessed through performance than others. Equally important will be
the requirement that sufficient evidence be gathered to justify the inference. While evidence from performance will be central to assessment, it may be supplemented by other kinds of evidence. This is in keeping with the integrated nature of these competency standards in which attributes underpin performance. This means that the attributes will often figure prominently in the performance criteria. Thus, in some instances, evidence about possession of attributes, such as certain kinds of knowledge, might usefully supplement evidence of performance.

2.1.3 Asssessing Professional Competence

As the crucial role of credentials in society has become more prominent, assessment has come to dominate education in several important ways. Firstly, the assessment process has become more complex. Secondly, the range of human characteristics that are assessed has increased, e.g. achievement, aptitude, ability, intelligence, personality, motivation, attitudes, etc. Thirdly, the range of uses of assessment has expanded to include:

- passing /failing students
- grading or ranking a population of students against one another
- measuring students' psychological characteristics
- predicting success in future courses /employment
- providing feedback to students /educators
- motivating students
- accrediting institutions
- diagnosing students' strengths /weaknesses

Clearly competency-based assessment of professional competence makes no claim to displace all of these diverse assessment activities that occur in education generally.

Competency-based assessment is the process of judging competence against pre-established performance standards.

The process of competency-based assessment requires the gathering of sufficient evidence about competencies to enable a judgement about competence to be made. Since competence can be inferred from performance, the range and kinds of performance activities that are assessed need to be as varied and sufficient in number as is required to make the inference safe. It is important to note that performance need not only be thought of as workplace based; it can extend to performance equivalents including simulations, case studies etc.
2.1.4 Competency-based Assessment Methods

While competency-based assessment methods will be considered in detail in later chapters, it is appropriate to make some brief general points here. As a general rule in competency-based assessment, we should always try to select the methods that are most direct and relevant to the performance being assessed. For example, in medicine, patient diagnosis requires a performance assessment, whereas the interpretation of a pathology report can be assessed through a written test, thereby matching the assessment method with the type of behaviour being assessed.

A general principle underlying the validity of assessments is that the narrower the base of evidence for the inference of competence, the less generalisable it will be to the performance of other tasks. For instance, performance on paper-and-pencil tests in any profession will probably be too narrow a base for assessing occupational competence. Sadler (1987, p.192) notes an important source of the temptation to use a narrow evidence base: ‘A preoccupation with objective testing encourages the substitution of surrogate or indirect measures for the real thing’. Hence, in accordance with this general principle, it is recommended that a mix of methods such as the following be used for providing evidence on which to infer competence:

- Direct observation of work activities
- Skills/work sample tests
- Projects/assignments
- Evidence from prior learning
- Log books
- Records of achievement/portfolios

The practicalities of setting up a competency-based assessment system are dealt with in later chapters.

From the foregoing, the sharp contrast between competency-based assessment and traditional norm-referenced assessment should be evident. Whereas competency-based assessment assesses the performance of an individual against pre-established criteria, norm-referenced assessment is concerned with comparing the performance of an individual against the performance of the group.
2.2 Uses of Competency-based Assessment

A profession that develops a sound program of competency-based assessment should be better equipped to:

(i) Assess the competence of people with non-typical/non-formal/experience-based qualifications;

(ii) Develop a systematic career path within the profession from novice through various levels to expert or specialist. The career path may also extend to the sub-professional level;

(iii) Enable entry to and/or progression within the profession to become competency-based;

(iv) Plan and organise an effective internship or professional year at the end of the formal university course (where this is applicable);

(v) Provide an assessment system responsive to the needs of the profession and the public it serves;

(vi) Assist continuing professional education (CPE) in the following ways:

   (a) Enable clear objectives for CPE programs to be set that meet the real needs of the profession,

   (b) Provide a means of assessing effectiveness of competencies gained through CPE courses based on achievement and performance levels attained,

   (c) Provide a way of accrediting genuine self-initiated/self-managed learning that is relevant to the profession,

   (d) Enable delineation of a career path from novice through to expert, so that the role of CPE vis-a-vis initial courses can be clarified,

   (e) Provide a basis for national planning of CPE allocations from the resources of the profession,

   (f) Provide evidence of the contribution of CPE to furthering of professional standards, and
(g) Enable CPE programs to be adapted quickly to meet changing labour market requirements.

Summary
This chapter has defined competency-based assessment and related it to the integrated conception of professional competence. In addition some of the basic principles and potential uses of competency-based assessment have been outlined.
CHAPTER 3

COMPETENCY-BASED ASSESSMENT ISSUES

This chapter discusses some of the major issues related to competency-based assessment and shows that in each case a well designed competency-based assessment system can overcome potential problem areas.

3.1 Competency-based Assessment and the Inference of Competence

Competence is not something that is directly observed. Rather, competence is inferred from performance. In this respect assessment of competence is similar to other kinds of assessment in that procedures are used to test the validity and reliability of the inference. If these procedures are followed, then assessment of competence is as 'objective' as any of the alternatives. Those who criticise competency-based assessment on the grounds that it involves inference are apparently unaware that this is the case for all typical assessment methods. Tests of knowledge, for example, usually sample only a fraction of the required knowledge, then on the basis of a score that is typically well below 100%, an inference is made as to whether or not the student knows enough to be assessed as satisfactory. (For more similarities between tests of knowledge and competence assessment see Wolf, 1989.)

Hence competency-based assessment, in common with other types of assessment, involves inference that is subject to error. In all cases, the solution is to gather the kind of evidence that will allow for a safe inference. (The reliability of inferences about competence is taken up in section 3.6 below). The validity of competency-based assessment is a related issue to which we now turn.

3.2 Competency-based Assessment and Validity

Broadly speaking, the validity of an assessment method refers to the extent to which it measures what it is supposed to measure. Presumably, those who consider that competency-based assessment is inherently invalid think either that the competency standards are invalid or, if not, that attempts to measure them are invalid. Clearly if the competency standards are invalid, then competency-based assessment cannot correct the error. The integrated approach to competency used by the professions in Australia seeks to identify attributes as well as key functions and activities, and to combine these in a holistic set of competency standards. If competency standards based on the integrated approach (as outlined in NOOSR Research Paper No 7) do reflect the actual
richness of professional practice, then competency-based assessment founded on this approach is at least trying to measure what it is supposed to measure. The question then becomes whether it is possible to measure what is described in the integrated professional competency standards. There would seem to be nothing about the nature of what is described in the integrated professional competency standards that would prevent it being measured in principle. Later chapters of this guide describe procedures which, if implemented, will enable such integrated measures to be made. In addition, more detailed discussion of the validity of competency-based assessment will be provided in chapter seven.

3.3 Performance Assessment

According to Berk (1986) performance assessment is defined as follows:

*Performance assessment is the process of gathering data by systematic observation for making decisions about an individual.*

There are five key elements in this definition. First performance assessment is a *process*, not a test or any single measurement device. Second, the focus of this process is *data gathering*, using a variety of methods. Third, the data is collected by means of *systematic observation*. The emphasis is on direct observational techniques, though pen and paper tests may also be employed in the assessment. Fourth, the data is integrated for the purpose of making specific *decisions*. These decisions should guide the form and substance of the assessment. Fifth, the subject of the decision-making is the *individual*, usually an employee or a student, not a program or product reflecting a group's activity.

In any performance assessment process the first step is to specify the individual decisions to be made. For a case of competency assessment, this means deciding which aspects of the competency standards are to be assessed. The second step in the performance assessment process is to tailor the measurement and data collection strategies so that sufficient information is provided to make decisions.

Any sound performance assessment procedure requires that there has been a thorough analysis of the competencies of the profession to serve as the cornerstone for the assessment. In the case of competency-based assessment, this follows from the establishment of an agreed set of competency standards for the profession. (The NOOSR Research Papers Nos. 1 and 7 describe how this should be done). Assuming that a valid set of competency standards is available, this guide will show how they might be assessed.
Assessment of performance has become a focus of assessment for the medical profession. In the past two decades, there have been many attempts to evaluate the competence of medical graduates. Since the early 1970s, the American Board of Internal Medicine has required that residents' clinical skills in history taking, physical examinations, record keeping, patient management, doctor-patient relations, and overall clinical competence are verified before they can attempt the written examination leading to certification.

Performance assessment techniques of various kinds have become the norm for assessing clinical competence. What has become apparent since the early 1970's, is that clinical competence is a complex phenomenon, which almost always requires the practitioner to use a combination of attributes simultaneously and, in addition, that the practitioners need to adapt their practices to different contexts. Thus it is not surprising that no single assessment technique has been found which can evaluate overall clinical competence. Consequently, the use of planned combinations of techniques, heavily based on performance assessment, has increasingly become the norm both in the United States and Australia. (See Appendix A for a detailed discussion of assessment in medicine)

3.4 Competency-based Assessment and the Assessment of Knowledge

Since competency standards are essentially outcome based, competency assessment will be focused where possible on actual performance and outcomes. But is there a place for knowledge testing in competency assessment?

The assessment process is essentially the generation, collection and interpretation of evidence which is then assessed against the performance criteria. This comparison forms the basis of a judgement which infers competent performance or otherwise. The performance criteria may be taken as a description of the evidence which needs to be collected to make a 'safe' inference. As already indicated, for competency-based assessment, the ideal is for most of this evidence to be collected from actual professional practice. However, due to such things as cost and time constraints, this is not always possible. Where collection of evidence from actual professional practice is not available, the next best sources of evidence are usually those based on simulations of professional practice, e.g. a mock trial for lawyers to assess advocacy skills, simulated interviews with 'patients' to assess the communication skills of doctors. But even these methods may be inadequate to fulfil the range and conditions necessary for adequate assessment of the performance criteria.
This leaves us with what is sometimes called the assessment ‘gap’, i.e. the difference between the amount of evidence which we can reasonably and reliably collect from performance (whether collected from actual professional practice or from simulations of professional practice), and the amount of evidence which is needed to make a safe inference of competence.

This assessment gap may be partly filled by supplementary evidence (e.g. oral questioning, open written answers, multiple choice questionnaires) that tests knowledge and understanding. This additional evidence can be added to the performance evidence to enable a safe inference of competence. It should be noted that supplementary evidence will be required in most cases and should not be seen as unusual. Such evidence may be evidence of knowledge but it may also be evidence of procedures and attitudes.

Competency-based assessment can put candidates into situations in which they are required to comprehend, apply, analyse, synthesise and evaluate data and information. Far from downgrading the importance of knowledge, competency-based assessment offers the possibility of assessing the full range of knowledge inputs in a performance context. In short, possessing knowledge is part of being competent as is the acquisition, storage and application of knowledge.

3.5 Process and Outcomes in Competency-based Assessment

While it is true that the main focus of competency-based assessment is outcomes, it is equally true that there are cases where processes are important and need to be assessed, along with whatever else is involved in reaching the outcomes i.e. the combinations of knowledge skills and attitudes. For example, following the required procedures is vital in laboratory analysis of medical samples. Likewise the process of correctly positioning the patient is crucial in radiography.

Criteria for assessing processes might include:

- appropriate groupings of knowledge which underlie the process
- accuracy;
- speed of performance;
- choice of correct techniques;
- the proper sequence of techniques;
- adherence to occupational health and safety standards.

Hence competency-based assessment will usually employ both process-oriented assessment methods and outcome-oriented assessment methods (Swanson, Case
Various examples of both process-oriented and outcome-oriented assessment methods are described and discussed in this guide in Chapters 6 and 7.

3.6 Competency-based Assessment and Attitudes/Values

It is difficult to imagine any occupation where attitudes or values are not important. However, attempts to measure values and attitudes in isolation are notoriously unreliable. This has led some people to assert that competency standards should be restricted to assessment of knowledge and skills. This poses an apparent dilemma for competency standards - omit attitudes and values and be invalid, or include them and be unworkable. The integrated approach to competence provides a solution. In this approach, attributes appear in the performance criteria for elements of the occupation. Experience has shown that where attitudes such as ‘empathising with the patient’ are important, they can be included in the performance criteria for appropriate elements. In fact ‘empathising with the patient’ is not as difficult to assess in realistic professional contexts where it is an important part of the performance of the element.

Valid assessment of attitudes will also be assisted by longitudinal and multiple assessments. Longitudinal and multiple evidence of attitudes and values may be gathered by a variety of methods:

- Direct observation of work activities;
- Supervisor assessments/ratings;
- Evidence from prior achievements;
- Oral questioning;
- Written tests;
- Self-reports; and
- Practicum, internship, professional year.

Far from being a weakness of competency-based assessment, it may well turn out that a major advantage of well-constructed competency standards that they can facilitate the reliable assessment of attitudes and values.
3.7 Implications of Assessing Against Competency Standards for Overseas Recognition Procedures

Where overseas qualifications are based on the traditional assessment of knowledge it is not always clear what they mean in terms of the capacity of the professional to practise effectively. Conversely, where the qualifications include performance based assessment, then it may be possible to undertake only limited additional performance assessment, i.e. areas from the Australian standards not covered in the performance assessment in the candidate’s country of origin could be tested as appropriate.

Under a competency-based approach, tests which are devised to give overseas entrants the right to practice should include assessment of performance. Tests of knowledge can be used as supplements where it is felt that the performance does not provide enough evidence to make a safe inference of competence.

In addition to these conceptual issues, there will be practical issues involved in the choice of assessment methods for the overseas trained.

Professions will need to decide whether the amount of time and expertise needed to keep up-to-date with the changing nature of the qualifications is greater than the costs of undertaking a performance assessment of the overseas trained. As the knowledge explosion which has characterised some professions continues, knowledge assessment could be even more difficult than it has been in the past as courses may change more quickly to meet these needs.

If professions decide to substitute a standards–based assessment model for a qualifications based model, further practical issues will be need to be considered.

- If time and money are limited and high levels of reliability are required, then the most efficient methods are indicated. This means pen and paper tests based on the competency standards (like a MCQ—multiple choice questionnaire) may be favoured, even though they may be less valid than some other more direct methods. However, it may be possible to persist with the more direct methods, e.g., in the case of medicine, an OSCE (objective structured clinical exam), if some adjustments are made. It may be possible to spend less time with each patient. It may be possible to make do with only one examiner where there would normally be two.
• If candidates cannot be tested in their own countries they would presumably be expected to come to this country at their own expense. This may discriminate against a large number of candidates particularly those from the less developed countries. Of course in the slightly longer term, with the development of communications technology, such as interactive satellite television, many of these problems may be solved.

• Two-tiered assessment should be considered. Restricted competency-based screening could be used to identify the clearly competent and clearly incompetent and more refined tests used for the remainder. This may mean using a computerised test of some kind in the candidates country of origin followed by a skills test in Australia if there is adequate performance in the first assessment.

• Whatever the cost restrictions it will be important not to rely too much on evidence from one source but to derive assessment judgements from a combination of tests.

• The issue of acceptability within the profession needs to be considered. Evidence from the Australian nursing profession suggests that it takes a good deal of training and involvement over a considerable period of time before members of the profession will accept changes to long held practices. In the assessment of overseas professionals this will presumably mean widespread consultation and publicity about the changes in emphasis of the strategy.

• In Australia skills tests have been used for some considerable time to assess overseas qualified practitioners in a number of professions. There have, however, been doubts in some professions about their validity. For example, in the Dietetics profession, for over a decade there has been a skills test which assessed counselling skills. The profession’s concern has been that the counselling test in fact tested a knowledge of English rather than counselling per se. Since standards have been developed for Dietitians it is now clearer what this counselling consists of and presumably a more valid assessment can be designed.

Summary
This chapter has considered a range of key issues which need to be addressed when preparing a competency-based assessment strategy.
CHAPTER 4

AN OVERVIEW OF THE ASSESSMENT PROCESS

This chapter presents a summary of the steps which need to be undertaken when developing a competency-based assessment strategy for a profession. The following diagram provides an outline of the assessment process.

Figure 4.1 Steps in developing an assessment strategy
Preliminary Step. Decide on what standards to use and to whom they will apply

Decisions need to be made by the profession about who is to be assessed. For example, will the appropriate standards apply only to overseas trained professionals or will they be applied by registration boards (where they exist) for internal applicants? Similarly where competency standards have been developed for more than one level of the profession, agreement needs to be reached on which standards the individual will be assessed against. A preliminary screening interview may be useful to decide on the appropriate level of assessment for each candidate.

Step 1 Deciding on a framework for assessment

This step involves two linked activities:

a. Grouping elements
It is not easy to design an assessment strategy to address all the elements in a profession’s competency standards (see Chapter 5). Likewise, it may not be possible or necessary to assess all the performance criteria or all the contexts in which the professional will be expected to demonstrate competence. Thus there will be a need to group the elements and performance criteria in some way. This is a necessary prerequisite to an integrated assessment strategy, though, as the steps which follow demonstrate, there are other considerations which need to be taken into account before such a strategy can be realised.

b. Deciding on critical elements
It may be necessary to decide which elements and performance criteria are the most critical since for practical reasons everything will not be able to be tested. This step is dealt with in Chapter 5.

An example of how these factors have been taken into account is outlined in the Dietetics case study in Appendix F and the Veterinary Science case study in Appendix D.

Step 2 Examining the available assessment methods

Step 2 is concerned with locating the methods suitable for the assessment of the elements and performance criteria identified in Step 1, with examining the intrinsic advantages and disadvantages of the methods, and with considering which combinations of methods will be most suitable to assess the attributes identified. This step is dealt with in more detail in Chapter 6.
Both this and the next step are guided by two basic principles:
• the assessment should be as integrated and holistic as possible, i.e. that combinations of attributes should be assessed simultaneously;
• the assessment should be as direct as possible, i.e. as close as possible to the real work situations in which these combinations of attributes are employed.

A key question arising from these principles will be how well the methods can assess the capacity to function appropriately across the uncertain situations of professional practice. Inevitably not all the attributes needed to so function will be able to be assessed holistically and directly. Therefore, combinations of methods need to be considered which will provide the range of evidence on which a judgement about competence can be made.

Examples of such combinations can be found in the Appendices. In Appendix A, for example, the methods used by the Royal Australian College of General Practitioners (RACGP) are outlined. These include both direct and holistic methods, such as simulated clinical tests of diagnosis and communication competencies, video taped consultations with real patients, as well as indirect methods like multiple choice questionnaires, and written and verbal reports on case histories.

**Step 3 Selecting the methods**

In addition to the principles outlined above, consideration needs to be given to a range of other factors before a selection of methods can be made. Some of these are practical questions, others are issues of principle. (See Chapter 7.)

Amongst the practical factors, are the costs of the assessment strategy, the time available to assessors, the confidential nature of the work of some professions which limits the capacity to undertake assessment in real situations and so on. There is also a range of principles which need to be considered. These principles include the need to ensure that the methods are not biased against particular groups of candidates, that the assessment should enhance, wherever possible, the future learning of candidates and that the methods should be acceptable to the candidates.

Professions will need to weigh all the factors before making a decision about the combinations of methods to be employed. Once this has been done it will be possible to draw up a table which combines the things to be assessed with the methods that will be used to assess them.
An example of such a table is taken from the RACGP and is reproduced in the Figure 4.2. The vertical axis refer to assessment methods and the horizontal axis refers to the attributes being tested. Knowledge is tested by multiple choice and a diagnostic interview, while psychomotor skills are tested using a physical examination (see Appendix A for short descriptions of all the RACGP assessment methods).

![Candidate X](Image)

<table>
<thead>
<tr>
<th>Case C</th>
<th>Knowledge</th>
<th>Interpretation</th>
<th>Problem Solving</th>
<th>Affective</th>
<th>Psycho-Motor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Choice</td>
<td>7.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.8</td>
</tr>
<tr>
<td>Clinical Interpretation</td>
<td></td>
<td>7.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Managed Problem</td>
<td></td>
<td></td>
<td>7.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnostic Interview</td>
<td>1.5</td>
<td>1.6</td>
<td>9.2</td>
<td>6.3</td>
<td></td>
<td>etc</td>
</tr>
<tr>
<td>Management Interview</td>
<td></td>
<td>1.2</td>
<td>3.2</td>
<td>6.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Examination</td>
<td></td>
<td>1.5</td>
<td></td>
<td></td>
<td>7.3</td>
<td></td>
</tr>
<tr>
<td>Practice Assessment</td>
<td>1.5</td>
<td>2.2</td>
<td>3.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9.3</td>
<td>13.0</td>
<td></td>
<td></td>
<td></td>
<td>etc</td>
</tr>
</tbody>
</table>

**Figure 4.2 Assessment methods (adapted from the RACGP Manual)**

The table is also instructive in how integrated/holistic assessment can be applied. A Diagnostic Interview, for example (where simulated patients are introduced to the candidate) will test knowledge, interpretation, problem solving, and affective attributes. (See Appendix A for details of how the RACGP assess these attributes.)

**Step 4 Judging candidates performance**

One of the key issues in assessing the performance of candidates, centres on the use of professional judgement (Chapter 8 deals with this issue in detail). The concern about lack of objectivity of assessors has traditionally been a dominant factor in most assessment strategies. This has led to the development of highly
structured strategies, such as the use of checklists, standardised questions in MCQs and so on which are aimed at reducing the need to make judgements. While it is desirable for assessors to be as objective as possible, this is not incompatible with the exercise of professional judgement. Such judgement will be aided by the specification of performance criteria and cues, and possibly by the use of rating scales.

Our suggestion is, that if the steps outlined earlier are followed, then the assessment strategy should be valid and that this will make concerns about standardisation largely unnecessary. Nevertheless the training of assessors as outlined in Step 5, will increase the reliability of the assessment process.

Step 5 Managing the assessment process.

A strong relationship between educational providers and the relevant professional bodies can be a useful preliminary step to the development of a management strategy for competency-based assessment. The following are tasks that need to undertaken:

- developing and implementing training for assessors;
- selecting and accrediting assessors;
- developing handbooks for assessors and candidates;
- developing procedures for recording results and providing feedback to candidates;
- constructing appeals procedures;
- developing procedures for the assessment of prior learning and credit transfer; and
- evaluating and refining assessment methods.

All these issues are discussed in Chapter 9. In addition the role of training in the establishing of a competency-based assessment strategy is discussed in Appendix C. The need for such training will vary depending on the culture and traditional practices of the profession. Appendix C outlines briefly the steps taken in the training of assessors for the nursing profession.
CHAPTER 5

DECIDING ON A FRAMEWORK FOR ASSESSMENT

5.1 Introduction

The process of assessing competence determines whether an individual can actually perform in accordance with established professional standards. This chapter provides some suggested frameworks for assessing against these competency standards. The emphasis is on:

- defining the purposes of assessment;
- using assessments that genuinely represent professional practice;
- using a table of specifications as a framework; and
- combining forms of assessment.

The kinds of evidence gathered for assessment will depend on:

- the nature of the competency standards;
- agreement as to the ultimate purpose of assessment; and
- selection of assessment methods considering feasibility, reliability, validity and utility of available methods (See Chapters 6 and 7 for detailed discussions).

5.2 Competency Standards

Competency standards consist of units, elements and associated performance criteria. However these may not by themselves provide a sufficient basis for an assessment strategy. Under the National Training Board format there already exists a provision to document a range of variables that have principally covered issues such as context. In the second edition of the National Training Board’s Policy and Guidelines (1992) provision is made for the development of an evidence guide which summarises inter alia, the contexts for assessment and other required evidence of competency e.g. particular aspects of knowledge and skill. It will depend on the nature of the profession’s work as to whether it needs to use these parts of the format in the development of its strategy.

This classification of professional performance facilitates assessment and this relationship is depicted diagramatically in Figure 5.1. Generally, the content of the assessment will be determined by the elements of competency; the standard of performance is determined by the performance criteria linked to each
element; and the context is defined by the range variables. In a profession's competency standards the elements and performance criteria are organised within separate units based usually on functions. However, a framework for assessment may draw elements and associated performance criteria from a number of units together.

Figure 5.1. Competency standards as a basis for assessments
(National Training Board Policy and Guidelines, 2nd Edition)

5.3 Different Approaches for Developing the Assessment Framework

Four ways are proposed:

1. By considering individual assessments for each element and performance criterion and then seeing what might be common in terms of assessment activities;

2. by grouping context of performance (i.e. case situations, particular service delivery or client groups);

3. by grouping inputs such as the skill or knowledge base;
4. by grouping outcomes or the ways in which various elements link up into complete processes or products.

5.4 Individual Assessment for Each Element

Approach number 1, considers individual assessment methods for each element and performance criterion which is usually followed by a decision about which of them are critical/best for inferring competency.

The requirement to assess every element and the performance criteria linked to it may become unwieldy in circumstances where there are numerous elements with multiple performance criteria. Debling (1992) has discussed the issue of whether a separate piece of evidence should be collected for each performance criterion. He has argued that the assessment should focus on whole work roles rather than an assessment system which ‘atomises’ the collection of evidence.

In the standards being developed for professions, every element is important but some will be critical. Therefore, some guidelines will be required for assessors. Percival (1992) has described how for the nursing profession an Observer Training Workshop was conducted to guide the use of tacit knowledge or professional judgement in the process of assessing competence in relation to the standards.

In any event, decision rules need to be derived from the professional standards. The two examples below indicate some of the possible combinations of elements and the types of decision rules that may need to be specified. Each set of rules indicates a different focus for assessment.

(i) **Element A**
Performance criterion (i)
Performance criterion (ii)
Performance criterion (iii)
Performance criterion (iv)
**Decision rule:** Performance criteria (i) and (iv) might be sufficient to satisfy competence for this element.

An alternative is to nominate some criteria as critical and supplemented by others (see element B).
(ii) **Element B**
Performance criterion (i)
Performance criterion (ii)
Performance criterion (iii)
**Decision rule:** Performance criterion (i) and any one other criterion.

### 5.5 Ways of Grouping Elements

In a typical set of standards there may be around eight units and some 40 elements with 70-80 identifiable performance criteria for the various elements. Thus it will not be possible to assess each of these.

A **way around this problem is to group elements and criteria according to methods 2, 3, and 4 (contexts, outcomes, inputs-see above)**

One way of visualising and then integrating the elements and performance criteria which is common to these methods is through a Table of Specifications or a spreadsheet of elements and performance criteria. Such tables of specifications are not new to educational testing (e.g., Athanasou, 1992a). For the most part they have been one-way or two-way tables of specifications encompassing the content and/or objectives of a curriculum.

An example of a table of specifications for an Associate Editor has been prepared and is shown in the table below. The advantage of the table of specifications (units/elements/performance criteria) is that it provides a format for linking assessment to the content and context of an occupation. It is intended to provide a ‘blueprint’ for the assessment specifications. This is an example of a context based grouping.

#### 5.5.1 Context based grouping

For each element in a table of specifications there is listed the related performance criteria and in this hypothetical example only a total of five performance criteria are listed for ease of presentation. Two contexts of newspaper and magazine are presumed. The Sample Table of Specifications below indicates the key areas of assessment and potential commonality or overlap across the contexts. In this case it also indicates that assessment of performance criteria for certain elements can only occur within one context.
### Figure 5.2 A Sample Table of Specifications

Source: Australian Standard Classification of Occupations Dictionary, 1986 p. 115

Another example of a context based grouping is from medicine. The Royal Australian College of General Practitioners (Fabb, 1991) has developed a three dimensional table of specifications which can be used to ensure that appropriate emphasis is given to the clinical areas and problems encountered in general practice. This is shown in Figure 5.3 (below).

A similar model to this may be used by other professions to develop the contexts for assessment. Ideally, assessments should be chosen which cover a large number of cells within a spreadsheet and which take into account elements and performance criteria across units. For instance, it is conceivable that a case study might cover more than one unit and assess various elements simultaneously.

<table>
<thead>
<tr>
<th>ELEMENTS</th>
<th>Newspaper Context Criteria</th>
<th>Magazine Context Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT A</td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Assigns reporting staff to obtain coverage in accordance with policy</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Prepares rosters of reporting staff</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Approves leave and expenses</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Hires casual reporting staff</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>UNIT B</td>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Reviews copy for publication and conformity with rules of style and format</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Edits copy, writes headline, plans layout of items in appropriate section of publication</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>UNIT C</td>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Attends meetings and events related to particular area of expertise</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Prepares news and feature copy</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Writes articles or critical reviews</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
**Clinical competencies**

1. Understanding the individual, the family and the community.
2. Analysing problems.
4. Adopting a preventive approach.
5. Accepting the responsibilities of a family doctor.

**Skill in managing health problems in all age groups**

- Pregnant woman
- Neonate
- Infant
- Pre-school child
- School child
- Adolescent
- Young adult
- Middle-age person
- Older-age person

**Figure 5.3. A table of specifications for general practice competencies, health problems and intellectual skills**

Source: Royal Australian College of General Practitioners (Fabb 1991, p. 16)

### 5.5.2 An Inputs Approach to Grouping

Inputs constitute such things as knowledge/problem solving, performance/skills, and attitudes. Some examples of performance criteria which could be used to construct an inputs matrix are grouped below. The first illustrates the categorisation of elements from a hypothetical unit into categories of problem solving, performance and attitudes:

#### PROBLEM SOLVING

- 'uses data to evaluate options which meet needs’
- 'formulates plans and regimens which are consistent with individual goals’

#### PERFORMANCE

- 'negotiates client oriented goals and strategies’
- 'communicates needs to appropriate persons’
ATTITUDES
‘creates an environment conducive to effective counselling’
‘conducts session which enables clarification of issues’.

A second example of grouping by inputs comes from an entirely different profession, commercial aircraft pilot (see Figure 5.4), and illustrates how diverse performances may be integrated. No claim is made for the accuracy or representativeness of these categorisations.

By grouping elements into meaningful categories, a search can then be made for common assessment methods. This grouping can be on the basis of underlying broad outcomes, such as communication in professions where dealing with people is important. Grouping could be made also on the basis of contexts in which professions work, on the frequency of activities etc. It will be up to each profession to make a decision as to the need for grouping and the nature of that grouping on the basis of its own professional practice requirements.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observable Technical Performance</td>
<td>Examines/prepares flight plans</td>
</tr>
<tr>
<td></td>
<td>Conducts routine check of instruments</td>
</tr>
<tr>
<td></td>
<td>Obtains departure clearance from tower</td>
</tr>
<tr>
<td></td>
<td>Tunes radio navigation equipment</td>
</tr>
<tr>
<td></td>
<td>Attempts smooth take-off</td>
</tr>
<tr>
<td></td>
<td>Adjusts aircraft configuration for climb/cruise</td>
</tr>
<tr>
<td></td>
<td>Pilots aircraft to destination</td>
</tr>
<tr>
<td></td>
<td>Reports flight progress to air traffic control</td>
</tr>
<tr>
<td></td>
<td>Prepares aircraft for landing</td>
</tr>
<tr>
<td></td>
<td>Controls application of brakes and reverse thrust</td>
</tr>
<tr>
<td></td>
<td>Taxis aircraft to parking position and shuts down engines</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Reviews passenger and cargo manifest</td>
</tr>
<tr>
<td></td>
<td>Examines maintenance release</td>
</tr>
<tr>
<td></td>
<td>Signs necessary certificates accepting responsibility for safety</td>
</tr>
<tr>
<td></td>
<td>Completes remainder of cockpit checks and paper work, recording flight time</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>Assesses fuel load required and advises</td>
</tr>
<tr>
<td></td>
<td>Examines meteorological situation</td>
</tr>
<tr>
<td></td>
<td>Studies operational advice regarding availability of navigational aids, operational facilities and procedures</td>
</tr>
<tr>
<td></td>
<td>Assimilates information from instruments and other sources to keep aircraft on track and flying safely</td>
</tr>
<tr>
<td></td>
<td>Calculates best descent point</td>
</tr>
<tr>
<td>Attitudes Work Habits</td>
<td>Briefs crew</td>
</tr>
<tr>
<td></td>
<td>Manages cockpit resources</td>
</tr>
<tr>
<td></td>
<td>Maintains good public relations with passengers</td>
</tr>
<tr>
<td></td>
<td>Briefs crew on descent approach pattern to be flown and allocates tasks</td>
</tr>
</tbody>
</table>

Figure 5.4 Categorisation of Competencies for a Pilot
5.6 Comparing Approaches to Developing A Framework

An example of a profession which used a number of grouping approaches is the New South Wales Lawyers' Specialist Accreditation Board, which is in the process of developing assessment frameworks. In their development, one group felt comfortable with specifying an assessment method for each element (approach 1); another group felt equally comfortable with grouping elements into common clusters, (approaches 2, 3, and 4). In the case of the lawyers the different approaches led ultimately to a similar assessment framework i.e. a range of methods which assess a number of elements and performance criteria. Appendix F outlines how the Dietetics profession have grouped their elements of competency.

5.7 Conclusion

The aim of this chapter has been to highlight the need for an integrated assessment framework. The assessment methods can then assess a range of elements and performance criteria, rather than collect evidence for each element and performance criterion. The following chapter considers the assessment methods available and goes on to link these to a spreadsheet of units, elements and performance criteria (Figure 6.3). This process also addresses validity of the assessment process in order to ensure that the assessment methods that will be selected maximise the three types of validity: content validity, construct validity and criterion validity.
6.1 Introduction

All of the existing forms of assessment used by a profession could potentially be appropriate for use in a competency-based approach. This is because it is not the methods of assessment which are competency-based, but rather the way they are used, the emphasis given to different methods, and the way in which results are interpreted. The emphasis on performance-based approaches however, does call for a revised approach to strategies in assessment.

Performances in professional knowledge, problem solving, practical and technical skills, as well as in the area of professional attitudes, ethics or values can be addressed by five major forms of assessment classified by the National Council for Vocational Qualifications (Guidance Note 5, Assessment of Competence, p. 5). These are:

- evidence of prior performance;
- direct observation;
- tests of technical skills;
- simulations; and
- questioning.

A distinction is made between the form of assessment and the many methods of assessment that have come to be used in education and training. Each form of assessment (e.g. questioning) encompasses a number of general methods (e.g. written tests) and an even larger number of specific approaches (e.g. essay, short answer, multiple-choice, true-false, completion, matching, incomplete blanks, alternate choice). The specific approaches and their characteristics have been dealt with in NOOSR Research Paper No. 2 (Masters & McCurry, 1990).

The purpose of this chapter is to highlight the advantages in assessment, when:

- the methods are directly faithful to the performances being assessed;
- due regard is given to both the product and process in performance;
- performance provides evidence of knowledge and attitudes; and
- integrated assessments are used to cover multiple elements.
6.2 Integrated Approaches to Assessing Performance

The first step in examining the assessments available is to ascertain which methods are most capable of assessing competence in an integrated manner.

Integrated approaches seek to combine knowledge, understanding, problem solving, technical skills, attitudes, and ethics in assessment (see Figure 6.1).

![Figure 6.1. Unifying features of an integrated assessment](image)

Theory and practice across disciplines are combined in an integrated or 'holistic' assessment, which can be characterised as:

- problem oriented;
- interdisciplinary;
- embracing professional practice;
- covering groups of competencies;
- focusing on common circumstances;
- demanding analytical abilities; and,
- combining theory and practice.
The question to be asked is:

**Is there an integrated assessment that can be used which reflects the competencies to be assessed?**

The integration comes about by having methods which assess a number of elements and all their performance criteria simultaneously. For example, in the case of a community social worker, standardised cases are used to assess elements such as conducting individual interviews, monitoring the progress of clients, and compiling case records and reports. These standardised cases are also capable of measuring a number of attributes at the same time, such as attitudes, communication skills, background knowledge and so on.

Integrated forms of assessment have been developed in a number of professions, but especially in the area of clinical competence. In the medical context, methods which include more integrated types of assessment than formal examinations are:

- **Patient management problems** (i.e. written simulations of patient problems);
- **Objective Structured Clinical Examinations**, which comprise a flexible examination structure comprising a circuit of 5-15 minute patient stations. This method assesses a candidate’s skills, attitudes and knowledge through the undertaking of a variety of tasks, such as history taking, physical examination, data interpretation, specimen handling, emergency procedure (see Figure 6.2); and,
- **Standardised patients** (i.e. simulated or real patients trained to present any mixture of problems in an unvarying manner - Barrows, 1971).
Written Patient Situations
Diagnose and manage allergic reaction
Identify type of tube and define use
Interpret x-ray
Interpret neurological chart
Interpret ECG
Write orders for management of constipation
Interpret clinical signs in photograph
Interpret biochemical results and treat disorder
Write orders for post-operative fluid management
Interpret fundal photograph and treat cause

Patient Stations
Examine patient for breast lumps
Examine patient with sciatica
Educate parent of newly diagnosed epileptic
Demonstrate technique for lumbar puncture
Examine cardiovascular system in patient with valvular heart disease

Figure 6.2 Outline of an Objective Structured Clinical Examination
Source: Newble & Swanson (1988, p. 329)

Integrated assessments are not confined to medicine. In accountancy, much of the performance that needs to be assessed is difficult to observe in an examination. The co-operative education component of various degree courses attempts to overcome this. At the Royal Melbourne Institute of Technology, students undertake a twelve month industrial experience which is assessed in two ways: through a report organised by the employer and assessed by the Faculty, and an evaluation by an industrial tutor. From 1993, tutors will be given a rating scale to help them evaluate the performance in a number of areas:

Technical: knowledge of the industry, problem solving, application of theoretical concepts to practical problems;
Organisational: ability to plan, attention to detail, ability to meet deadlines;
Communication: clarity of written communications, ability to work with associates, effectiveness of oral communications;
Attitudes: initiative, willingness to accept responsibility, ability to follow instructions.
Tutors rate performance on a scale from 1 to 5 on each element and make an overall judgement of strengths and weaknesses.

Another example of integrated assessments is the clinical component of the National Veterinary Examination. This assesses practical performance in simulated workplaces (a teaching practice of one of the universities). It is not possible to specify in detail and in advance which methods will be integrated and applied to assessment for a particular profession, but examples are listed below under the five major forms of assessment:

**QUESTIONING TECHNIQUES:** projects/assignments; problems; case studies

**SIMULATIONS:** simulated patients; simulated workplaces; situational exercises

**SKILLS TESTS:** standardised patients; work samples; objective structured clinical examination

**DIRECT OBSERVATION:** supervisor evaluations; practice/professional year/internship/industrial experience

**EVIDENCE OF PRIOR PERFORMANCE:** portfolios; log books, supervisor/referee reports.

### 6.3 Specific Approaches for Assessing Elements

We deal in this section with a number of the grouped approaches to developing an assessment framework as outlined in Chapter 5 (ie. 2, 3 and 4). The main emphasis is on the inputs grouping approach, although a few examples are given of the process approach. Specific examples are not given for the context approach as this approach will vary considerably across professions.

Three broad groups containing 20 approaches for assessing different elements of competency are defined below and within each of these there are further sub-sets of assessment methods.

**METHODS OF ASSESSING SKILLS**
- Direct observation of work activities
- Skills/work sample tests
- Projects/assignments
- Log books
- Records of achievement/portfolios
METHODS OF ASSESSING KNOWLEDGE
• Direct observation of work activities
• Case studies
• Reports
• Evidence from prior learning
• Written tests
• Oral questioning
• Simulations

METHODS OF ASSESSING ATTITUDES
• Direct observation of work activities
• Supervisor assessments/ratings
• Evidence from prior achievements
• Oral questioning
• Written tests
• Self-reports
• Practicum, professional year
• Simulations

The different forms and methods of assessment can then be related to a spreadsheet of units, elements and performance criteria, as in the illustration in Figure 6.3, where various methods have been allocated to combinations of elements and performance criteria.

![Figure 6.3 Relating assessments to elements and performance criteria](image-url)
There may be concern in some professions as to the role of factors such as knowledge and understanding in work performance. Knowledge has been viewed as the capacity to maintain a wide and highly organised store of information, factual and procedural details (e.g., Glaser, 1984). Knowledge and understanding will be significant in the assessment process. However, Cox (1990, p. 540) suggested that 'rigid examination structures are inappropriate for clinical tasks requiring eclectic, responsive skills, controlled by clinical judgement'. It appears that knowledge will be important:

- as an additional or alternative source of evidence, wherever performance evidence is exhausted; and,

- in rare and critical emergency events which cannot be simulated (e.g. a chemical engineer preparing designs for chemical process systems such as those used to remove and separate components).

Knowledge and understanding can also be conceived as inherent in performance. Any observation of performance is likely to provide evidence of knowledge and understanding, as well as skills. Accordingly, performance assessments can be viewed as integrated activities.

6.4 Assessing Process and/or Product

It may also be necessary to decide whether the process of performance needs also to be assessed in particular instances.

Process could involve, in the case of a biochemist, the isolation and assay of hormones, metabolites and other substances. In this case, achievement is judged by the way in which a biochemist performs the task, as well as the quality of the final product. Ways of performing a task might be assessed by criteria such as accuracy or lack of error; speed of performance; choice of correct techniques; the proper sequence of techniques; adherence to regulatory and occupational health & safety requirements. Performance assessment methods that focus on process can include observation, skills tests, projects and log books.

The product component, for the biochemist again, could involve the preparation of a scientific report based on observations and experiments. The level of achievement is judged by assessing the quality of a piece of work. Performance assessment methods that focus on the product typically involve ratings and can include work sample tests, projects, portfolios and records of achievement.
6.5 Considering Advantages and Disadvantages

Assessment methods fall into certain categories which have inherent advantages and disadvantages. Specific features of assessment methods are discussed in NOOSR Research Paper No. 2 (Masters & McCurry, 1990). Some of the advantages and disadvantages with respect to criteria of fidelity, extent of integration, and the ability to assess problem solving, interpersonal skills and practical skills are summarised below.

**EVIDENCE OF PRIOR PERFORMANCE**

**Advantages:**
- Can provide high level of fidelity (as based on real work experience);
- Focuses on products and processes;
- Can provide high level of integrated assessment;
- Can provide direct evidence of demonstrated performance;
- Can provide evidence of knowledge/understanding;
- Permits complex assessments; and
- Generates evidence to prove differing skills.

**Disadvantages:**
- Comparability of competencies may be difficult to establish; and
- Inferences may not generalise to other circumstances

**DIRECT OBSERVATION**

**Advantages:**
- High level of fidelity;
- Focuses on products and/or processes;
- Can provide high level of integrated assessment;
- Allows assessment of attitudinal and interpersonal skills;
- Allows assessment of practical and technical skills;
- Offers realistic evidence of competence;
- Allows supervisor evaluation of problem solving;
- Focuses on relevant performance criteria;
- Gives indirect evidence of knowledge/understanding; and
- Permits complex assessments.

**Disadvantages:**
- Circumstances of observation may be too specific; and
- May require lengthy and costly assessments for reliability.
SKILLS TESTS

Advantages:
- Moderate level of fidelity;
- Focuses on products and/or processes;
- Can provide moderate level of integrated assessment;
- Provides opportunity to observe specific elements of competence;
- Assesses interpersonal and problem solving skills;
- High correlation with written exams;
- Provides assessment of practical and technical skills;
- Provides indirect evidence of knowledge/understanding; and
- Provides realistic simulation of activities.

Disadvantages:
- Specific skill may not permit inference of overall competence;
- Skills may not permit generalisation to varied circumstances; and
- May require lengthy and costly assessments for adequate reliability.

SIMULATION TECHNIQUES

Advantages:
- Low to moderate level of fidelity;
- Can provide high level of integrated assessment;
- Assesses data gathering, hypothesis creation, and problem solving;
- Allows assessment of attitudinal and interpersonal skills;
- Allows assessment of practical and technical skills;
- Provides indirect evidence of knowledge/understanding;
- Permits complex assessments;
- Gives opportunity to observe specific elements of competence;
- Provides realistic simulation of activities; and
- Overcomes issue of having non-registered persons practising in actual clinical setting with 'live' patients.

Disadvantages:
- Tasks may not offer realistic evidence of competence;
- May not generate sufficient evidence to prove competence; and
- Inferences may not generalise to other circumstances.

QUESTIONING TECHNIQUES

Advantages:
- High level of fidelity for cognitive skills;
- Focuses on knowledge, comprehension, problem solving;
- Assesses performance across a range of circumstances;
Provides evidence to demonstrate transferability; Elicits extra evidence to demonstrate understanding; and Supplements other assessment methods.

**Disadvantages:**
Provides low level of integrated assessment; Few workplace performances are amenable to assessment by written examination; Difficult to assess values and attitudes; Cannot assess interpersonal performance; Cannot assess psychomotor skills; Cannot assess technical performance directly; Does not fully measure problem solving skills;

<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>METHODS OF ASSESSMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observable</td>
<td>Minimum 1500 hours, six month simulator check</td>
</tr>
<tr>
<td>technical</td>
<td>Six month route check</td>
</tr>
<tr>
<td>performance</td>
<td>Licence renewal</td>
</tr>
<tr>
<td></td>
<td>Six month asymmetric check (i.e. engine failure)</td>
</tr>
<tr>
<td></td>
<td>90 day requirements for non-directional beacon</td>
</tr>
<tr>
<td></td>
<td>VHF omni-directional radio range and instrument landing system</td>
</tr>
<tr>
<td></td>
<td>90 day requirements for take-offs and landings both day/night</td>
</tr>
<tr>
<td></td>
<td>5 hours instrument flight time</td>
</tr>
<tr>
<td></td>
<td>Medical check</td>
</tr>
<tr>
<td></td>
<td>In-flight assessment by check captain or simulator</td>
</tr>
</tbody>
</table>

| Problem solving     | Simulator                                                                            |
|                     | In flight problems assessed by check captain                                         |

| Knowledge           | Aircraft systems - oral questioning                                                  |
|                     | Civil Aviation examinations (meteorology 70%; navigation 70%; flight planning 70%; air legislation 80%) |

| Attitudes Work habits | Oral questioning on company policy and requirements                                  |

Figure 6.4 Some methods of assessment for pilot competencies  
Source: Athanasou (1992b)
Some methods eg. multiple choice tests have low correlation to professional competency; and May not detect serious deficits in understanding.

It may be helpful again to work through an example. The table above indicates some possible forms of assessment for the pilot competencies. (Note that this is another example of an input grouping approach.)

In this example, grouped categories served as the basis for deciding specific forms of assessment and direct observation has been emphasised. If direct observation were not possible, then a combination of assessment forms would be considered (e.g. simulation, written tests, etc.). A wide range of assessments can be used with these elements and it is possible to encompass some elements within one or more forms of assessment.

### 6.6 Combining Methods of Assessment

It may not always be possible to combine elements into cohesive groups. Alternative approaches are to select forms of assessment for each of the elements and then try to combine them; (this is approach number 1 as outlined in Chapter 5); secondly, the common elements may be integrated and a search made for methods of assessment (see grouping approaches in Chapter 5). Professions are encouraged to use those forms of assessment which are most direct and which encompass the greatest number of elements.

It is unlikely, whichever approach is adopted, that professional competency can be assessed using only one method of assessment. For some elements/ performance criteria it may not be possible to devise or implement integrated forms of assessment. These require a combination of assessment methods, as in the case of the Australian Pharmacy Examination Council’s procedure, which consists of evidence of prior learning, a written examination covering basic pharmaceutical sciences, English language requirements, a period of practical experience, and a practical and oral examination covering pharmacy practice.

Where integrated assessments are not possible, the suggested strategy is that they must be replaced by a combination of methods which assess the problem solving, practical skills and attitudinal factors in the profession.

- Each separate method will then contribute relatively independent data relating to the assessment of professional competence.
• The amount of information collected should suffice to remove any ambiguity in decision-making.

6.7 Steps in Examining the Assessment Methods Available

The steps in examining the assessment methods available are to ascertain which methods are most capable of assessing competence in a direct and integrated manner.

• Step One
Is there an integrated method of assessment that can be used which reflects the competencies to be assessed?

• Step Two
Does the assessment method directly address the performance criterion/criteria?

• Step Three
Where integrated forms of assessment are not feasible, is there a combination of methods which assesses the ability to apply knowledge, practical skills and attitudinal factors in the profession?
CHAPTER 7

SELECTING AND EVALUATING THE ASSESSMENT METHODS

7.1 Introduction

This Chapter deals with Step 3 of the assessment model outlined in Chapter 4, how to select and evaluate assessment methods. Having examined the various options using the information in Chapter 6, there is now a need to ask questions about the quality and practicality of the variety of methods. The three important criteria with respect to evaluating competency-based assessments focus on the feasibility, reliability and validity of the methods of assessment:

• How feasible is this method of assessment?
• Do the results of this method provide reliable judgements of competence?
• How valid are the results of this method for assessing competence?

Issues of reliability are important for the stability and consistency of results, while validity relates to the nature of the results. Feasibility (i.e. cost benefit) relates to the circumstances and organisation of assessment. The purpose of this chapter is to outline some criteria for evaluating an assessment method.

There are six general issues that need to be considered in selecting the methods of assessment that will best suit a profession (Athanasou & Hawke, 1992):

• The amount of evidence required (e.g. repetitions, the context for performance) needs to be specified;
• The adoption of particular methods of assessment may mean that some people are not treated equally;
• The assessment process will take time to establish credibility;
• Costs estimates are not straightforward, and each of the competency assessment methods has particular associated costs; and
• Measures may be required to detect apparent anomalies in assessment outcomes (e.g. accuracy of different assessments, relationship between judgements and on-the-job performance).

Some specific issues that are highlighted in the following pages are: bias, feasibility, screening tests, weighting, acceptability, learning and reliability/validity issues. A detailed consideration of testing issues is contained in the *Standards for Educational and Psychological Testing* (1985), prepared by a joint committee of the American Educational Research Association, the National Council on Measurement in Education, and the American Psychological Association.

7.2 *Assessment Bias*

Differences in performance across groups may feature within assessment methods or components in the assessment process and lead to suspicion of test bias. Test bias is a systematic error in the assessment process.

Investigation of bias in each form of assessment is an important consideration whenever there are gender, race, or other minority group differences in selection. Osterlind (1983) noted that bias '... is conceptually distinct and operationally different from the concepts of fairness, equality, prejudice, or preference or any of the other connotations sometimes associated with its use in popular speech' (p. 10). Test bias can be considered from the viewpoints of overall performance, bias at the level of particular questions, content bias, or biased use of results. The warning sign for the fairness of an assessment is when there is adverse impact (i.e. the proportion of people selected from two groups varies substantially).

A comprehensive discussion of test bias is beyond the scope of this section and the reader is referred to Suen (1990) for a discussion of item bias and to Ghiselli, Campbell and Zedeck (1981) for an introduction to equal opportunity and concepts of validity and fairness.

7.3 *Feasibility of Assessment*

Feasibility issues have been interpreted broadly and relate to the utility of using an assessment method. Considerations that have been included under this heading are: acceptability; scoring; cost issues; security; administration; and learning implications.
Administrative considerations need to be balanced against the technical advantages of some forms of assessment. For example, it may be the case that direct observation is the preferred assessment technique but the logistics of assessment may preclude this method where candidates are overseas.

The time and costs of preparing assessment methods need to be balanced against the time and costs of judging performance. As an example, there is little benefit to be gained in using multiple choice tests with small candidatures. The time and cost of preparation of satisfactory multiple choice questions for a small group far exceeds the time and cost of marking short answer questions.

Acceptability criteria focus on whether the form of assessment is consistent with community expectations, is achievable by the profession and is acceptable to candidates. Some forms of assessment will be excluded for such reasons of practicality, even though they may provide the most valid inferences for competency.

The methods of assessment used will also impact on the approach to studying and learning within a discipline. A reliance on formal examinations tends to encourage rote learning, recognition and recall, and Cox (1990, p. 540) has noted that ‘the examination focus becomes the structure’. Any shift towards more assessment of practical skills, and those attributes involved in problem solving situations, may serve to foster the application of knowledge and understanding to performance and bring about important changes in learning. Benefits of this kind must also be considered when judging the feasibility of an assessment method.

7.4 Reliability of Judgements of Competency

By and large, most forms of assessment likely to be selected by a profession will have reasonable ‘reliability’, especially if multiple assessments of competencies are undertaken. For instance, classroom tests constructed without specific reference to reliability have been observed to have internal consistency reliability coefficients of around 0.6 to 0.85. This compares favourably with values of published standardised commercial tests.

To achieve reliability in assessments of practical performance, the available evidence points towards the need for longer assessment procedures. Newble and Swanson (1988) investigated the psychometric properties of various assessments and their results are summarised in the table below.
<table>
<thead>
<tr>
<th>Type of Test</th>
<th>Time</th>
<th>Intra class Correlation</th>
<th>Items per hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple choice</td>
<td>1 hour</td>
<td>0.76</td>
<td>75</td>
</tr>
<tr>
<td>Short answer</td>
<td>1.5 hours</td>
<td>0.68</td>
<td>44</td>
</tr>
<tr>
<td>Patient station</td>
<td>0.5 hours</td>
<td>0.31 - 0.5</td>
<td>10</td>
</tr>
<tr>
<td>Static station</td>
<td>1 hour</td>
<td>0.38</td>
<td>10</td>
</tr>
<tr>
<td>Clinical test</td>
<td>3 hours</td>
<td>0.73</td>
<td>-</td>
</tr>
</tbody>
</table>

Clinical test = short answer + patient + static stations

**Figure 7.1** Assessment time and reliabilities in medicine

Source: Newble & Swanson, 1988, p. 329

From other results of Newble and Swanson, it would appear that, for the medical profession to achieve test reliabilities of around 0.8, requires a multiple choice test of 1.5 hours, a short answer of 3 hours, patient stations of 6 hours, and static stations of 8 hours. [Colliver and his colleagues (1989) have calculated that for a consistency level of around 0.8, 42 cases requiring 21 hours of examination time were required].

In addition to the duration of assessment methods, there are other factors which have been recognised to affect the reliability of assessments. For instance, reliability should be improved by objectivity in grading performance with aids such as marking guides, rating scales and checklists.

From the competency perspective, the reliability issue is the consistency of the competent/non-competent decision. If candidates sit for a theory examination, practical assessment and clinical placement, our concern is whether these forms of assessment produce consistent judgements of competency. Hambleton and Novick (1973) have proposed an index for calculating the reliability of the competency/non-competency decision. This is the percentage of candidates for whom decisions of competence are consistent between two assessments.

The amount of evidence collected in a competency-based assessment is also relevant for reliability. Sometimes there is greater concern for the objectivity of our assessment methods, than for the quality and amount of the evidence required. The evidence provided in competency-based assessments must be sufficient to ensure judgement of consistent performance to the standard required across a range of situations. Therefore, to ensure reliability evidence is needed of repeated performance or we may be able to draw upon a number of different sources of evidence. Maatsch, Juang, Downing and Munger (1987)
considered that performance assessments on five to seven cases were required for the general competence of casualty physicians.

Other aspects of reliability (eg internal consistency, test-retest reliability) relate to the assessment method. These have not been ignored and it is recognised that they will form part of the management of the assessment process. If the assessment system is perceived as a process, then it is possible to continually improve the forms and components of the assessment over a period of time. This includes:

- the evaluation of individual items, sub-tests or components within the competency-based assessment; and
- the evaluation of the reliability and validity of the overall assessment decision.

At the question level, item banks can be maintained where large scale testing is undertaken. Item banks refer to the development of a store of assessment questions (especially multiple-choice questions) together with the associated statistics for each question. This storage of questions increases with each subsequent administration and allows the development of subsequent versions of assessments with specified characteristics. This system has been readily adapted in a number of computer packages.

This section has raised a number of issues that are relevant to the reliability of the judgements of competency. In summary, these are:

- from the competency perspective, the reliability issue is the consistency of the competent/non-competent decision;
- the available evidence points towards the need for longer assessment procedures;
- the dependability index with cut-off is a measure of consistency for criterion-referenced assessments;
- an index for the reliability of the competent/non-competent decision can be calculated; and
evidence provided in competency-based assessments must be sufficient to ensure judgement of consistent performance to the standard required across a range of situations.

7.5 How Valid are Judgements of Competency?

Arguably, the most important issue in competency-based assessment is the issue of validity. Hambleton and Rogers (1986) have identified poor assessment practices that relate to competency-based assessments: (a) the use of convenient assessment formats; (b) using norm-referenced approaches to determine reliability; (c) the ad hoc setting of standards; (d) a failure to deal with validity issues; and (e) failures in matching scores from different forms of an assessment. They considered that there were two useful ways of constructing assessments that contributed to validity:

- Choosing assessments that optimally discriminate between 'competent' and 'non-competent'; and

- Choosing assessments that sample in a representative manner from the domains of competent performance.

This calls for considerable content and measurement expertise to evaluate:

- Congruence between assessments (e.g. items) and the standards;
- Representativeness of the assessment;
- Item bias;
- Methods or components that are flawed;
- Level of difficulty of the assessment;
- Ability of the assessment to discriminate; and
- Consistency of results/length of assessment.

The validity of an assessment can only be inferred; it cannot be measured, and the focus is on accumulating three different types of validity evidence - content, criterion, and construct validity. One particular aspect of validity that is important for the evaluation of assessment methods is that of criterion validity.

Criterion validity relates to the ability of an assessment method to predict future performance or performance in a related context.
One way of measuring criterion validity is to compare results from one assessment method to results of subsequent assessments and the same candidates. As an example, candidates’ performance in the part I examination of the National Board of Medical Examiners (U.S.A) has been compared with performance in subsequent assessments and preliminary results indicate correlations of 0.58 with quality of care, 0.29 with residency ratings, 0.23 with supervisor ratings, 0.45 with other examinations, and -0.66 with a specialty exam (Nungester, Dawson-Saunders, Kelley and Volle, 1990, p. 725).

Knowing the extent to which each method of competency assessment overlaps is especially useful where integrated methods of assessment covering multiple elements are adopted. High intercorrelations might be sought between different assessments of the one competency. However, high correlations between methods (around 0.8) would also indicate that little unique information is being added for decision making purposes. It might be preferable to seek methods of assessment which correlate highly with the overall judgement of competency, but which are themselves lowly intercorrelated.

The correlation between different forms of assessment are only moderate, and probably less than expected. The concurrent validity (i.e, criterion validity) between various medical assessments is shown in the table below and may serve as a guide for other professions.

<table>
<thead>
<tr>
<th>Tests</th>
<th>Observed Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCQ and short answer</td>
<td>0.59</td>
</tr>
<tr>
<td>MCQ and patient stations</td>
<td>0.33</td>
</tr>
<tr>
<td>MCQ and static stations</td>
<td>0.42</td>
</tr>
<tr>
<td>Short answer and patient stations</td>
<td>0.4</td>
</tr>
<tr>
<td>Short answer and static stations</td>
<td>0.5</td>
</tr>
<tr>
<td>Patient and static stations</td>
<td>0.35</td>
</tr>
</tbody>
</table>

**Figure 7.2 Concurrent validity of assessments**

Source: Newble & Swanson 1988, p. 331

The ability of an assessment method to discriminate has also been considered in criterion-referenced testing. Brennan (1972) developed a mastery/non mastery discrimination index for items in a test. This rationale can be extended to evaluate the ability of an assessment method to discriminate competency. If a criterion has been set, then it is possible to see whether an assessment method discriminates by comparing the number of persons who passed an assessment
with the overall judgement of competence from all assessments (Athanasou, 1992b).

Content validity is enhanced by using a table of specifications. Construct validity is improved by utilising the appropriate forms and methods of assessment, which capture the essence of the competency. Criterion validity focuses on evaluating the power of an assessment method to discriminate competent from non-competent performers. Some practices for consideration could include:

- Choosing assessments that optimally discriminate competent from non-competent performers;
- Choosing assessments that sample in a representative manner from competent performance; and
- Utilising content and measurement specialists.

### 7.6 Compromise in Assessment

Each profession will have its own basis for weighing the various assessment issues. Factors to be weighed include: content validity; acceptability to the community; the profession and candidates; objectivity in assessment/scoring; reliability of judgement; costs; administration and scoring.

There is no universal method of performance assessment and the process of assessment is largely one of balancing conflicting demands and compromising fidelity.

- It is recognised that there will be errors of measurement in whatever approach is adopted; and
- Compromises may be required between the acceptable costs of testing vis a vis the acceptable cost of errors in judgement.

The challenge to those constructing an assessment strategy is to arrive at a balance of complementary assessment methods which give the highest possible levels of validity and reliability while meeting the practical constraints faced by the profession.
CHAPTER 8

JUDGING CANDIDATES' PERFORMANCE

8.1 Introduction

This Chapter deals with Step 4 of the assessment model outlined in Chapter 4. It examines how to judge whether the outcomes of the assessment of an individual reach the required standard. The limitations of scoring are outlined and a standards-referenced assessment is introduced. This considers the 'pattern of performance taken over a series of testing episodes and assessment tasks' (Sadler, 1987, p. 193).

Competency-based assessments share a common background with the criterion-referenced or standards referenced approach to assessment in education which compares an individual's performance with a pre-determined criterion or standard. Competency-based assessments search for 'measurements that are directly interpretable in terms of specified performance standards' (Glaser & Nitko, 1971, p. 653) and the judgements are designed to reflect performance, rather than to make comparisons.

Judgements of competence are based on the decision rules derived from the standards.

8.2 Limitations of Scoring

It is common to assess candidates in terms of marks (or scores) on assessments. This section highlights some of the limitations of scoring. The most serious problem is that much of the richness of the assessment evidence is reduced to an artificial number.

In many respects the allocation of marks, their addition and the standardisation of scores across assessments are difficult to reconcile to the aims of assessing competency standards. The quantitative nature of measurements and scores can be misleading, and when assigned to a performance may have an artificial aspect. Moreover, the technical assumptions underlying scores are substantial and should not be underestimated.

- Scores may not allow the decision maker to consider performance in terms of competency standards.
• Scores may mask the quality of performance and may be counterproductive in assessment decisions.

• Scores may contrast with the thrust of competency-based assessment which seeks to compare each candidate’s performance with agreed standards.

There are other significant limitations with traditional scores as a measurement approach (some of these have been overcome with latent trait and item-response models - see Hambleton, Swaminathan & Rogers, 1991).

• Scores or marks only provide an approximate measure of the direction of performance.

• Scores or marks on different assessments represent different ‘units of performance’ and should not be combined.

Furthermore, it is well known that scores at various points (e.g., 10%, 50%, 90%) have different errors of measurement. The results of many different forms of assessment purport to provide marks as a description of performance but these only express some ‘magnitude’ of performance and not a unit of performance.

Accordingly, there appears little justification for averaging gradings from different assessments to obtain a composite average, which is then used to determine competency. One response has been to give standardised scores and to total these to produce an aggregate across assessments. This may not always be possible in competency-based approaches and in workplace assessments which are not scored.

There is also an issue of whether scores should be provided for elements or whether merely a pass/fail assessment will suffice. The use of scores in assessments appears to be linked to a tradition of numerical assessment in education; however, with respect to competency assessment, scores may be superfluous. Even when the quantities have some meaning, a judgement must be made as to whether an individual has satisfied a criterion or standard of performance.

Finally, there is nothing in the nature of assessment of competency standards which prevents professionals being accorded recognition for exceeding the minimal level of competence. Some professions (e.g. teaching) are considering the possibility of developing proficiency and expert level standards. Similarly
there is nothing to prevent a profession from distinguishing between marginally competent and obviously incompetent. All this can be done without recourse to scores.

8.3 How can Competence/Non Competence be Determined?

There are a number of traditional methods for determining competence /non competence, and cut-off points. Of fundamental importance to assessment will be the establishment of cut-off points for effective performance (this issue was dealt with in greater detail in NOOSR Research Paper No. 2).

Quantitative techniques for setting minimally acceptable performance levels on multiple-choice examinations were developed by Nedelsky (1954) and Angoff (1971). These methods have a number of disadvantages. Many of them have been adapted from classroom testing, and suffer from the limitation that they are not readily applicable to occupational contexts. Furthermore, methods such as the Nedelsky Method focus on establishing a standard for a single test or competency. It is clear that competency for a profession is multivariate in nature and that various interacting forms of assessment (mainly qualitative) are required. It may be more appropriate, therefore, to rely on professional judgements informed by the descriptive competency standards used in association with cues, exemplars and evidence guides.

Standards-referenced assessment (Sadler, 1987) calls for professional judgements of performance and appears to overcome the limitations in what might at first glance appear to be a ‘subjective’ exercise. Standards-referenced assessment acknowledges the richness and ubiquity of qualitative aspects of assessment when considering complex skills. It overcomes traditional measurement problems by moving away from numerical scores, to professional judgements based on agreed benchmarks.

Limitations in judgements are minimised by providing stable reference points. Sadler outlines two complementary methods that hold promise for the professions as a basis for standards-referenced assessment specific exemplars and detailed verbal descriptions of performance quality.

**EXEMPLARS** ‘... key examples chosen so as to be typical of designated levels of quality or competence’ (p. 200).

**VERBAL DESCRIPTION** ‘... a statement setting down the properties that characterise something of the designated level of quality’ (p. 201).
Throughout this process, considerable professional judgement is required as to whether an approach meets the assessment objective and also is feasible for the profession. The advantage of the standards-referenced approach to assessment is that it relies on defined standards, which obviate the need for convoluted scoring arrangements.

If standards have been prepared thoroughly, they should specify both the quality and nature of response required for competent professional performance.

8.4 How Much Evidence is Necessary for Competence?

The issue of the number of performances required to demonstrate competency relates to the reliability of an assessment (see also chapter 7). The amount of evidence collected must be sufficient to ensure consistent performance to the standard required across a range of situations. In order to ensure reliability, evidence is needed of repeated performances or we may be able to draw upon a number of different sources of evidence. It needs to be decided whether a single correct performance is sufficient for a decision of competency for assessment purposes. Maatsch, Juang, Downing and Munger (1987) considered that performance assessments on five to seven cases were required for the general competence of casualty physicians.

Criteria for the number of competent performances need to be determined.

8.5 Steps in Judging Candidates' Performance

Competency-based assessment is about multiple, performance-based assessments on realistic tasks in natural settings (Cox, 1990, p. 543) and eight guidelines in judging the performance of candidates are listed below.

• Set qualitative rather than numerical standards for performance.

• Assess the whole integrated performance.

• Refer to essential elements to choose examples of performance which are characteristic of the level of competence.

• Refer to performance criteria to specify the properties that characterise performance as competent.
• Determine the number of competent performances required to establish consistent performance.

• A judgement must be made as to whether strengths in one area compensate for weaknesses in another area.

• Candidates who exceed a minimum level of performance will be able to be recognised by a set of competency standards which are at a higher level.
CHAPTER 9

MANAGING THE ASSESSMENT SYSTEM

9.1 Aims for Managing a Competency Based Assessment Scheme

This chapter deals with Step 5 of the assessment model, managing an assessment scheme and evaluating the strategy.

There are a number of key aims to consider when managing a competency based assessment scheme:

• To enable assessors to make decision about whether an individual is competent to practice
• To help the candidate identify their strengths and weaknesses
• To stimulate professional development within the profession
• To provide information to monitor and improve the system
• To provide a system which is open to scrutiny by members of the profession and the public.

In order for these aims to be met, a system for managing the assessment process will need to include:

• A method of training assessors (both initial and ongoing);
• A method of selecting and registering assessors;
• A number of handbooks for both assessors and candidates which outline the assessment methods and expectations of assessors and candidates;
• A procedure for recording results and of providing feedback to candidates;
• A review and appeals procedure;
• A method for developing and testing assessment methods both to improve their capacity to assess existing competency standards and to adapt them to changes in the competency standards as they are revised;
• A strategy for dealing with the assessment of prior learning.
9.2 Training Selecting and Registering Assessors

9.2.1 The Role of Training in Competency-Based Assessment

In a useful set of papers written for the United Kingdom’s Employment Department, Docking (1991), suggests that workplace trainers competent in the field in which they are training, using clearly stated competency standards and observing workplace performance (plus having records of progress and with some independent monitoring of training and assessment standards) can assess in a valid, accurate and meaningful way without further training in assessment.

This is a very useful point for the professions to consider, as it concentrates on the role of judgement based primarily on observation of work undertaken in real settings. Docking’s views may have particular relevance to those professions where experienced practitioners already carry out workplace training and assessment.

There are, however, a number of reasons why we believe that current levels of assessment expertise in the professions will need to be supplemented by training in assessment of competencies, though not of the traditional kind which concentrates on statistics, norm referenced testing and so on.

• Professional competence usually entails the measuring of a complex combination of attributes. These will usually be assessed in a number of performances of different tasks. But at the same time, examiners need to assess the ways professionals bring the attributes together in providing the essence of the professional service;

• The tendency of experts, identified in research in experimental psychology, to forget the earlier stages of development leading to expertise when applying their judgement to performance of competencies i.e. by setting too high a standard.

Some of the potential errors which examiners can make as a result of these reasons, are outlined in the RACGP Manual for Examiners. It should be noted that these are errors which are common to all types of assessment. These include:
• **Marking down the middle**
  This is the tendency to judge candidates as being in the middle of a rating scale. The danger of this tendency is that it prevents candidates offsetting relative weakness in one area of competence with strength in another. As outlined earlier, a holistic assessment scheme should allow for balance between a candidates strengths and weaknesses, with the proviso that competencies which are identified as essential (either because they are fundamental to further development or because they are fundamental to safe practice) must be satisfactorily demonstrated.

• **The Halo Effect**
  This is the tendency to be influenced by a global assessment of the candidate. Thus, if the overall impression is favourable, the examiner tends to rate the candidate highly on all measures. Personal peccadilloes also lead to this tendency, e.g. where a medical examiner feels that no candidate should pass without taking a thorough history, irrespective of the good performance in all other areas.

• **Faulty Calibration**
  This is the tendency to rate early candidates in an examination, too high or too low. Of course, this can be overcome by returning to the original rating after a larger number of candidates have been assessed.

Disparities between examiners are often due to faulty calibration but this can be overcome, to some extent, by a good set of competency standards and cues. It is unlikely, however, that disparities will be eliminated without a training program where the acceptable standards are discussed by the assessors and agreement is reached as to how they will interpret the standards.

• **Failing to Observe**
  Examiners need to develop expertise in observation otherwise much that occurs may be missed. For example, an examiner in engineering or medicine may be untrained in picking up non-verbal cues in communication.

• **Failing to Record**
  Examiners without experience sometimes believe that they will be able to recall better than they actually can, particularly when a large number of candidates is being assessed.
To overcome these and other errors of judgement, specific training is needed. The RACGP Manual suggests two training strategies:

- Discussions of simulated situations;
- Apprenticeship training.

In the first strategy, videotaped consultations can be observed by a group of examiners and discussed afterwards. These discussions can pinpoint things to observe as well as help examiners reach consensus on what constitutes the appropriate standards. In addition role plays can be used for similar purposes.

In the clinical components of the RACGP examinations, an apprenticeship program is used to train new examiners. In the first instance, a novice examiner is attached to two experienced examiners. The novice takes no part in the assessment but does rate the candidate and compares scores afterwards. In the next step, after one year of apprenticeship, the novice is appointed as a junior examiner. After two examinations the junior can be appointed as a senior.

The need for assessor training is evident in the experience with assessment of competence in the nursing profession in Australia. Even with a clear set of competency standards with cues to guide assessors, nurses have experienced difficulty in coming to terms with using professional judgement to assess competence holistically. The major reason for this is that there has been a long tradition of concentrating on using objective criteria and checklists to assess the technical ability of nurses.

To overcome this problem, all the state boards of nursing agreed, in late 1990, to organise a series of workshops on how to assess competency standards. The original idea behind the workshops was that participants would be taught how to develop assessment instruments and how to train other nurses in how to use the instruments. In fact these workshops have been aimed at challenging the preconceptions of nurses about the nature of assessment and the role of the professional in assessment. Rather than having a distinct group of specialist assessors, the favoured view is that the philosophy of lifelong learning/professional development should include each nurse becoming an assessor within the profession. On this view, assessing would become an increasing part of nurses’ work in various positions the hold as they rise through the career structure.

Consistent with this philosophy, workshops for training of assessors have been open to all interested nurses, though most interest has come from experienced nurses in senior positions. In the workshops, participants are taken through a
process where they are helped to develop a view of assessment which is holistic and research oriented. Assessors develop their own exemplars on the basis of observation of nurses in action. Through a process of reflection and abstraction, these are eventually translated into standards. Then, participants consider ways in which what they have identified as competent practice, might be assessed. Participants are encouraged to experiment with assessment methods between workshop sessions and discuss these with the group. A network has been established of all those who complete the assessment workshops. The profession is still to consider whether accreditation of assessors will be necessary.

9.2.2 Selection and Accreditation of Assessors

In developing an assessment strategy it is important to consider the breadth and depth of experience required of potential assessors. Currently, assessors within the professions are selected by the various associations and boards. In almost all cases, assessors are experienced practitioners or senior academics. It is difficult to generalise, but in most professions, there is an attempt to ensure that the assessors are representative of the various contexts in which practice is undertaken. For example, in the Institute of Chartered Accountants of Australia, the workshop leaders are chosen amongst those who express interest in reply to advertisements in professional journals/newsletters. The people who set the examination are senior members of the profession who are drawn from private and public practice. They are paid by the Institute to set and mark examination.

In the medical profession, examiners of undergraduates are drawn from the senior staff at teaching hospitals who are given university adjunct appointments. This is an honorary position which is regarded as being prestigious by the members of the profession.

In the teaching profession practising teachers sometimes assist in the assessment of undergraduates (assessment is predominantly carried out by academics). Teachers in schools are, however, currently paid by the universities to supervise practice teaching, and the potential exists for this role to become one in which assessment is undertaken as a matter of course.
As is mentioned above, in the case of nursing, there is an attempt to turn every practising nurse into a potential practising assessor. As nurses move through the career structure they will be expected to undertake more assessment. Nevertheless, it is felt that to ensure consistency in special situations (such as disciplinary hearings) that there be a core assessor group should be established state-wide or nationally.

Under a competency-based assessment system, assessors should undertake a training process prior to being allowed to assess, unless they can demonstrate they already have assessment competencies of the type outlined below. Assessors should be able to:

- develop assessment activities which are appropriate to what is being assessed and which take into account the practical limitations of assessment methods;

- undertake an assessment of a professional which calls on them to exercise judgement as to whether the candidate has satisfied the criteria specified in the profession’s competency standards; and

- avoid the common pitfalls associated with all assessment.

Obviously such competencies depend on the knowledge and understanding of the competency standards of the relevant profession.

Such training could be run by the professional association/registering boards/universities, who would act as their own quality controllers.

There are many potential errors of judgement which will need to be avoided if holistic competency-based assessment of the type recommended in this guide is to be valid and reliable. The training of assessors will be an important part of such an assessment strategy. It could be of particular importance in those professions where traditional assessment are based on objectified strategies aimed at avoiding judgement. (See Appendix C for an account of how training in assessment using professional judgement was undertaken effectively in the nursing profession).

The selection and accreditation of these assessors should be a matter for the professional associations and the registering bodies, but it would be desirable for these processes to be based on clear, publically available criteria.
9.3 Development of Assessment Handbooks

An essential part of an assessment scheme is a handbook for both assessors and candidates. There are currently a number of examples which could be adapted for use in a competency based assessment scheme. One of these is the *Manual for Examiners* of the RACGP (1991) (Hereafter the *Manual*). It outlines the principles of assessment that guide the College, the details of the system and how it has been developed as well as the problems that assessors face in competency-based assessment. A manual of this kind would be an important supplement to the training of assessors particularly in those professions where a competency-based system is new.

The *Manual* also has a chapter on each of the assessment methods (see Appendix A) which explains the objectives of the method, how to prepare for and implement it and how it should be assessed. For example, the sort of preparation needed to ensure that the Management Interview runs smoothly, includes instructions on: how to introduce oneself to the patient; the instructions to be given to the candidate; the time to be given to the candidate to comprehend the case history; instructions to be given to the role player and how to conduct oneself during the interview. There are also detailed instructions on how to develop a management interview assessment.

For the assessing phase, examples are given of the scales which should be used to rate candidates plus an explanation, with cues, of the sorts of things to look for. For example, the *Manual* explains to assessors that:

*It is necessary for the candidate to have an appreciation of the total problem. The candidate must make an overall diagnosis before he/she can effectively manage the situation. For example, a candidate interviewing a patient of a recently diagnosed epileptic child may fail to make an overall diagnosis of the physical, psychological, family and social aspects of the condition and concentrate exclusively on the neurological aspects of the case...*

With a set of competency standards to guide manual writers, such clear and precise instructions should be quite easy to construct.

The *Manual* also has a section on the analysis of the marking of the variety of methods and a section on feedback to candidates.
It may be desirable to publish a special handbook with actual questions and ‘answers’ to cut down the work of assessors.

In addition to the *Manual*, the College publishes a handbook for candidates and examiners on the physical examination assessment, which outlines the objectives of the method and from a range of situations which could be tested.

The Institute of Chartered Accountants of Australia publishes its *Education Handbook* which outlines all the requirements of the professional year program including detailed instructions for candidates on preparation for the assessments, the conduct of examination and marking procedures. In addition, it has a valuable guide to the levels of knowledge required in topics within the various technical modules. They classify the levels from basic to high and explain their criteria for these levels. For example, the basic level, described as ‘a *fundamental* understanding of the concepts and their practical application’, is needed in the topic ‘Tax Planning’ at the completion of the *Taxation Module*, whereas a high level, described as ‘A *thorough and detailed* knowledge and substantial comprehension sufficient to solve most practical problems...’ is needed in the topic ‘Depreciation’. The existence of competency standards should enable even clearer criteria of great benefit to candidates to emerge.

An assessment kit developed by the nursing profession is outlined in Appendix C.

**9.4 Recording Results and Providing Feedback**

Recording achievement of individuals in a competency assessment can be a relatively simple task particularly if manuals, of the type described above, are developed. If the manuals include rating scales, then assessors have ready made recording instruments.

The individual results on these rating scales can be put together manually or by using computers, as is the case with the RACGP assessment. Other well known examples of manual recording of competencies is the work on profiling achievement undertaken in the UK by the Further Education Unit and the City and Guilds (Broadfoot 1986). However, because the work is at a lower occupational level, (operative to post trade levels) it may not relate closely to the Australian conceptualisation of professional competence.
Of course it is also possible to use quite sophisticated computer based programs to aid recording and decision making. Docking’s (1992) use of ‘SkillLink’ is a good example. This is a simple to use software package for personal computers which can match individuals with jobs, qualifications and training. It can match jobs with award qualifications, and can report any competency deficits for each match.

Whether such a package in its present form would be useful for the professions, given the integrated/holistic nature of the assessment, is open to question. Nevertheless, there is obviously potential in the use of computer technology for recording achievement and facilitating the provision of feedback to candidates.

Feedback is a vital part of any assessment process, and the advantage of a competency-based system is that it enables candidates to identify strengths and weaknesses much more readily than does traditional assessment.

In the RACGP assessment, which consists of 8 separate assessment events each with many parts, marks are entered for each item in each event weighed according to a predetermined criteria and total scores on each event, calculated by computer. In addition, marks are aggregated for each of the identified attributes. A matrix is thus developed which helps assessors to make decisions, though examiners comments also need to be taken into account (see Step 3, Chapter 4).

Feedback is provided after assessors examine the matrix and the individual examiners’ comments. Because the weaknesses are clearly identified, candidates rarely fail a segment/event a second time. As the Manual puts it:

While this feedback is time consuming, this service is considered to be an essential part of the assessment system since it encourages candidates to undertake remedial learning to correct deficiencies in their performance. Thus the examination has an educational value over and above its value as an assessment process

9.5 Appeal Procedures

A review of the way the assessment was undertaken or an additional assessment by an experienced official group of assessors may need to be undertaken.

The first type of review system has been developed by the New Zealand Association of Social Workers. This association has recently moved to a
competency-based assessment system which has the following elements: the completion of a questionnaire designed to assist applicants to reflect on their experiences; the engagement of referees to help validate the social work practice; preparation of an example of social work practice; examination of practice by a Competency Assessment Panel; recommendation by the Panel to the Board of Competency; feedback to applicants on the Board’s decision.

Dissatisfaction may arise with the procedures and recommendations by the Panel or with the decision of the Board. If it is in the first area, an appeal can be made to the Board which will review the Panel’s recommendation. If the problem is perceived to be the Board’s decision, an appeal can be made to the National Executive of the Association which can overturn the Board, request it to reconsider, or uphold the decision.

Simpler procedures are possible however. On balance, it is probably preferable to simply give the candidates another assessment by a different group of assessors and only if there is disagreement in the finding of the two groups should there be an appeal to a constituted body to resolve the discrepancy.

9.6. Recognition of Prior Learning

Recognition of prior learning acknowledges what individuals know or can do before undertaking a task, job, or course of study or training, wherever or however they may have acquired their knowledge or skills. For both universities and the professions, RPL is a process of assessing relevant attributes and/or competencies gained by adults through formal or non-formal study, work and/or life experiences. The outcome of an RPL assessment may be used to determine entry to a particular profession, counted for advanced standing and so minimise the time needed for completion of a university course or confer eligibility for further professional training. For professionals whose experience or qualifications are from overseas—or not easily or commonly recognised for whatever reason—applying RPL in a competency framework would enable valid assessment of the current competencies, as well as relevant previous experience.

Assessing competencies based on RPL will usually be highly individual in orientation, relying heavily on personal documentation by applicants and professional judgement by the assessors. A major feature of competency-based assessment is the explicit defining of performance criteria, and/or standards within a specific context. RPL usually uses a wide range of assessment methods which may not reveal the kind of evidence required by the explicit criteria.
contained in competency standards. To accommodate these factors without jeopardising reliability, RPL often includes more than one method of assessment to give a holistic picture of the applicant's competence. The use of the learning portfolio and interview as well as the use of projects and observations and other supportive documentation are examples of how RPL assessment methods can be integrated in a competency-based approach.

RPL methods should strive for the same levels of validity, reliability and equity achieved for other methods in the competency-based assessment strategy.

There are seven main stages which could be applied to making judgements about a person's competency using RPL methods.

1. Advice and information stage

A handbook detailing the competencies, applicant requirements and RPL procedure should be made available. Using this information, applicants should be able to compare the competencies required with those already acquired from work or other learning experiences and consider what might constitute valid evidence to support their case.

Regular orientation sessions could also be organised to inform potential applicants about what RPL is and how it works. This would help ensure that applicants understand the requirements of the professional body and the standard expected for each component. The form of the RPL assessment screening procedures can also be used as a way to discourage applicants unlikely to be successful.

2. Documenting learning from experience

Candidates for RPL assessment would be required to present a learning portfolio. The early parts of this portfolio will cover their educational background, as well as current and previous workplace experiences, and should identify demonstrated attributes, interests and other influences. Depending on the purpose it may also include a chronology of significant events, including employment, formal and informal training, volunteer work, membership of associations, etc). This account often triggers past learning events and hopefully highlights relevant areas of competence. The evidence identified in the applicant's learning portfolio enables a decision to be made about whether their learning matches the listed competencies at the stated standards. The
performance indicators and range statements in the competency standards should assist applicants in preparing their portfolio.

The following key questions need to be addressed by the applicant:
- Which of my learnings best fit the competencies required?
- What available evidence exists to prove this?
- What else would need to be located?
- Who could verify this?

If the relevant competencies were gained in the workplace, these headings may help clarify them in relation to the credit they are seeking:

<table>
<thead>
<tr>
<th>Description of duties, tasks, activities in the workplace</th>
<th>Description of skills and learning demonstrated</th>
<th>Evidence and documentation available or obtainable</th>
<th>Competencies the evidence relates to</th>
</tr>
</thead>
</table>

It is only after evidence for RPL has been assembled that recognition of competencies can be decided on.

3. Organising the evidence

Applicants may provide direct evidence (what they have produced) or indirect evidence (information about themselves and their competence).

For example, direct evidence for a training manager seeking entry to the management profession might include evidence of work on training manuals or other print or non-print materials; documentation for needs analyses planned, conducted, and evaluated; videos of training sessions; computer programs; inventions; feedback to clients; evaluations; book reviews, journal articles, books, or chapters written or edited; and action research projects managed.

Indirect evidence might include statements from employers; awards, prizes and qualifications; attendance at training programs; newspaper or journal articles; and statements and evaluations from trainees.
In the end, the assessment of the standard and sufficiency of the performance demonstrated by the evidence presented will depend on the professional judgement of the assessor.

4. Assessment

Obviously, the methods of assessment need to match the nature and range of competencies being assessed. Assessors may work individually or in teams and use a variety of approaches. In some cases, only the written documentation is considered—in others a wide range of assessment procedures is used to gather supplementary evidence. RPL takes a holistic view of assessment, rather than a mechanistic one. Few single pieces of evidence can serve as conclusive proof of competence.

Assessment techniques can then be chosen to assist applicants to present evidence in the most effective way. For instance, they might be given a choice of verbal or written assessment to expand on material contained in their portfolio (see Figure 9.1).

In addition to establishing the overall appropriateness of the candidate’s application and the evidence presented, there are a number of criteria which assessors may use to evaluate professional competence:

i) It is important that RPL applicants are not required to fulfil higher standards than other candidates, a tendency which has been observed in other settings where RPL is used.

ii) Assessors need to be assured of the authenticity of any materials being presented by the applicant; especially if they are claimed to have been written or produced by the applicant. Certificates, licences and other documentation also need to be checked.

iii) To confirm the required level of conceptual knowledge, applicants typically must be able to explain concepts in their own words, without using meaningless jargon which can hide gaps in understanding. Applicants need to be able to draw out ideas, principles and concepts that underpin the competencies gained from their experiences.
RPL assessment may primarily appear to be about meeting tightly-documented and relatively easy to assess competency-based standards according to the nominated criteria. However, RPL does not differ from other competency-based assessment methods in that it also relies on assessors' professional judgement, especially where issues of equivalence of competencies may be relevant. For applicants who have gained their professional competence in ways other than formal accredited training, either in Australia or elsewhere, it is conceivable that different yet equally valid knowledge and skills could be employed in professional practice. Assessors need to review their expectations carefully and check that uncritical adherence to tradition and uniformity are not the only reasons for a single correct approach being acceptable.

5. Feedback to applicants

When the assessment process is complete, a written evaluation should be sent to each applicant indicating the result. There should also be documentation of the main reasons for non-recognition of competencies. Assessors need to advise applicants of their results in the shortest possible time-frame.
6. Recording the information

Where prior learning is recognised, this should be identified as such on the student's record of competency to acknowledge that assessment indicated appropriate competency levels had already been achieved.

9.7 Conclusion

There are a number of issues to resolve before each profession can begin the process of developing a coherent competency-based assessment strategy. Ways of assessing prior learning, in particular, will need to be developed by every profession undertaking competency-based assessment.

In order to fulfil the aims of a competency-based assessment strategy, a number of other important things need to be done in conjunction with the development of assessment methods and ways of marking them: the development of handbooks, methods for recording results and provision for feedback to candidates. Professions will find it helpful to refer to existing examples of all of these as a starting point, even if they cannot be copied directly in most cases.
CHAPTER 10

CONCLUSION

The aim of this paper has been to examine issues and give advice to the professions on how they might begin to develop their competency-based assessment strategies. We have tried to present a general assessment model which can be followed by all the professions, but, clearly, it is a model that will lead to different outcomes for different professions. So, there can be no one strategy for competency-based assessment in the professions.

All competent professionals have in common the capacity to exercise what has been called ‘intelligent skill knowledge’ (Elliott, 1990). This is, the capacity to discriminate, discern and apply a knowledge base, technical skills and appropriate attitudes to situations in which they find themselves. A competency-based assessment strategy should be aimed at assessing whether a candidate can achieve this.

This paper has suggested that the assessment methods which are capable of doing this best will be as integrated and direct as possible and will rely on the professional judgement of assessors (informed by the agreed competency standards).

Such methods gather evidence from real life work situations, where possible, or from simulations of real life where complex combinations of attributes are exercised simultaneously. Therefore, in deciding what to assess, the professions should seek to group elements from the units of competence of the profession’s competency standards. As a general strategy it will be inappropriate to assess elements individually and in isolation.

There will be occasions, however, when every profession will wish to examine specific attributes of a candidate. Particularly in borderline cases, assessors will often feel that the evidence that they have been able to gather through holistic/direct methods is not a sufficient basis from which to infer overall competence.

This means that in all professions there will be the need to use a combination of methods. Precisely how many will vary enormously depending on such things as the nature and complexity of the profession as well as practical issues such as numbers of candidates, and time available to assessors.
Professions will need to rely on the professional judgement of their assessors. The existence of a valid set of competency standards with their specific criteria and cues will help ensure that this judgement is reliable.

The management of the assessment process—selecting, training and accrediting assessors, recording results, developing handbooks and so on—is an essential part of the assessment process.

In summary, while competency based assessment throws up some challenges to the professions, the rewards are potentially very substantial. The creation of a genuinely valid competency-based assessment strategy can yield great benefit, not only to the professions, but to the whole community.
SUMMARY OF KEY STEPS

1 DECIDE ON A COMPETENCY BASED FRAMEWORK FOR ASSESSMENT

• determine the organisation of the units, elements and performance criteria to be assessed for the profession;

• determine the essential elements to be assessed;

• classify and/or group performance criteria into common areas;

• produce a three dimensional table of specifications which can be converted into a spreadsheet of elements and common performance criteria.

2 EXAMINE THE AVAILABLE ASSESSMENT METHODS

• ascertain which methods are most capable of assessing competence in a holistic manner..

• relate the different forms and methods of assessment to a spreadsheet of units, elements and performance criteria.

3 SELECT THE METHODS

• weigh the various assessment issues e.g. content validity, acceptability to community, profession and candidates, objectivity in assessment/scoring, reliability of judgement, costs, administration and scoring

4 JUDGE CANDIDATES' PERFORMANCE

• set qualitative rather than numerical standards for performance

• assess the whole integrated performance
• refer to essential elements to choose examples of performance which are characteristic of the level of competence

• refer to performance criteria to specify the properties that characterise performance as competent

• determine the number of competent performances required to establish consistent performance

• judge whether an individual has satisfied a criterion or standard of performance

• decide if strengths in one area compensate for weaknesses in another area

• interpret ratings with respect to a particular element and do not add or average them across elements

5 MANAGE AND EVALUATE THE ASSESSMENT PROCESS

• strengthen relationships between professional bodies and educational providers

• undertake widespread consultation with members of the profession to explain the nature of competency-based assessment

• develop a training program for assessors

• develop handbooks for assessors and candidates

• select assessors (and develop a register if considered necessary)

• develop a system for recording judgements of performance or decide on systems already developed

• develop a mechanism to give feedback to candidates

• consider a review mechanism

• develop a plan for assessing prior learning
• with educational providers develop a project to evaluate methods in use

• design a project which can trial/test new assessment methods and ways performance is judged
APPENDIX A

MEDICINE

Traditional ways of assessing medicine in the US

In the 1970s in the United States, a considerable body of research pointed to the fact that newly graduated doctors demonstrated an unacceptably high level of errors in patient diagnosis. The major reason advanced for these findings was insufficient concentration on the development and assessment of clinical reasoning.

In that decade, a debate about the nature of clinical competence ensued, with the result that competence was defined by the major medical boards in the USA including the National Board of Medical Examiners (the national body which registers medical practitioners). While the elements of clinical competence were identified, the research reports that there was difficulty establishing standards due to a lack of agreement about interpretation of data, patient diagnosis and management.

Traditional assessment in medicine consisted largely of written and oral examinations of knowledge, (including multiple choice questionnaires) simulations, subjective ratings by peers and academics, and chart reviews. Much of the scoring was done on the basis of a relative standard rather on an absolute standard, i.e. norm-referenced rather than criterion-referenced. While some of these techniques were found to yield consistent results, they had little ability to predict whether graduating doctors would be able to perform competently in clinical situations.

Ways in which performance is assessed

In the past two decades, there have been many attempts to evaluate the competence of medical graduates. Since the early 1970s, the American Board of Internal Medicine has required that residents' clinical skills in history taking, physical examination, record keeping, patient management, doctor-patient relations, and overall clinical competence, are verified before they can attempt the written examination leading to certification.

Some of the techniques which have been used since that time to assess clinical competence, include fully observed patient encounters, subjective observation and evaluation by senior practitioners, chart audits, multiple choice...
questionnaires, written simulations of patient encounters, oral examination, videotaped clinical performance, and the use of simulated patients (in various forms).

What has become apparent since the early 1970s, is that clinical competence is a complex phenomenon, which almost always requires the practitioner to use a combination of attributes simultaneously. In addition, practitioners need to adapt their practices to different contexts. Thus, it is not surprising that no one assessment technique has been found which can evaluate overall clinical competence. Consequently, the use of combinations of techniques has increasingly become the norm.

There has been a considerable amount of testing of which techniques (and which combinations) are the most reliable and valid ways of assessing clinical competence. While much research remains to be done, it is fair to say that assessment of competence in some areas of medicine is considerably more advanced than it is in other professions. Other professions may benefit from examining some of these practices and the research on which they are based.

The general state of assessment in Australia

It is difficult to generalise about the nature of assessment in the Australian medical profession. Both the universities and the specialist colleges have autonomy in their curriculum and assessment practices. (Though in the case of the universities they are accredited by the Australian Medical Council). Thus, assessment practices vary widely.

The examples in this section are chosen to illustrate some of the current thinking on assessment practices. It should not be inferred, however, that these are the only examples of effective performance assessment in the professions.

A series of international conferences over the last few years (the Cambridge and Ottowa conferences) have discussed problems and research in assessment of clinical competence in medicine. A number of key issues have emerged. The most important is doubt over whether traditional ways of assessing trainees (written, oral, and observation based formats) are good predictors of clinical competence.

University Assessment

A number of universities now place a greater concentration on clinical competence itself, both in the undergraduate curriculum and in assessment
methods. Some Australian universities have developed problem based curricula or other forms of integrated curricula. For example, at the University of Adelaide there is no precise surgical curriculum for undergraduates. Rather, students are encouraged to work through a series of problems with a surgical flavour.

At the University of New South Wales, over recent years, clinical experiences have been integrated into the curriculum from the first year, expanding in each subsequent year until real problems and patient management are the focus of the fifth and sixth years. This year for the first time, an Objective Structured Clinical Examination, or Assessment, (OSCE or OSCA) will be used to test components of clinical skill in the third year of the program. Such examinations subdivide and standardise the clinical tasks faced by candidates and fix the criteria and scoring system used by assessors. This has recently been trialed at one of the teaching hospitals and has received positive feedback from students and academic staff.

A clinical clerkship, where students are ‘apprenticed’ to a resident doctor, has been a feature of the program for some years. Currently there is in development a rating scale which is designed to help assessors.

The University of Newcastle has in place a problem based curriculum. The curriculum is based on five domains:
1. Professional Skills;
2. Critical Reasoning;
3. Identification Prevention and Management of illness;
4. Population Medicine; and
5. Self Directed Learning.

Each domain is assessed in every year of the program. In year three of the program, for example, the Professional Skills Domain is assessed by using a logbook which includes certifications of specified procedures and observations by two short cases which are limited examinations of a patient of 20 minutes duration followed by a viva: a long case which can be up to 60 minutes with a patient followed by a thirty minute viva/case presentation; and a videotaped interview of a counselling sessions with a simulated patient. In domain 3, Identification Prevention and Management of Illness, there is another combination of assessment methods. Modified essay and short answer questions, short essay questions, a 1-2000 word trauma report, and a ‘chronic disability presentation’, where students present a case to a member of faculty. The
presentation must demonstrate an understanding of medical and social factors impinging on the patient’s situation.

These examples of curricula and assessment strategies demonstrate that there is a considerable amount of time spent developing and assessing clinical performance at undergraduate level. Increasingly, the clinically based standardised patient examination, e.g. OSCE, is becoming an accepted method of assessment in the later years of undergraduate medical courses, and in many of the post graduate colleges. The focus of the assessment is increasingly on the solution of patients’ problems but there is no reason why the same principles cannot be applied to public health and community problems.

Non-University Assessment
An interesting example of the assessment methods used in medicine outside the university sector is the examination and assessment system of the Royal Australian College of General Practitioner’s (RACGP). In developing this system, the College’s first task was to undertake an analysis of the competencies needed of the GP.

How this was done, has been outlined in the NOOSR Research Paper No 1 (Gonczi, Hager and Oliver 1990) so will not be detailed here. However, it is worth reiterating that the analysis identified the knowledge, skills, and attitudes needed by practitioners, the medical areas in which these need to be applied and the problems at which they will be directed. Analysing these more fully, the College has determined that there is a need to assess knowledge, interpretative skills, problem solving, attitudes, interpersonal and communication skills and perceptual skills. But they are not assessed in isolation. Rather, there is a concentration on how these competencies are used in solving a variety of medical problems, in a variety of contexts.

A table of specifications is used to ensure that appropriate weight is given to all clinical areas and the problems encountered in general practice. A judgement is then made as to what weight should be given to each of the attributes identified in the analysis. The RACGP is more concerned with the candidates’ application of knowledge than the ability to recall isolated facts. This has resulted in the weighting below: Knowledge 14%, Interpretive Skills 18%, Problem Solving 34%, Affective Behaviour 26%, and Psychomotor Behaviour 8%.

A selection of methods to test these attributes is made.
The College currently uses 8 methods. These are:

- Two **Case Commentaries**, where candidates outline in writing how they have treated an individual or family through their practice. (A research report is an alternative).
- A three hour **MCQ** of 200 questions taken from an item bank. These are used to test knowledge, interpretative ability, and problem solving skills. It includes 100 simple completion questions with one correct answer, 60 multiple completion/sequential questions—with more than one correct answer, and 40 relationship analysis questions.
- A **Clinical Interpretation Test** where candidates are asked to interpret clinical and sociological data presented in the form of recorded material.
- **CDP(PMP)** (Computer Diagnosed Problems/Patient Management Problems) Computerised case studies of specific medical problems.
- A **Physical Examination** which includes taking a long case, three short cases, a practical procedure and a cardiopulmonary resuscitation.
- A **Diagnostic Interview**, used to examine, amongst other things, communication competencies, 'appropriate’ attitudes, ability to interpret and synthesise various data, and develop and enunciate a plan of management for the problems identified. (**Videotaped consultations** have recently been trialed as an alternative to the Diagnostic Interview.). A **Management Interview** where the candidates are presented with a written case history, allowed 2 minutes to comprehend its contents, and then asked to manage the patient who’s role is played by an examiner. The cases are of two types: those which are life threatening or serious, and those which emotionally laden designed to challenge the integrity and ethics of the candidate. Fifteen minutes are allocated to the interview. The objectives of the interview are similar to the Diagnostic Interview but concentrate more on the management of the case and preventative medicine.
- In the **Practice Assessment**, assessors examine the nature of the candidates’ practice by examining a submitted Practice Profile which contains a log of 100 patients and a number of general topics.

** Likely future developments**

Recent research in the area of cognitive psychology and ‘expertise’ seems to suggest that the capacity to solve clinical problems is not a general attribute applied by the practitioner. Rather, it is related to the capacity to store knowledge and recall it efficiently and effectively in particular contexts. The implications of these findings for assessment have only recently been realised and currently attempts are being made to modify test methods (like MCQs and OSCEs) to take these findings into account. It may be in the post graduate area
that these findings have most importance, but it is likely that they will affect all
levels of all the professions in which diagnosis and problem solving are integral
to competent professional performance.

Another consideration that has begun to be taken into account in the assessment
strategies in medicine, is the impact of testing on student learning. Research has
shown that assessment methods affect the way students learn in medicine. Where
they are expected to recall facts, for example, they will adopt learning strategies
like cramming or rote learning. On the other hand, there is some evidence that
it is possible to devise tests which reward longer term improvement in
knowledge and its use in medical problems.

Research has shown that the content of a test is more important than the type
of test in determining the tests validity (i.e. testing what it sets out to test).
Thus, a MCQ is capable of testing critical thinking if it is well constructed.
Paradoxically, an open ended test can be a bad test of it, if it focuses on recall
of disconnected facts.

Tests of clinical competence (of whatever format) generally have poor
generalisability across test items. That is, a good score on the solution of one
clinical problem will not necessarily translate to good scores on another. The
best way of increasing generalisability, is to increase the number of problems
and thus the length of the test. Statistical analyses have shown that different
formats will take different periods of time to achieve acceptable levels of
reliability. For example, MCQs are able to achieve acceptable levels in about
half the time of OSCE and one quarter the time of PMPs. Thus, decisions will
inevitability need to be made about whether to sacrifice fidelity (i.e. how close
the test is to the real world) since it will be much more time consuming and
expensive and yet no more reliable.

Recently some criticism of the usefulness of examinations like the OSCE has
emerged (Cox 1992). The suggestion is that the aim of the test is inappropriate
where it is used to test the competence of a prospective beginning doctor and
that rather than attempting to test components of clinical competence, as
OSCE does, methods should be devised to test competence more holistically
(this point is discussed in Chapter 3).

(Thanks are due to Dr David Newble of Adelaide University who provided much of the
information for this case study, to Dr Bandranyake of UNSW, Dr Richard D Barry of Newcastle
University Mr Ian Frank of the AMC, and Dr Wes Fabb of the RACGP who provided
information on the College's assessment system.)
APPENDIX B

ACCOUNTANCY

Traditional ways of assessing and the general state of assessment

The accountancy profession is unusual in having two national professional associations, the Institute of Chartered Accountants (the Institute) and the Australian Society of Certified Practising Accountants (ASCPA). These two associations have recently joined with the New Zealand professional association to develop a set of competency standards for all professional accountants in the two countries.

Assessment in the profession is carried out both by the associations, and the universities. Unlike many other professions, membership of the associations is gained only after an extensive program of training and assessment.

University Assessment

Over recent years, the accounting associations have encouraged the universities to revamp their courses and this has played a part in the decision of some universities to introduce a practicum or co-operative year, where students gain experience in industry. This has been the case at the Royal Melbourne Institute of Technology, Monash University, University of New South Wales and University of Technology, Sydney. Inevitably this has meant a wider range of assessment practices being implemented. Nevertheless this co-operative program is proportionately small. At the UNSW, for example, some 15 students out of 1000 were enrolled in this program in 1992.

In addition to the co-operative program, however, most universities have introduced assessment methods which do test professional skills through performance as well as their traditional assessment of disciplinary knowledge. Typically in any year of a course there will be a series of practical sets where students are required to, say, construct a computer model which is a simulation of a real accounting problem, or to keep a number of journals and ledgers. In addition, case studies are widely used where the students are put into the situation of the practising professional and where their competence in problem framing and solving are assessed. It is now widely (though not universally) recognised in accounting courses that accounting is concerned with the capacity to think creatively and to research effectively and both teaching and assessment methods tend to reflect this.
Non-University Assessment

The Institute of Chartered Accountants runs its own post graduate program (Professional Year Program [PY]) designed to prepare graduates for a career in chartered accountancy. It aims to extend accountants' knowledge and integrate academic knowledge with practical experience on the job. Candidates enter the PY after completion of an approved degree in economics, business, or commerce, with a major in accountancy, and undertake a period of compulsory supervised practice. Examinations are attempted by candidates at least two years after graduation.

Candidates study five modules, four which deal with technical issues such as accounting and taxation, and one which deals with ethics. These areas are assessed through an examination, and participation in and presentation at, a workshop. The latter is worth 15% of the total marks, 5% of which is awarded for a presentation which tests the capacity to communicate effectively on technical matters with other members of the profession and with clients. A further 10% is awarded for participation in discussion at the workshop which demonstrates the candidate’s knowledge of the topics under consideration. Two group leaders, who are senior members of the profession, mark both elements of the workshop (candidates also appraise the group leaders and the results are used to train and select future leaders).

An examination of technical material, consisting of multiple choice and written questions, is the main assessment instrument. This is an open book exam where candidates are encouraged to apply knowledge rather than merely recall facts. Questions are largely simulations of real situations faced by accountants. However, as the Institute’s Education Handbook points out, there will be insufficient time to use books unless they have been previously studied by candidates. These exams are marked by a panel which is provided with marking guides and suggested answers as well as a sample of candidates’ answers which are discussed prior to commencement of marking. Through the marking period, papers are audited to ensure consistency of marking. After the totalling of all marks, borderline candidates’ examinations are independently remarked.

The professional licensure examination of the ASCPA is based on a multiple choice format which tests material presented in technical modules studied in a distance mode.

Effort has been made to ensure the reliability and validity of the examination. In 1991, for example, an analysis of the Auditing course was undertaken in terms of the knowledge skills and values which the education program sought to
develop. Twenty content areas were identified. The main content areas were then linked to three levels of cognitive functioning: recall of facts, comprehension, and interpretation of information and applying theory to solve practical problems. Thus a blueprint of 60 cells was developed which it has been argued can only be assessed using an MCQ format given the constraints of time.

It should be pointed out, that there is evidence from a variety of professions that an MCQ can be used to assess higher level capacities such as the capacity to synthesise and organise ideas. Examples of MCQ questions developed by the American Society of Accountants to test complex combinations of competencies are currently providing suggestions for ASCPA question writers.

Because of the large number of candidates sitting for the exam each year, and the lack of time, the ASCPA has decided that the most satisfactory way to ensure that the marking is reliable is through an MCQ. The alternative of an essay exam would require multiple raters and other techniques which are not considered feasible given the constraints of time and money.

Assessment of performance and innovative assessment

The nature of accountancy is such that performance is often less visible than in some other professions. While it is true that accountants need to interact and communicate with clients and other professionals, much of the work is concerned with planning, researching, analysing, and writing reports in a relatively solitary fashion. Thus, much of the performance that needs to be assessed may be difficult to observe. For this reason it could be argued that the examinations of the two professional associations are testing performance to some degree. That is, some accountants spend a good deal of their time working through problems contained in sets of accounts.

A number of universities have recently attempted to assess the co-operative education component of various degrees. A good example of this is the assessment undertaken at the RMIT. Here students can undertake twelve month industrial experience which is assessed in two ways: through a report organised by the employer and assessed by the Faculty and an evaluation by the Industrial tutor.

From 1993, tutors will be given a rating scale to help them evaluate the performance of the student in a number of areas: Technical, which looks among other things, at knowledge of the industry, problem solving, and
application of theoretical concepts to practical problems; Organisational, which looks at ability to plan, attention to detail, and ability to meet deadlines; Communication, which includes clarity of written communications, ability to work with associates, and effectiveness of oral communication; and Attitudes, which looks at, amongst other things, initiative, willingness to accept responsibility, and ability to follow instructions.

The scale contained in a form which asks tutors to rate students on a scale of 1 to 5 on each component and make an overall judgement on strengths and weaknesses.

The difficulty with forms of this type is establishing clear criteria on which to base a judgement. Without clearly defined criteria the assessment will not be particularly reliable. However, if the description of the area to be rated was supplemented by the sort of criteria typical in competency standards, the reliability could be expected to improve markedly.

**Likely future developments**

The development of competency standards in accountancy undoubtedly has the potential to inform all of the assessment methods currently used in the profession. The careful articulation of the competencies of the profession will assist the development of examinations, whether these are an MCQ or essay format. Rather than relying on the content of syllabi as the main criterion for determining validity, examiners can base their questions on the real tasks and attributes identified in the competency standards. It is likely that the standards will point to areas that have not been traditionally assessed in the profession and to new methods for assessing whether candidates are competent to practice.

In addition, competency standards will potentially increase the reliability of assessment of performance. In the case of the RMIT rating scale mentioned above, tutors will have a common, clearly articulated standard against which students can be rated. Thus, the variability between raters should be reduced and reliability increased.

(Thanks are due to Jean Robertson of the Institute of Chartered Accountants, Anne Johns of the ASCPA, Professor Bill Birkett of UNSW and Helen Sanderson of the RMIT for the information they provided.)
APPENDIX C

NURSING

Before detailing this case study it is necessary to explain two acronyms.

1. ANRAC - Australasian Nurse Registering Authorities Conference
   (A biennial conference held for delegates from all States/Territory registering authorities).

2. NCAP - ‘Nursing Competencies Assessment Project’
   (The Researchers’ term for the research project).

In 1986 ANRAC expressed a concern about the variations in requirements for registration and enrolment between the Australian Nurse Registering Authorities. The difficulties for migrant nurses wishing to register or enrol also presented a problem.

The conference determined that there was a need to identify nationally agreed minimum competencies for registered and enrolled nurses. ANRAC’s decision about competency development predated by three years the Commonwealth Government’s decision to assist and encourage professions to develop national competency standards and competency based assessment. The Registering Authorities’ objectives were based more on mutual recognition principles.

Issues paramount to the nursing context at the time were:
- the shift in the site of education for nurses from the hospital to higher education institutions;
- the redefinition of the relationship between registered and enrolled nurses;
- the national effort to demarcate the role of the enrolled nurse;
- the variety within and among States in the length of training for the enrolled nurse;
- the attachment of the Nurse Registering Authorities in each State and Territory to their particular procedures and standards that have been independently derived over many years;
- the desire of sections of the nursing profession to move towards a single national register of nurses in order to assist in greater use of the nursing workforce that is highly mobile throughout Australia and overseas; and
- the national recognition of overseas nurses.

At this stage in the process it was clear that the ANRAC competencies could be utilised for four purposes:
• to determine the eligibility for initial registration or enrolment of nurses prepared in Australia;
• to determine the eligibility of nurses prepared overseas for registration or enrolment in Australia;
• to provide the basis for assessing nurses wishing to re-enter the workforce after a period of absence; and
• to assess qualified nurses who are required to demonstrate a minimum level of competence for purposes of ongoing practice.

The registering authorities considered that there needed to be a move away from assessment of paper qualifications and knowledge, to assessment of performance.

The ANRAC competencies were initially derived by experts from their own holistic knowledge and experience, but were confirmed by an empirical study.

The agreed goals of the research project were:
• the validation of the competencies for registered and enrolled nurses; and
• the development of an assessment technology.

These two goals determined the processes of the research undertaken by the NCAP team. These aspects, which were intimately intertwined, were kept central at all times.

The research methodology involved in the validation is described in detail in the ANRAC Nursing Competencies Assessment Project, Volume 1 (ANRAC 1990). The research methodology consisted of:
• literature review;
• observational studies; and
• analysis of assessment instruments.

The latter two allowed the development of validated lists of competencies and added greatly to the assessment technology (ANRAC Nursing Competencies Assessment Project 1990 Vol 1).

There were four stages in the ANRAC project:
1. Development of competencies (policy making).
2. Validation of the competencies and development of assessment technology (Research & Development).
3. Implementation of the competencies:
   • promotion of the competencies;
   • preparation of an issues document;
   • conduct of national seminars;
   • professional development/assessor training; and
   • development of an assessment kit.

4. Ongoing review and evaluation.

The validation process involved the training of observers to assess the performance of new graduates. They observed the nurses' personal attributes, including specialised knowledge, cognitive skills, technical skills, interpersonal skills, traits (such as personal energy levels and certain personality types) and, finally, attitudes that elicit desired behaviour patterns.

The domains which NCAP believed to be most appropriate for the ANRAC competencies for registered nurses are:
   • Professional/Ethical Practice;
   • Reflective Practice;
   • Enabling;
   • Problem Framing and Solving; and
   • Teamwork.

**Development of Assessment Technology**

The second research goal was to develop assessment technology. The NCAP assessment technology is provided in Volume 2 of the project report.

The ANRAC competencies set the scope of practice expected of the beginning registered or enrolled nurse. The NCAP technology guides professionals in the use of tacit knowledge about standards in the process of judging competence in relation to the competencies. The technology is not an assessment instrument, but may be used as a guide in the development of such a tool. *The development of assessment methods and recording techniques is being undertaken now, with the training of assessors.*

The ANRAC work predated the Australian Standards Format as described in the NOOSR Guide to Development of Competency Standards for Professions, and therefore the terminology used by NCAP is different.
The NCAP assessment technology included:
• Sources of Evidence;
• Verbal Descriptions of Standards; and
• Cues.

a. Sources of evidence
'Sources of evidence' for each competency may include:
• observation (direct and indirect);
• audit of documents (such as care plans) used by the candidate;
• interviews of candidates, which allow assessment of motives and attitudes;
• interviews with individuals/groups and colleagues and clients which permits evidence to be collected about outcomes of interventions;
• testing using the traditional paper and pencil assignments, projects or examinations, oral examination or case presentations; and
• records of academic achievement and participation in ongoing education or other professional activities may be useful in assessing competencies.

b. Verbal description of standards
Verbal descriptions of standards are statements setting down the properties that characterise something of the expected standard of performance.

c. Cues
Cues are selected concrete examples of activities illustrative of the competency. The notion of using professional judgement of nurse assessors requires rigour and should be supported by evidence.

The assessment of the ANRAC competencies cannot be achieved by using a checklist, but relies on tacit knowledge, verbal descriptions, and performance criteria. Expert and trained assessors use their tacit knowledge together with assessment guides to achieve a global assessment. This process is much the same as the process of assessment of a fine wine, literature, music, or art. Tacit knowledge enables the expert to judge quality.

Further research is needed to expand the cues and verbal descriptions of the level of competence. This will be achieved during the training of assessors and will result in the refinement of the assessment technology.
Assessor Training/Professional Development Workshops

One of the recommendations arising from the original research project was that professional development programs be conducted for registered nurses to assist them to value their tacit knowledge of nursing, to understand how this tacit knowledge can be used in assessment (NCAP, Vol. 2, 1990:4) and to develop skills in competency-based assessment. The assessment processes recommended as a result of the research project were significantly different to those previously used.

The pivotal role of the assessment process within the context of nursing practice has been re-examined by the ANRAC research. During the validation of the competencies the researchers found that there was widespread dissatisfaction with the professional assessment procedures. There are widely accepted reasons for this dissatisfaction.

- Firstly, the traditional assessment procedures usually sampled a very narrow range of practice situations.
- Secondly, the currently used assessment procedures were biased towards the assessment of knowledge rather than performance.
- Thirdly, assessment of performance often relied on indirect, vicarious, and unstructured methods.
- Lastly, virtually no attention was given to the assessment of the personal traits or attitudes of those being assessed for registration.

Furthermore, assessment instruments received and examined by the NCAP team generally did not include guidelines for their use. People were not trained to use them. There was little evidence of work having been done to establish validity or reliability.

At that time, the assessment of nurses for registration was in a state of flux. The various methods of assessment procedures allowed only a narrow range of practice situations to be assessed. They did not effectively examine the entire demands of the nurse’s role.

Assessment procedures in academic settings are biased towards assessment of knowledge rather than performance. In the past performance assessment looked at the practical skills i.e. the ability to carry out a procedure. Personal traits or attitudes of those being assessed were virtually overlooked. Checklists were the mainstay of most assessments.
Assessment instruments available were:

- multiple choice question tests to measure retention of relevant knowledge;
- multiple choice question tests to measure cognitive skills and knowledge of technical and interpersonal skills;
- problem solving exercises to measure skills; and
- observational checklists of skills in the practice settings.

The clinical area involves many factors associated with the context that can cause the student to behave in a certain manner including factors such as the setting or relationship with the client. The assessor has the task of using their professional judgement in deciding the competence of the individual and must take the context into account. There is considerable complexity in the assessment of clinical competence which ‘must be carried out in the context of the nurse–client encounter’ and which involves the exercising of judgement on the part of the expert nurse assessor. It cannot be assessed by any single procedure, as it relies on a 3-way relationship as shown below:

```
\begin{center}
\begin{tikzpicture}
\node (client) at (0,0) {CLIENT};
\node (nurse) at (0,-2) {NURSE};
\node (environment) at (0,-4) {ENVIRONMENT};
\path[->] (client) edge (environment);
\path[<->] (nurse) edge (client);
\path[<->] (nurse) edge (environment);
\end{tikzpicture}
\end{center}
```

The role of assessment for nursing practice is to make an inference about the individual's performance including their knowledge, attitudes and skills. Inferences should always be checked in order to give validity and rigour to the assessment process. Professional judgement involves the use of critical indicators which support a decision that a nurse is competent in a particular competency or competencies.

**Assessor Training**

The registering authorities recognise that the training of assessors is pivotal to the success of any competency project. It is meaningless to develop a set of competencies without ensuring their implementation. The training of assessors within the higher education setting and the clinical areas has the potential to shift the levels of professionalism of the nursing workforce. Assessor training
involves reflective practice by the expert assessor and assists the development of expert role models.

Assessor training and activities have now taken place in all states/territories. To date nationally approximately 500 people have gone through assessor training workshops. It is envisaged that these programs will be on going, and they will contribute to the refinement of the competencies and the development of cues for advanced areas of practice, and specialty area.

Originally, the assessor training consisted of 3 x 2 day workshops. The format has since been refined although the original aims have been maintained.

**Aim of the Workshops**

1. **Professional development of nurses**
   - Dissemination of what is known currently about competencies in the professions
   - Providing the nursing profession with opportunities to build upon and develop what is known about competencies in the profession
   - Opening up the debate and identifying issues about competencies in the nursing profession.

2. **Pooling of knowledge about assessment for entry to practice in various contexts:**
   - Identify and refine performance criteria and standards, cues, indicators, exemplars, and standards;
   - Develop networks between nurses involved in assessment using competencies.

3. **Identification of what is required to be a good assessor of nursing practice.**
   - Develop skills in the use of the ANRAC competencies as an assessment framework.

Assessment within the competency standards framework promotes recognition of the complexity of professional practice and the subsequent value of professional judgement in the assessment process.

The act of assessment for professional competence involves the making of an inference about the individual’s performance including knowledge, attitudes, and practice. A legal paradigm involving weighing evidence is more appropriate to assessing nurses than a scientific paradigm entailing measurement.
Professional judgement requires:
• use of critical indicators;
• rigour; and
• supporting evidence.
This should be a public process in order to maintain credibility.

As stated already assessment of performance in the workplace requires recognition of the context within which performance is to be evaluated. In nursing, the practice setting involves many factors associated with the context, e.g. clinical setting, time, specific client.

The assessor has the extremely complicated task of deciphering the level of competence of the person being assessed (Vol. 1, p. 37) Therefore ‘the assessor’s tacit knowledge and inner discipline are the most crucial to the validity of the whole assessment process’ (Vol. 1, p. 38).

One of the recommendations of the NCAP team was to develop assessment tools as part of the professional development workshops. To many this has been interpreted as meaning a form will be developed for use in assessment techniques such as observation and interview. Project officers employed by the Nurse Registering Authorities believe that this would impede the desired outcomes of the workshops. Such a tool could have the effect of reducing the emphasis on the value of the assessor’s tacit knowledge of nursing. The concern here is a tendency for assessors to ‘revert to the familiar’ and develop tools/checklists which are more consistent with a quantitative (objectives based) assessment and which discourage the use of professional judgement.

There is no avoiding the fact that any assessment reflects the standards of the assessor. These standards are subjective in the sense that they are possessed by the person who is the assessor. Consequently the standards of the individual assessor are always subjective in the sense that they are learned and relative. This opens up the possibility of the standards being shared and brought into some relationship of uniformity with the subjective standards of other assessors of equal knowledge and experience. This process of sharing and truth testing (in practice) the standards of skilled expert professional assessors, ensures a just and objective process of assessment.

A variety of assessment approaches enables the offsetting of bias. For any particular process, training of assessors is essential to ensure sufficient understanding of the technique to enable its proper use. Training also prevents past experience from adversely affecting the use of the newly learned process.
During the assessor training workshops participants are encouraged to value their tacit knowledge of nursing, improve their assessment skills, in particular in the technique of observation, and gain an understanding of the advantages of competency–based assessment.

The nurse assessor is the 'assessment tool'. The only 'tools' required by the nurse assessor is a method of data recording appropriate to the assessment method, e.g. pen and paper for observation, and reference to the competency standards when analysing the assessment data (Thompson, 1992).

The assessor skill development involves learning exercises to develop valid and reliable professional judgements. These include:

• effects on contexts of assessment;
• self understanding: effects of ‘perspective’ and past history/experience on professional judgement;
• where/when to gather evidence;
• skills in gathering evidence in naturalistic settings;
• skills in analysis and interpretation of evidence;
• scope and level of practice to be assessed (identifying standards); and
• sharing standards and developing cues.

Assessment processes are supported by tacit knowledge, verbal descriptions of standards and cues. Tacit knowledge allows the assessors to use professional judgement. Professional judgement involves the application of knowledge and assessment of critical indicators which deem a nurse competent.

The assessment process consists of:

• self–assessment by the nurse;
• observations by the assessor;
• interviews by the assessor with the nurse and appropriate others;
• analysis by the assessor of all relevant documentation.

Multiple sources of evidence increase the accuracy of judgements in assessing readiness to practice.

To assist with the training of assessors an assessment kit has been developed and will be available shortly.

The kit aims to facilitate assessors to make the conceptual shift in assessment approaches towards a global perspective. The kit is functionally divided into four learning components.
Digest

The digest presents an overview of the historical events in the development of the ANRAC competencies. It presents some of the key definitions of the research approach and most importantly, the assessment technology.

Domains Booklet

The ANRAC National Competencies for Registered and Enrolled Nurses have been categorised into Domains. They are intended to assist assessors in conceptualising and assessing of the Competencies.

Workbook 1

A self-directed series of readings and activities which guides the nurse towards a beginning understanding of the ANRAC competencies as an assessment framework. This will further enhance and acknowledge the professional development of nurses. It will enable nurses to differentiate between competencies and skills and identify why competency standards are valuable. An audio tape enables assessors to reflect upon other participants beliefs.

Workbook 2

This workbook identifies one of the many methods used to assess competence. This workbook and related audiovisual material will assist assessors to make valid and reliable professional judgements about the nurse’s competence, by providing a series of exercises and programmed feedback regarding the assessor’s professional judgements.

The video tape has been designed to provide observational exercises which are deemed crucial to developing an understanding of the relevance and validity of professional judgement to the assessment of competence using a competency-based model.

The nurse registering authorities do not see the competencies as being prescriptive for the development of nursing curricula, but rather as a framework to guide the development of curricula, or be seen as a set of goal statements for any nurse education program.

(Thanks are due to Elizabeth Percival, Di Lawson and Marlene Anderson from the Nurses Board of South Australia, Maureen Thompson from the Nurses Board of QLD and to Professor Judy Lumby and Jane Stein Parbury from the UTS Faculty of Nursing)
Regulation of the profession

The Australian veterinary profession is regulated by legislation. Veterinarians must be registered (certified) to practise in accordance with the relevant legislation of each of the states or territories in which they work. Registration is overseen by Boards of Veterinary Surgeons constituted under the relevant statutes of each jurisdiction.

A system for national registration of veterinarians does not exist in Australia, although mechanisms for registration in more than one jurisdiction are being facilitated and the possibility of national registration is being investigated by the various boards. Proposed changes to the legislative arrangements between the States and the Commonwealth in relation to mutual recognition could have an impact on this process. Regulation of the professions, like many other processes, is affected by the relative powers of the States and Commonwealth.

Requirements for registration

Despite some minor differences in the requirements for registration in each jurisdiction, the basic minimum standard of professional competence required for registration at the entry level of the profession is the same in all States and Territories. Thus, for practical purposes the standard of competence required is consistent nationally, even though there is not a national registration mechanism.

There are two usual avenues to registration at the entry level of the profession, both of which are accepted by all boards. One option is to possess a veterinary degree from an Australian University or from one of a limited number of overseas universities whose degrees are acceptable to the boards. The other mechanism, which is aimed at overseas graduates whose degrees are not acceptable to the boards, is based on satisfactory completion of the National Veterinary Examination (NVE). Candidates for the NVE must hold a veterinary qualification which would entitle them to practise as a veterinarian in the country in which their qualification was awarded. The NVE is supervised by the Panel in Veterinary Science of the National Office of Overseas Skills...
Recognition (NOOSR), with the assistance of a board of examiners which overseas the conduct of the examination and has a major role in determining its content.

Assessment for registration

As indicated above, the registration authorities do not actually conduct the assessments leading to registration—nor does the profession. Assessment for registration is either incorporated in undergraduate veterinary education or the NVE. These are the areas where adoption of competency-based assessment would be expected to have an impact.

Australian veterinary degrees are registrable qualifications. This differs from the arrangement in the USA, for example, where there are separate national registration examinations and, in some states, State Board examinations as well. There is also no formal obligatory period of internship, or the like, following graduation in veterinary science in Australia (as is generally true internationally), in which experience is gained in the workplace under supervision. Workplace experience is normally gained by Australian undergraduates in university teaching practices, and in private practices, government and industry, by arrangement with the veterinary faculties. Members of the profession are major contributors to this aspect of veterinary training.

The requirements of a registrable qualification place special responsibilities on veterinary faculties to provide comprehensive training relevant to the professional workplace—more so than in some other professionally orientated faculties where a period of structured postgraduate experience must be completed for full registration. As a result there has traditionally been a strong interest in practical training and an awareness of the importance of assessment of practical performance in veterinary education. Competency standards for the profession have an obvious link with this process.

Methods of assessment in undergraduate education

The instruments employed for assessment in veterinary education are mostly traditional. They include written examination in a variety of formats, practical examinations, assessment of performance in practical classes, assessment of clinical work in veterinary teaching practices in the later years of the course and some oral examinations. Practitioners with whom students see
practice/industry may assist with assessment as well, sometimes focussing on less tangible attributes in the affective domain.

Despite the variety of other instruments employed, the written examination of knowledge probably predominates in most courses/subjects. Whatever the type of assessment used, it is generally applied within individual subjects. Assessment across disciplines is rare. Both progressive assessment and final assessment are employed, the final assessment generally having greater weight. Professional judgement has a significant role in assessment of clinical performance. As is generally true of higher education, the level of training of assessors in the use of the assessment techniques they employ will vary.

There is increasing interest in interdisciplinary teaching in Australia and overseas—especially in problem-based learning. This may have an impact on methods of assessment. Self instruction/assessment is also being employed to a limited extent, as is computer-based assessment. The advent of competency standards could be expected to have an impact on these developments as well as the more traditional forms of assessment.

Assessment in the National Veterinary Examination (NVE)

The mechanism of assessment for the NVE involves a test of occupational English, a written examination of knowledge and, finally, a clinically orientated practical examination conducted in one of the veterinary faculties. The first two components of the NVE must be satisfied before the clinical examination is taken.

The second stage of the examination relies heavily on multiple choice questions. The question bank is extensive. The content, validity and reliability of individual questions is reviewed regularly, including trials with graduates and final year students. The clinical examination includes oral examinations and assessment of practical performance in simulated workplaces (a teaching practice of one of the universities). The clinical component of the NVE shares some similarities with the examinations usually undertaken by Australian undergraduates in the later stages of their course.

Specialist registration

Veterinarians at the entry level of the profession in Australia are expected to be generalists. 'Specialist' registration is not available at entry level. This approach is supported by the boards, faculties and the profession. It is widely believed to
be in the best interests of the Australian community, where most veterinarians are typically called on to deal with a very broad range of work roles at the entry level of the profession. Continuing education programs aimed at specialist registration for experienced practitioners are offered by the Australian College of Veterinary Scientists. Other mechanisms for certification of special interests are also being explored by the profession.

**Competency standards**

Competency standards have been developed for the entry level of the veterinary profession and were endorsed recently by major parties in the profession as a working draft, subject to any revisions arising during the development of an assessment process based on the standards. The standards describe what is done in the workplace at the entry level of the profession (Units and Elements of Competency) and the standard of performance required (Performance Criteria).

The entry level of the profession has been defined as the aggregate of veterinary activity that would typically be expected to be encountered and dealt with capably by Australian veterinary graduates in a variety of veterinary roles in the first year after graduation. Provision has been made for development of standards at higher levels of the profession in the future.

**Competency standards and the NVE**

The NOOSR Panel in Veterinary Science has adopted the standards as a basis for revision of the National Veterinary Examination. A project to develop an assessment procedure based on the standards is about to commence. Several challenges lie ahead.

**Challenges**

a. **Scope of Entry Level Competence:**
One of the major difficulties in development of the standards, which has an impact on assessment, has been in dealing with the broad scope of work encountered at the entry level of the profession. The entry level of the profession typically encounters a wide range of situations, not all of which can be expected to be able to be dealt with adequately by entry level veterinarians. On the other hand, there is a range of common circumstances in which practised facility can reasonably be expected of entry level veterinarians. A
major difficulty arose in definition of those circumstances. While there was widespread recognition of their existence, they had not been defined previously.

The standards now deal with the scope of the entry level in four ways;

i. recognition of a set of analytical abilities expected of all veterinarians to determine the nature of veterinary input required in any situation in which their professional advice is sought, whether or not they are actually able to deliver personally the veterinary service required;

ii. definition, by way of range indicators, of specific ‘common’ circumstances in which a capacity for competent independent performance is expected for registration at entry level;

iii. recognition of adaptability and transferability as essential elements of professional competency to deal with the host of other (‘uncommon’) unspecified circumstances likely to be encountered at entry level; and

iv. recognition of elements of professional competency associated with collaboration and referral, when involvement of other veterinarians is desirable or necessary to cater for circumstances beyond the independent capacities of entry level veterinarians.

A major benefit of this approach is that the scope of common circumstances has now been defined clearly for candidates and assessors by way of range indicators. This will facilitate selection of the specific content of assessment processes and preparation for assessment by candidates who are not familiar with the Australian context. There is now a need to review the content of existing questions and, possibly, to develop new questions.

Recognition of the other aspects of competence related to analysis, adaptability, and collaboration are also important advances in definition of the competence required in the workplace. To develop adequate means to assess these components of competency represents a significant challenge.

The competency standards also identify a number of other aspects of professional competency in veterinary science that have not been emphasised strongly in the NVE in the past. These include management of veterinary activities, planning veterinary interventions, professional interactions with clients and colleagues, and preparedness for continuing professional education. It has been agreed that all units of competency should be assessed. There remains a need to determine the extent to which they should be assessed and to develop appropriate instruments.
b. Cost-effective Assessment:
Another challenge is in maintaining a cost-effective and efficient assessment while addressing the full range of competencies of the workplace. This is linked to a desire to develop an integrated assessment system which is aimed at a holistic view of competence. It is hoped to develop assessment mechanisms that embrace groups of competencies, which will be both efficient and effective.

c. Training of Assessors:
A related challenge is to train assessors to implement the new instruments. This may be easier than in some circumstances because there is a relatively large pool of experienced examiners of practical performance available from veterinary faculties. That is not to say that training for competency-based assessment will be unnecessary.

**Competency standards and veterinary education**

The standards so far developed highlight the importance of many aspects of professional performance that have not necessarily been emphasised in undergraduate curricula. It is to be hoped that the advent of the standards will stimulate further discussion of the importance of these aspects of professional performance among academics and lead to clarification of the ways in which these competencies are being developed in veterinary education and the extent to which they ought to be assessed. The standards provide a basis for further cooperation between the profession and the universities in this respect.

Another area to be explored is the extent to which veterinary education might become more competency orientated. As indicated above, a significant component of veterinary education is already performance orientated, as is assessment in many academic disciplines. However, as discussed above, a framework of established academic disciplines does not necessarily embrace many important aspects of professional practice.

In terms of competency-based assessment, it is desirable to aim for holistic assessment of aggregate competency. This is not necessarily achieved by assessment within disciplines, the predominant approach in veterinary education. To gain the maximum benefits of the advent of competency standards, veterinary educators might consider the role of assessment of the aggregate abilities of prospective graduates in addition to the traditional discipline-based assessment that predominates at present.
The need for formative assessment will continue in education, but the role of summative assessment needs to be considered and appropriate emphasis given to it. Equally, the role and benefits of multidisciplinary assessment should also be considered. The overall implications of competency-based assessment for the veterinary faculties are that they should build on their strengths in performance-based assessment, but in so doing emphasise competency-based assessment by implementing interdisciplinary assessment, both formative and summative. This may lead to a reduced emphasis on discipline-based assessment.

The competency standards for the profession provide an ideal starting point to consider this proposition. In essence, the competency standards can be seen as educational ‘objectives’, although of an interdisciplinary and aggregate nature. The use of educational objectives in guiding teaching, learning, and assessment, an approach valued highly by many educators within their own disciplines, is on the increase. All that is required is to give appropriate emphasis beyond disciplines to the overall competency to be developed in graduates.

One of the major challenges of veterinary education is to strike an appropriate balance between the emphasis given to specific aspects of performance required in the workplace on graduation, and the more general aspects of veterinary education applicable to a variety of contexts in the longer term. This issue has always troubled veterinary educators and it has become more pressing with the explosion of knowledge. So, too, has the question of general education for life outside the professional workplace.

The competency standards developed for the veterinary profession recognise the breadth of abilities required at the entry level of the profession in Australia. They also identify, by way of range indicators, the aspects of veterinary work in which competent performance is commonly required at the entry level of the profession. This provides a valuable guide to faculties for curricula and, as it does for the NVE, for assessment.

The standards also emphasise adaptability, flexibility and continuing learning. Given the impossibility of keeping abreast of developments solely through didactic instruction, there is a need for increasing emphasis on development of capacities for independent learning. Faculties are moving in this direction and the competency standards provide one means to inform that approach. Developments in competency-based assessment for the NVE will be viewed with interest by veterinary educators.
Admission to the status of architect

In each state and territory of Australia, the government has enacted legislation which controls the use of the label 'architect'. Within the limits of each act, only those who are registered as an ‘architect’ are entitled to use this name. This limitation is not for the protection of architects, but for the protection of the public, who are entitled to expect certain levels of competence from a registered ‘architect’.

To be registered entails being assessed.

The assessment regime for candidates for registration requires, first of all, eligibility. To be eligible candidates must have:

(i) ‘approved academic qualifications’; and

(ii) ‘adequate practical experience’.

After being assessed as eligible for admission by the Board of Architects in each state or territory, candidates may then take the Examination in Architectural Practice (APE).

Thus, on the way to legal recognition as an architect, many layers of assessment of a person’s capabilities from various sources are nested within the final assessment by registering bodies.

Approved academic experience

There are three ways by which academic experience may be established and approved:

A. ‘Satisfactory completion of an approved course at a school of architecture recognised by the Architects Accreditation Council of Australia (AACA)’.

Recognition is achieved by the following assessment process: schools are visited (at their invitation) every five years by a visiting panel consisting of a spread of
architect practitioners and academics, members of AACA, state authorities and the Royal Australian Institute of Architects (RAIA).

The Visiting Panel uses as its Assessment Criteria:

a. The education policy prepared and agreed to by both the RAIA and the AACA.

b. The individual and collective experience of the panel members.

B. 'A pass in a prescribed examination by a state or territorial registration board endorsed by the AACA'.

Most, but not all, Registration Boards have examinations which, backed by the candidate's own architectural work experience, are intended to match, in the appropriate area, the learning and assessment procedures adopted by 'approved courses'. Such examinations accept that, apart from formal training, work experience may be adequate preparation for admission to, and success with, assessment of the architectural performance capabilities of an individual. There is an implied recognition of prior learning which is accepted as eligibility for admission to the prescribed examination.

In practice, the examinations are often written and assessed by architectural educators drawn from 'approved courses'. Consequently, the demands of 'approved course' and a 'prescribed examination' are likely to be similar.

C. 'A statement from the AACA that the overseas qualifications (from a school not already recognised by the Council) of the candidate have been assessed as being equivalent to Australian academic standards'.

Candidates seeking admission under this clause will normally present their formal qualifications, a portfolio of work achieved as a student and (after) attend an interview with an expert panel of Architects. This panel draws its experience from:

a. The individual and collective experience of its members;

b. The Education Policy of the RAIA and AACA.

The architectural practice examination

'The examination in Architectural Practice is a composite examination which compromises four parts: Written Content, Examination 1, Examination 2, Examination 3'.
Written Content: The Written Content (a 45 minute written response to one of a number of topics nominated by the examining board) is used to assess both the capacity to deal with a specific professional problem and to communicate adequately in English.

Examination 1: Adequacy of Practical Experience:

Candidates must submit a log book recording practical experience with information on duration, category of experience and level of responsibility. Experience is required in at least four of the eight categories of experience. A minimum of two years experience must be accumulated (working under the supervision of a registered architect), at least one year after completing an approved course.

Examination 2: Examination by Interview.

'The object of this examination is to test the candidate's knowledge and understanding of the practise of Architecture, including Government, Law, Business Management and Ethics'.

'The examination will take the form of an interview with two examiners and will be approximately thirty minutes duration'.

Examination 3: Examination by Interview.

'The object of this examination is to enable the examiners to make a judgement, based on the candidate's Statement of Practical Experience and Log Book, of the scope and depth of their experience of architectural practice'.

Supplementary Interview:

'In the event of a candidate failing to satisfy the examiners in either Examination 2 or 3, then the candidate will be admitted to a Supplementary Interview.'

'The Supplementary Interview will take the form of an interview of approximately thirty minutes duration conducted by two examiners, neither of whom will have previously examined the candidate at either Examinations 2 or 3.'
Relevant Publications:

PE8 (March 1990) Log Book Experience in Architectural Practice.

All published by AACA, GPO Box 2213, Canberra ACT 2601.

Approved courses in architecture

In Australia, 'approved' courses in architecture, of which there are fifteen, are offered only at universities. All current courses are approved. There is no course which has not sought recognition by the AACA and RAIA. This suggests a universal thrust of course directions towards professionalism.

Courses may well include educational areas which the university finds worthy but are not an essential component of professional education as recognised by the profession's own authoritative bodies - the RAIA and AACA. Certainly there is no restraint upon university architecture courses which would prevent them from including any material which the university wishes.

Within university architecture courses, the subjects assessed have a variety of names, scope, objectives and assessment methods. Generally speaking, subjects fall within one (perhaps more) of the areas which have an emphasis upon design, building technology (construction, structures, services), architectural theory (aesthetics, history), environmental concerns (ecology, sustainability, resource utilisation, urban and regional planning), and social studies (anthropology, sociology, psychology, perception, evaluation). Each of these may have an assessment strategy similar to that which may be utilised in other university faculties whose study areas cover similar fields (albeit with different emphases).

A key characteristic (possibly unique) of architecture courses, is the approach to teaching and assessing design. This is most typically done through projects. A design project is set which stimulates, more or less, the sort of comprehensive and holistic problem situation which architects meet in practice, i.e. from expressed or implied needs a prospect of building is envisaged and the architect explores this in order to resolve whether to build, and if so what to build, and how to arrange the elements of building to satisfy the needs.
Usually there is a graduation of size and complexity of project increasing from first to final years, with each project drawing upon the assumed current state of knowledge and often seeking to extend it. The formulation of design projects can be as intricate as the project itself. Variations from entirely hypothetical and abstract projects to those which almost exactly replicate real projects (except that there is no financial penalty for inadequate completion) may be involved, depending upon the specific learning objectives of the project and the assumed level of knowledge and expertise of the student cohort.

The conclusion of a design project is most likely to be a description, in drawings, models and words of the artefact that is proposed to be constructed.

How are these projects submissions assessed by design staff? Design criteria that are expected to be met may be announced at the beginning of the project, but it is an accepted commonplace that as a design evolves, so may the criteria (which are seldom immutable). The experience of actively designing the project, observed by tutors, may lead to re-assessment of the initial assessment criteria. The allocation of marks to the finally adopted criteria may be as a generalised percentage, or other indicative codes of achievement, or as the sum of accumulated marks achieved for each element of the criteria.

The question of whether an analytical or synoptic marking conclusion is more useful to the student as either a recognition score or a vehicle for further learning (in which case a critique may be made but no final score adduced) is constantly debated by architectural educators.

Also debated is whether the assessment is best made by tutors who have been involved with the students in the design project (and who may consider process and attitude in their assessment), or by a jury of educators and/or practitioners who address only the student’s output, or by some combination of these—even including peer assessment by participating students themselves.

Most schools vary the mix of assessment strategies as there is no single approach which suits every circumstance. What is usual is that if the strategy is sensed by students to be unfair or not useful, their assessment of the strategy will be conveyed directly to the academic staff.
Assessing the assessors

Architectural Practice Examination Assessors.

These assessors have as guidance, the PE2, PE5 and PE8 publications of the AACA. Now although these documents cover the elements of assessment which need to be addressed quite thoroughly, the detailed elaboration is not consistent. Some topics are merely names, some are described as activities, and some are given as instructions which may imply but do not specifically delineate performance criteria or standards of assessment.

It remains part of the examiner's (assessor's) task to interpret, with the co-examiner, the accuracy, scope and level of responses from the candidate being interviewed, and to make fair and reasonable judgements that are consistent with those made by assessors of other candidates.

That this process has not lead to confusion is a tribute to the concern, integrity and experience of the assessors. They are typically experienced practitioners and educators, (or both) with practised skills in assessing employees and/or students.

The assessors confer amongst themselves prior to and after the assessment rounds and in annual conferences in which assessors from all States meet to share and assess their own experience and performance and to consider amendments to the process. It could be, however, that a system based upon competency statements, performance criteria, standards and agreed assessment strategies would be advantageous.

University Assessors

University educators should be expected to be well-versed in assessment strategies and procedures. Some universities have well-established principles and guidelines, and some have their own internal inter-view mechanisms for debating and evaluating current methods and alternatives.

With the formal recognition procedures of the RAIA and the AACA, assessment procedures in architecture courses are not without external scrutiny.

Whether competency-based assessment should be more thoroughly introduced (they are already there in one guise or another) is an issue still under exploration.
The Dietitians’ Association of Australia (DAA) project to develop competency-based standards began in December, 1990, using a task force of 8-9 experienced dietitians, half of whom were coordinating student training at university level. The remaining members were in clinical or community practice, where students are placed for their final 20 week professional practice program. The profession is small—about 1400 members, representing 80% practitioners. The profession was already very committed to the development of professional competency standards, before the project began in 1990. All these factors have been advantageous to the speed with which the project has progressed and the way the task force could focus on philosophical issues so readily.

How did the Taskforce decide what to assess?

Before the task force could decide what to assess, we needed to focus on those units of the competency-based standards for entry level dietitians which were critical to competence in real practice.

The Units were as follows:

<table>
<thead>
<tr>
<th>Foundation Competencies</th>
<th>UNIT 1</th>
<th>UNIT 7</th>
<th>UNIT 8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Underlying knowledge</td>
<td>Scientific approach</td>
<td>Professionalism within organisation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Core Functional Competencies</th>
<th>UNIT 2</th>
<th>UNIT 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interpretation of nutritional information, into lay language</td>
<td>Collection, analysis and assessment of nutrition/health data</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Critical Practice</th>
<th>UNIT 4</th>
<th>UNIT 5</th>
<th>UNIT 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Individual case management</td>
<td>Population nutrition</td>
<td>Influencing food supply</td>
</tr>
</tbody>
</table>

The foundation competencies are not unique to dietetic practice and probably characterise other professional practice. The core functional competencies do describe what is unique about a dietitian—that is, what distinguishes a dietitian.
from other health professionals—and the critical practice describes the areas where the foundation and core functional competencies are applied in the workplace. For the purpose of assessment, we concentrated on describing how to assess what occurs in real life practice in these three areas of critical practice, that is individual case management, population nutrition and influencing the food supply.

We did this by devising seven ‘scenarios’ to reflect real practice. For example, there were two scenarios which described individual case management: one in an inpatient context, which concentrated on developing and implementing a case management plan and the other in an outpatient context, which concentrated on counselling skills, but also included taking a diet history and giving dietary information. Other scenarios dealing with influencing the food supply covered developing a menu for a hospital—which included a range of special diets—as well as checking if food served at a long day care centre was nutritionally adequate for children aged 1-5 years.

The important points about this step in our process were:

a) we referred to real life practice to help us develop assessment activities; and
b) we took a holistic approach by viewing whole units of competence rather than assessing element by element.

How did we know how many of our performance criteria were covered by taking this holistic approach?

We returned to the performance criteria for each unit and did two things. First we expanded the cues into specific assessment criteria for each performance criteria. Secondly, we developed a matrix, which defined the types of client (e.g. adult, infant, child); type of problem, (e.g. clinical condition, nutrition issue); the environment (e.g. hospital, community centre); and the tools used, (e.g. client records, computer data bases, audio-visual facilities). These were plotted against the types of context where these variables may occur—such as clinical, community or food service. We needed this matrix to help define the limits of our assessment activities.

When we began checking how many of the performance criteria were being covered by the ‘scenarios’, it was obvious there was some overlap between units and that some performance criteria/assessment criteria were being missed.
How was this checking or validation mechanism refined?

We returned then to the seven scenarios and expanded them into twelve assessment activities, matching the assessment criteria from each unit against each activity. The twelve specific assessment activities expanded from the scenarios are shown in Table 1, with examples of the type of assessment method that could be used to assess them.

**TABLE 1: TABLE OF ASSESSMENT ACTIVITIES**

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>ASSESSMENT CRITERIA</th>
<th>ASSESSMENT METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Assess 1 week of own intake using appropriate method. Devise record sheets, compare with Recommended Dietary Intakes. Draw conclusions.</td>
<td>2.1,2.2,3.1,3.1,3.3, 3.4, 3.5.</td>
<td>Practical exercise</td>
</tr>
<tr>
<td>2  Hip fracture in elderly women. Discuss nutrition issues &amp; select method. Discuss reliability &amp; validity</td>
<td>2.1,3.3,.3.4,3.5</td>
<td>Written essay, Project</td>
</tr>
<tr>
<td>3  Unconscious adult, fluid restrictions, previously healthy. Assess nutritional requirements. Plan enteral feed, delivery, monitoring. Document. Facilitate enteral feeding. Take 1 hour</td>
<td>2.2,3.3,.3.4,.3.5, 4.2,4.4,4.5,.4.6, 6.1</td>
<td>Pen and paper/ real client/case study</td>
</tr>
<tr>
<td>4  1 hour counselling interview, document meal plan</td>
<td>2.2,3.1,3.3,3.4,3.5, 4.2,4.4,4.5,4.6,8.1</td>
<td>Observe real/ simulated client</td>
</tr>
<tr>
<td>5  Respond to inappropriate referral or referral that does not match client’s needs</td>
<td>2.2,4.1,4.6,6.1</td>
<td>Pen and paper. Real/ simulated client</td>
</tr>
<tr>
<td>6  Develop goals for particular nutrition issues in the community. Develop and documents plan for community nutrition program based on goals</td>
<td>2.1,2.2,2.3,3.1,3.2, 3.3,3.4,.3.5, 5.1,5.2, 5.5, 5.6</td>
<td>Pen and paper/Field activity</td>
</tr>
<tr>
<td>ACTIVITIES</td>
<td>ASSESSMENT CRITERIA</td>
<td>ASSESSMENT METHODS</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>7  Given pre-determined goal and plan for community nutrition program:</td>
<td>5.3,5.4,5.5,5.6,</td>
<td>Some pen and paper/</td>
</tr>
<tr>
<td>a) document and develop group education program for identified target</td>
<td></td>
<td>Observational</td>
</tr>
<tr>
<td>group; b) deliver group education program to group of up to 20 people.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8  Meals on Wheels-poor temperature control. Identify temperature problem &amp;</td>
<td>2.1,2.2,3.1,3.2,3.4</td>
<td>Practical</td>
</tr>
<tr>
<td>key personnel</td>
<td>3.5,5.2,5.2,6.1,6.2</td>
<td>exercise</td>
</tr>
<tr>
<td>9  Hygienic problems at facility, identify critical control points</td>
<td>2.1,2.2,3.3,3.4,</td>
<td>Practical</td>
</tr>
<tr>
<td></td>
<td>3.5,6.1,6.2</td>
<td>exercise</td>
</tr>
<tr>
<td>10 Menu modification for special diets, portion control</td>
<td>2.1,2.2,3.2,3.3,3.5</td>
<td>Pen and paper</td>
</tr>
<tr>
<td></td>
<td>6.1,6.2,6.3</td>
<td></td>
</tr>
<tr>
<td>11 Food and nutrition policy for facility</td>
<td>2.2,6.1,6.2,6.3</td>
<td>Practical exercise/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>observation</td>
</tr>
<tr>
<td>12 Menu evaluation for 100-500 bed facility</td>
<td>2.1,2.2,3.1,3.3,3.4</td>
<td>Pen and paper</td>
</tr>
<tr>
<td></td>
<td>3.5,6.1,6.2,6.3</td>
<td></td>
</tr>
</tbody>
</table>

The assessment activities above are expanded from the original 7 scenarios. The numbers under assessment criteria indicate which criteria and therefore which element in each unit is being assessed. This process took 12 months to complete and involved repeatedly moving back and forth from how practice occurs (and therefore could be assessed) to the performance criteria and assessment criteria, both to refine and validate the assessment activities. The process has also involved making changes in the original elements and performance criteria—mostly simplifying and eliminating undetected duplication.

Prepared by NOOSRIDAA Competency Assessment Project.
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