COMPETENCY BASED EDUCATION AND TRAINING
a world perspective

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COMPETENCY BASED EDUCATION AND TRAINING: A WORLD PERSPECTIVE

Conalep would like to thank the University of Technology, Sydney, (Australia), especially the Faculty of Education, for its collaboration in the edition of this book.
COMPETENCY BASED EDUCATION AND TRAINING: A WORLD PERSPECTIVE

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Colección Reflexión y Análisis
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Eight years have now passed since the first steps were taken to create in Mexico a standardized system of labour competencies, a system for their certification and, correspondingly, competency based education, by means of which it was proposed to address a long-standing social demand to give official recognition to knowledge, abilities and skills acquired outside of formal schooling.

In Mexico, as in many other countries, a great number of young people do not have the opportunity to continue studying within the formal educational system. The rigidity of schedules, and above all of the programmes, does not facilitate the re-entry of adults into an educational process designed, almost exclusively, as a stepping stone to university education. Besides, training courses and other informal programmes were characterized by their dispersion and heterogeneity which did not facilitate their recognition in the workplace and even less so by the education system. All of this has involved inequity at a great social cost.

Once the UNESCO and other researchers in education, particularly those linked to the world of work, pointed out the importance of continuing education and training, a wide-ranging and profound revision of study programmes was begun, as well as of course content and teaching methods more appropriate to delivering, with quality and pertinence, the information required for the so-called knowledge society. In this process it was particularly important to study the problems posed by the reincorporation of young people or adults to learning contexts.

In 1992, as indicated above, the first steps were taken to create a system of competency norms and the mechanisms for certifying them. Studies and a pilot project were also begun to establish the nature and the requirements of competency based education. The first results of both processes were published four years later in the book *Competencia Laboral y Educación Basada en Normas de Competencia* (Labour Competency and Competency Based Education), published jointly by the Secretariat of Public Education (SEP) and the National Council for the Normaliza-
tion of Labour Competencies and Certification (CONOCER) and the editorial Limusa. The book was compiled by Antonio Argüelles, Director General of the National College of Technical Professional Education (CONALEP) one of the institutions involved in the pilot project of this new educational approach.

At the end of the term of President Zedillo's government, who was the promoter of the introduction of the competency system, the Secretariat of Public Education considers it to be of great importance to acknowledge the benefits of the programme and its achievements, as well as obstacles and other problems found along the way.

The inclusion of case studies from other countries with different levels of development and different cultural and educational systems, makes the book especially interesting. The comparative study establishes with clarity the reaches and the inherent limits of competency based education, as well as external problems which influence this educational approach.

This new book Competency based education and training: A world perspective, is very important in view of the rapidity with which Mexico is becoming incorporated into the world economy. This process should be carefully considered by those responsible for educational and training programmes, since these will determine how young people are more easily incorporated into productive life and how those already in the workforce may continue with their formal education and training.

This would seem to be the principal way in which they might achieve more productive employment created by the new stage of Mexican economic development. The intention is to contribute to the increased competitiveness of the country and to raise the standard of living of all Mexicans.

Lic. Miguel Limón Rojas
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Introduction

This book examines the implementation of competency based education in a number of countries. Contained in it are examples of how this new approach to vocational education and training (VET) has been developed (and changed) at a national level but there are also examples of pilot projects within educational systems and examples, too, of implementation in particular industries and specific firms.

The editors felt that there was the need, after some 15 years of international experience with competency based approaches to VET to examine what had emerged and changed since its introduction in the United Kingdom. Since that time competency based approaches have been introduced in Australia, New Zealand South Africa, a number of European countries, and in more recent times in Mexico and in Central America.

It has been accepted by Governments in all continents over the last decade that too little attention has been paid to the education and training of those undertaking middle level occupations at technician and trade level. But it is also the case that in many countries industry has recognised the need to improve the skills and knowledge of all its workers irrespective of level and to do so on a continuing basis. The notion of an unskilled worker is quickly becoming obsolete in particular industries. In the chapter by Gilling and Graham for example, the description of Huntsman chemicals in Australia provides a case study of how operators in a manufacturing plant have been increasingly involved in training as part of a wider change process within that firm. That case study can be generalised to the wider manufacturing industry within Australia and the conclusion drawn that unless all workers are involved in learning, firms and whole industries will quickly become uncompetitive.

The educational framework for addressing the deficiencies of VET has become, in an increasing number of countries, competency based education. This can be defined as education based on outcomes and predetermined standards, on what students can do, as Robinson and Misko argue in their chapter.
All the countries which have introduced competency based education in the last two decades have done so in the recognition that international economic competitiveness has sharpened the need to have a well educated innovative workforce at all occupational levels. Argüelles in his chapter, for example, outlines how the opening up of Mexico to world trade made necessary the reform of vocational technical education in that country. Undoubtedly there are additional social factors in particular countries as Gilling's introduction to the Australian situation points out but the economic imperatives are paramount.

What is still unclear, however, is how well the new VET approach has succeeded in its aims. As Gonczi points out in his chapter the research evidence on the economic impact of competency based education is still quite slight. Robinson and Misko agree summarising both the positive and negative impacts of competency based education. Both chapters conclude, however, that the positive impacts have been substantial even if the expectations of the supporters of competency based education have been unrealistic at times.

There have been a number of problems in the implementation of competency based education in all countries. There has not always been unanimity of purpose between government, industry and the education profession for example. This is clearly detailed in the chapters by Robinson and Misko, Gilling, and Gonczi looking at the Australian example, where the implementation of the system has seen great changes over the decade. A nationally determined system with prescriptive standards has been replaced in Australia by one in which individual firms work within a national framework to develop their own competencies and their own training and assessment regimes.

Argüelles details the difficulties of defining labour competencies in the Mexican pilot project and of gaining the acceptance of these by industry.

As Morales demonstrates in his discussion of the introduction of competency based education in Costa Rica, there is a real need to involve those delivering competency based programs, teachers, in the planning of the reforms. Even when this is done however there is no guarantee of success. Indeed in Australia and the United Kingdom, the delivery of training has been increasingly tendered out beyond the traditional vocational teaching force to industry trainers and private providers.
Undoubtedly the most controversial of the educational issues in the implementation of competency based education has been the assessment and accreditation of competence.

Kirsch, in an interesting study of educational policies in France, points out the inherent difficulties of establishing one frame of reference for technical and academic qualifications.

Early attempts to assess competence in the United Kingdom and Australia relied on excessively behaviourist approaches, where minute specification of elements of competence was seen as a way of overcoming the assessment issue. Mere observation of individuals actually undertaking tasks and recording these on a log was accepted as a valid assessment of a person's competence in a particular occupational area.

Unfortunately this is still the practice amongst many practitioners in many countries.

A number of chapters in this book concentrate on assessment and the overall theme of the contributors is that there is a need for an holistic, judgement-based approach to assessment if it is to validly assess competence. Bowen-Clewely argues that new notions of validity mean that we need to use an assessment system which relies on the collection of evidence and the making of professional judgements based on this evidence, (as occurs in, say, a court of law).

This approach is also supported by Hager who takes a case study from the legal profession to illustrate how assessment can and should concentrate on the action of lawyers (or, generalising from this, to any other occupational group) in making judgements in work contexts. Assessors in turn make judgements about the lawyers' judgements. This approach, he argues, overcomes the tired dichotomy of practice and theory which bedevils much of our educational thinking and assessment theory.

Capper argues that there is a need to consider the workplace context when assessing for competence. Workplace assessors he argues can make reliable and valid judgements in the context of work but that these need not necessarily be related to qualifications. That there might be a serious disjunction between the roles and capacities of workplace assessors (assessing competence in context) versus educators in formal institutions (assessing for admission to qualifications beyond contexts) is an
issue that those implementing competency based education need to consider.

Rademeyer's case study of the mining industry in South Africa provides an interesting example of the relationship between national and firm specific needs. She details the firm specific organisational challenges generated by the introduction of competency based approaches and how these relate to a national system.

Moderation of assessment across contexts is another important issue and it is considered by Bowen-Clewely. She summarises the various approaches and concludes that in industry there is a need for a simple, cost effective system which is context specific, i.e. that suits the culture of the particular industry. Clearly though there is need for further debate about this issue and the more general question of industry approaches versus national approaches to assessment.

Competency based approaches to VET are currently being implemented in a wide range of countries. Clearly there are still unresolved issues both at the level of national implementation- including such things as the extent of national direction, the link between formal VET courses in institutions and industry needs, and at the level of purely educational issues such as the implications for teaching practices and assessment approaches.

There is still much research to be done before we can declare that competency based approaches have fulfilled the expectations of its proponents. However it is clear that there have been many improvements to VET provision as a result of the competency approach, as the chapters in this book illustrate.

We feel that the competency approach provides a framework not only to improve VET but to establish a closer connection between traditional general education and vocational education. The fact that outcomes based approaches are now quite common in general education curriculum is one illustration of this as is the fact that recent OECD publications are stressing the need for a combination of general and vocational education for all.

Our hope is that the integrated approach to competency based education which is argued in these chapters will help to revolutionise approaches to education at all levels- school and university as well as technical college levels.
We believe competency based education will not only play an important part in increasing economic competitiveness but also in breaking down the perceived lack of status of VET qualifications which will have a positive impact on the life chances of individuals who possess them.

Andrew Gonczi/Antonio Argüelles
July 2000
Review of international trends and developments in competency based education and training

Andrew Gonczi

INTRODUCTION

Competency based education and training (CBET) in its most recent manifestation is now over fifteen years old. From the time of its introduction it has been a controversial idea which has divided industry representatives and educationalists alike.

From the beginning, industry and government proponents have suggested that CBET provides a basis for raising levels of skill nationally, for increasing investment in training and for opening up the provision of training to new providers outside the traditional government institutions. Their main argument has been that there is a need to have agreed (national) standards of skill appropriate to industry needs on which to base vocational education/training.

It’s opponents on the other hand, while agreeing on the need to improve the skill levels in the community, have seen CBET as rigid, expensive and difficult to understand, couched as it was in educational jargon and implemented through what some have regarded as labyrinthine bureaucratic structures.

Its educational proponents have seen it as a way of bringing vocational and general education closer together and of ending the lack of understanding amongst most educators about the application of knowledge. The kernel of this approach has been the championing of a conception of competence which brings together knowing and doing into an integrated whole. Its educational opponents on the other hand have

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1 A lengthier version of this article was developed for the international evaluation of the National College of Technical Professional Education and the System of Technological Universities (Mexico) and presented as Annex 6 of the report Learning to work (2000).
attacked its reductionism and behaviourism, its emphasis on disaggregated skills and its failure to acknowledge the complexity of learning and the importance of knowledge in the acquisition of skill.

Amongst educationalists the debate is characterised by excessive claims on both sides. In the real world of the implementation of competency based education the hopes of its proponents have not been entirely fulfilled but equally the denigration of it by its opponents has proved to be wildly exaggerated.

In most of the countries where it forms the basis of the vocational education and training systems—England, Scotland, Australia and New Zealand—CBET is now quite different from its original form. In each of these countries, reviews of its implementation by senior bureaucrats and industry representatives have suggested that it needed to be less prescriptive and less complex. However, many of the reforms arising out of these reviews have yet to be completed. As a consequence, CBET is an evolving concept and practice, an important point often ignored by its critics.

What I attempt to do in this paper is to focus on the current situation of competency based education internationally. I examine research and the scholarly literature from Australia, England, Scotland, New Zealand and to a lesser extent, Germany, the United States and Canada, to ascertain how effective CBET has been and how it is viewed currently by industry and educators. In line with the brief for this paper, there are sections on: educational perspectives when CBET was introduced; strengths and weaknesses of a CBET curriculum; industry focus and the development of appropriate standards; comparisons between CBET trained technicians and those trained by more traditional methods; impact of CBET on economic development and preparation of teachers to implement a CBET system.

In summary, the issues are complex and the research findings are too limited to provide easy answers on the effectiveness of CBET. The impact of CBET on vocational education and training has been enormous—many traditional practices and values have been challenged. Various stakeholders have often had quite different understandings of the nature of CBET and have been interested in different aspects of it. Some are interested in curriculum and pedagogical issues, some in difficulties of implementation from an industry perspective, some in the difficulties faced
by teachers, some on the impact of CBET on equity issues, some on the impact of the CBET on the creation of a market for training and so on. This has meant that the stakeholders have rarely focused on the same issues with the result that the debate is often confused and confusing.

What is clear is that there is still no consensus about the long term benefits of CBET and that much more research would need to be undertaken to be able to provide definitive answers to many of the legitimate questions that are asked about it. However it is very important to note that this is true of almost all educational policy. Rarely has the introduction of major educational policy been based on research findings alone and often policies which are extant and which have been supported by research findings have been modified or terminated.

This says something both about the nature of educational policy—that it is the product of complex social and political forces, and about educational research—that it has not traditionally been focussed on policy issues, and that the accumulation of evidence on which to base policy takes a long time. In effect the time frame for educational policy decisions, based as they are on political cycles, will be almost always out of sync with the time frame for educational research which, even for limited questions, requires long periods of time to produce definitive evidence. Hence CBET is in the same position as most other educational policy where there will be limited definitive evidence to support or invalidate it.

**Educational perspectives when introduced**

I have concentrated in this section on the introduction of CBET in the last fifteen years. However there is a history of CBET which stretches back to the 1920s in the United States (Harris 1995, Tuxworth 1989) What the earlier history has in common with the current situation is the perception that there is a need to improve skill standards to meet the needs of a change to industrial and economic circumstances.

Each of the countries which introduced CBET at some time in the last 15 years has been motivated to do so by a change to economic circumstances. In Australia for example, in the mid 1980s, there was a recognition that the skills of Australia's workforce needed to be upgraded if the country was to undertake industrial restructuring and thus remain
competitive with other OECD countries (Dawkins, 1987). Similarly in Germany (Laeur Ernst, 1990) and the UK (Franklin, 1997) there was a recognition that the changing nature of work and higher skills requirements this created meant that there was a need for agreed national standards of skill.

The fact that the motivation for the adoption of a 'standards' approach (the term can be used synonymously with 'competency') to vocational education and training was economic rather than educational, inevitably led to a conflict about the educational value of such a policy. The social political and educational context of its introduction was different for each country. However what each had in common was the fact that a policy with significant implications for educational delivery and structures was developed without much (or in some cases, any) consultation with educators. It is fair to say that this was a deliberate decision on the part of governments as they felt that the traditional vocational education and training providers were not sufficiently in touch with industry needs to lead the reform process (Dawkins, 1987).

In Australia, training reform led by industry to meet its own needs was based on the development of nationally accredited industry competency standards. Such standards were developed by a National Training Board, which commenced its work in 1990 and expected to have completed this work at the end of 1993 (see next section for a more detailed analysis of industry focus of CBET). In effect the competency standards were the vehicle for driving reform in VET.

It is important to note that the educational reforms which were facilitated by the introduction of competency standards were many and, at the time, novel: the competency system opened up, for the first time, the possibility of students completing qualifications on the basis of what they could demonstrate they could do when they were ready to do so—in contrast to the traditional modes of education based on hours of completed instruction. The recognition of prior learning, credit transfer, articulation between educational levels through the development of a qualifications framework, provision for the accreditation of courses by external agencies and registration of private training providers, were important educational reforms made possible by the competency based system. All of these things are now accepted as part of the educational landscape
so it is easy to forget how radical these things once were. Competency standards were a way of implementing a whole raft of educational reforms which the government envisaged would improve the efficiency effectiveness and equity of the vocational educational and training system. Virtually the same can be said of developments in the UK and New Zealand.

**INDUSTRY FOCUS OF COMPETENCY BASED EDUCATION AND TRAINING**

This section of the paper aims to provide an overview of the ways in which the implementation of competency based education and training has attempted to incorporate the changing needs of industry over the last ten years. In the first instance, Australian approaches to this question are reviewed and subsequently compared to similar initiatives at the international level. The key question to be considered is the extent to which competency based education and training has been able to address the changing needs of industry.

**AUSTRALIA**

As in many other countries (Kerka 1999, James 1998 & Franklin 1997), it was believed that taking a competency based approach to skill formation in Australia was essential in order to enable industry to better respond to the increasing globalisation of international markets and increased international competition. It is worth outlining in detail the development and changes that have taken place in the implementation of CBET in Australia over the last ten years because this provides both an illustration of the problems of implementing a competency based system and but also how the system has been capable of adaptation.

When CBET was introduced in Australia in 1990, it was thought that existing approaches to vocational education and training were not adequately responsive to the changing needs of industry. Rather, it was believed that approaches to the provision of vocational education and training were informed by the educational priorities of existing training providers, which did not necessarily incorporate an accurate analysis of the changing needs of industry in the global economy. The approach ap-
pealed to most of the key groups interested in VET reform and wider micro economic reform. Industry as represented by the peak bodies perceived that such an approach would make public education more responsive to its needs, a belief shared by government and the unions. Government saw the potential of CBET to raise the quality of training.

There was little or no attempt to involve educators and in retrospect little understanding of either the conceptual or practical problems associated with the implementation of such a radical approach to education and training. This process of developing the competency standards was undertaken by Competency Standards Bodies which represented appropriate industry interests. In February 1990, a National Training Board (NTB) was set up to approve and disseminate the newly developed national competency standards. These standards were to form the basis of national competency based curricula. The NTB also drew up an eight level framework to link competencies attained to qualifications and to levels in occupations. This was known as the Australian Standards Framework (ASF).

In 1992, the Australian National Training Authority (ANTA) was formed, in order to prepare a national strategy for vocational education and training and to report on outcomes. It was to play a leading and critical role in designing and further developing the Australian vocational education and training system, i.e. the CBET system, so that it would continue to be responsive to industry and individual needs and provide a unified standards approach to skill development. The ANTA board was comprised of leading industry representatives in an attempt to guarantee that the training system was centered on the needs of industry.

These developments gave rise to significant criticisms from educators and researchers and later, from industry and employer groups, although for significantly different reasons. In essence, the major educational criticisms of competency based education and training centered on the claim that vocational education and training of this kind would not be able to develop skilled workers, or indeed, the deep-level learning and problem solving capacities needed for the new workplace.

**EDUCATIONAL CRITICISM OF CBET**

The NTB's early concept of competency and standards was considered to be too educationally narrow. It was criticised by educators and research-
ers for promoting a view of competence that was based on behaviourist principles which had little regard for the underpinning knowledge, values and attitudes that were considered essential for the development of skill and expertise. These same groups complained that competency standards were related to the attainment of narrow and short-term industry objectives, rather than to the attainment of long term skill development or educational achievement (Jackson, 1992, Brown, 1992).

Other educators also raised concerns that overly prescriptive views of competency, determined by industry standards, might not recognize the importance of knowing what, how and why certain actions are to be taken, and how to apply this knowledge to a variety of situations (Hyland, 1994, Smithers, 1993). The competency based education paradigm was also considered by others to be fragmented and to ignore the interrelationship between the different tasks performed in an occupation (Ashworth and Saxton, Field). It was felt to ignore the ways that students go about their learning. Some researchers (eg. Cornford 1997), argued that the modular approach to training failed to take into account the time required for students to practice skills, and to reflect on their learning so that information could be stored in long term memory.

In addition, because the system was perceived to focus on how to go about performing a task, some others argued that competency based education and training ignored the importance of skills which would help individuals to diagnose the root causes of problems and develop strategies for their solution. Others (eg. Gonczi and Hager 1991) argued that a competency based approach to VET was desirable but the narrow task based approach favoured by the NTB should be replaced by the holistic integrated approach which they implemented in developing competency standards for a number of professions.

As a result of these educational criticisms, the NTB expanded its definition of competency to include the knowledge, value and attitudes that needed to be expressed by the standards themselves. Also included was a guide to the evidence that would be required to indicate knowledge and understanding and statements about the ranges of situations that this competency would apply to. There were also concerns about assessment and particularly about the selection of those who were to make judgments (assessors) about whether or not the standards had been achieved.
INDUSTRY CRITICISMS

However, it soon became apparent that industry and employer groups also had significant reservations about the success of early forms of competency based education and training. In a review commissioned by ANTA in 1994 (Allen Review, 1994), it was found that there had been little progress made in implementing the new reforms, particularly in some industry sectors. These reservations were based upon the belief that the competency standards were overly prescriptive and inflexible. Companies feared (with some justification) that by signing on to the national training agenda, they could be presented with an industrial fait accompli regarding job classifications and conditions of employment. Thus the Allen Review considered that what was needed were national competency frameworks rather than detailed prescriptions of competency standards.

The key players came to recognise that for the new system to be sustained, firstly it had to be simplified, and secondly the link between the industrial and the training domains had to be diminished. The modified and somewhat simplified system is now known as the National Training Framework. The chief component of this framework was the commitment to what is called Training Packages.

THE CURRENT SITUATION IN AUSTRALIA

Training Packages are now the cornerstone of competency based training in Australia. Each package –there are now around 60 in all– is an integrated delivery and assessment resource comprising:

- competency standards: individual outcome statements ("units of competency"), developed in close consultation with industry, specifying workplace performance requirements and the criteria by which competency is evaluated;
- the rules governing the packaging of competency units into national qualifications - typically, these rules specify the "core" (compulsory) units, a bank of "stream" units and a broad menu of elective units; and
- guidelines for assessing workplace competency under the particular package.
Packages also include a wide range of supporting materials to assist in workplace implementation.

There are three critical differences between competency based training under Training Packages and the conventional classroom focused, learning outcome based, training of past decades:

• under Training Packages, the learner receives a national qualification *if and only if* that person is assessed as competent in the units of competency that are prescribed for that qualification under the package - the *learning pathways* open to individual learners are limited only by resources and imagination;
• except in the rare instances where legislative provisions apply (such as in the operation of certain vehicles or plant and equipment, or where professional registration is a prerequisite for practising a vocation), there is no judgement about where, when or how the learner acquired the skills and knowledge that competency entails; and
• accordingly, there is no judgement about how much (or indeed how little) time a person takes to acquire competency - a radical departure from, for example, the traditional craft based apprenticeships.

It was recognised very early on that this quite radical system would stand or fall on our success in building quality assurance into the process. Confidence in the system's products - qualified learners, whose workplace capabilities are nationally certified - depends crucially on the perceived rigour of the learning and particularly the assessment process.

There are two key quality assurance points under the new national system. The first is the stipulation that only a qualified workplace assessor—an assessor who has him/herself been assessed as holding the competencies of assessing competence—can undertake or oversee competency assessment.

The second relates to the requirements for becoming a Registered Training Organisation. Only an RTO can issue a national qualification [endnote: this is not to say that only RTOs can deliver training or assess competence —on the contrary, the model actively promotes and encourages training...
delivery partnerships between RTOs and enterprises (who may indeed be RTOs in their own right), or between registered and non-registered providers (such as high schools). The scope of registration of an RTO prescribes the Training Packages and qualifications it is registered to deliver, and the industry and occupational areas it is registered to service. The currency of its registration is contingent on a cycle of review and compliance audits, to determine the quality and consistency of its operations, its products and its services.

There have been significant teething problems with such radical and far reaching reform. There are groups in the community — particularly those who have accessed VET for purposes of personal rather than vocational advancement — whose needs have undoubtedly slipped in priority. There are demands and stresses on VET teachers, who are being asked to move well beyond the comfort zones they have built up over several decades of traditional training delivery.

There remains a lively debate in VET circles in Australia as to whether, in moving from a content focus to an industry focus, we have allowed the “national currency” (units of competency) to become too task and outcome based, to the diminution of theory and underpinning knowledge. In NSW (the largest State), the Government has retained traditional curriculum as an interface between competency outcomes and theory. And Training Package developers are now charged with paying greater attention to underpinning knowledge in either the competency standards themselves or by reference in the supporting materials.

There was undoubtedly too much attention to the “front-end” structural reforms at the expense of “back-end” courting and professional development of those most immediately affected: traditional classroom teachers in vocational colleges (see Noonan Campus Review, 12 April 2000). They should also have been much more closely involved in the design and development of the Training Packages that they primarily are asked to deliver. This does raise the issue of the development of appropriate standards.

The message — that the NTF, far from being the end of their world, offered them new vistas and continued relevancy in a rapidly changing world — was sadly neglected in the early days of “crash through or crash”. It is an oversight from which those who may wish emulate Australia’s experiment would do well to learn.
As the CEO of one the Industry ITABS has recently put it (Gilling, in press) “Finally, we took a while to take to heart the message from industry and the wider community that the system had to be as simple, stable, transparent and non-bureaucratic as possible. There was too much fiddling with the system in the early days, with far too many acronyms, too many multi-layered “frameworks”, and too many regulatory and administrative bodies involved in the process.”

**DEVELOPMENT OF APPROPRIATE STANDARDS**

The kernel of the CBET system is valid competency standards which genuinely reflect the competencies required in industry. This has been a complex issue from a theoretical perspective from the beginning, though the original architects of the CBET system in the UK and the subsequent developers of the system in other countries have largely ignored the complexity.

The system set up in the UK and followed in Scotland, Australia and New Zealand has been to set up industry bodies whose job it has been to develop the competencies, through some method of workplace analysis. What has not been recognised or acknowledged is that the approaches chosen always reflect a set of assumptions about the nature of work and the nature of competence. This question has been examined in detail in the scholarly literature (see eg Gonczi, Wolf, Franklin 1997, Kerka 1998) and can’t be dealt with in detail here.

However, what is clear is that the conception of competence is a contested notion. This is of great significance since there is an implicit assumption amongst standards developers (eg. in the Training Packages in Australia) that competence can readily be reflected in competency standards which break down work into its elements. This does not mean that it is not possible to develop competency standards but rather, that to develop valid standards, one needs to use sophisticated social science research methods which are time consuming and expensive. Except in a few instances this has not been the case.

There is also the problem as outlined in a recent report by Mulcahy and James (1999) that small business was reluctant to specify the com-
petencies needed in their industry due to the fear of competitors. Field (1996) also points out that industrial survival in the competitive workplace depends on innovative solutions to improvement which is the antithesis of prescribed procedures (as laid out in competency standards). We are left with the conclusion that the foundation of the CBET system is shaky at best.

**DEVELOPMENTS IN OTHER COUNTRIES**

The history of CBET in the UK has been similar to that in Australia, though one major difference has been the continued separation of general vocational qualifications from the competency based qualifications. The traditional qualifications authorities (e.g. BTEC) have maintained that their brief is essentially educational and that they need to remain separate from qualifications which attest to competence.

A review of the National Vocational Qualifications (NVQ) system after seven years (Beaumont 1995), found occupational standards were marred by complex jargon-ridden language and inflexible structures. These issues had contributed to the failure of industry to fully take up the CBET system. As suggested by the Beaumont review, in 1999 a new qualifications framework was set up which aimed to bring together vocational and general qualifications. The success of this reform is yet to be determined, but currently there is far less commitment from industry to the competency based system that has been the case in Australia.

In both Scotland and New Zealand CBET systems have been set up over the last decade or so. Over recent years however national frameworks have been established which have attempted to bring together general and vocational qualifications so that it is possible to progress through either route to university qualifications.

In the USA there has not been a widespread implementation of CBET to date. In the 1990s, the standards movement began to articulate the knowledge/skills needed by industry and began to develop an aligned system. The 1998 Workforce Investment Act set a legislative framework for earmarking funding for workplace training, based on market needs and performance. Under the Act, Career centres, educational institutions and programs that meet the changing needs of employers are financially
rewarded. In some cases, funding will follow individuals who choose those providers with proven success.

SUMMARY

In summary the CBET system in all the countries in which it has been introduced was developed to ensure that the needs of industry were met by the vocational education and training system. This has been part of a wider micro economic reform agenda which has attempted to ensure that industry remained competitive in the global economy. In all cases, however, there have been serious problems of implementation.

In retrospect it can be seen that the major problems have been that:

- systems set up by bureaucracies have been too rule bound, inflexible and complex for an industry sector under pressure and resentful of bureaucratic direction; and
- there was a failure to ensure that those who needed to deliver the training were involved with the development of the system and were sufficiently well trained to implement it.

Nevertheless it is clear from the research that the CBET system has been welcomed by most parts of industry. It has enabled industry to articulate its needs more clearly than in the past and it has enabled industry to choose who should deliver the education and training from amongst a range of providers.

STRENGTHS AND WEAKNESSES OF A CBET CURRICULUM

As has been outlined in the previous section the concept of competence remains contested. So too does the question of what constitutes a competency based curriculum.

In most recent reforms to CBET in Australia, the introduction of Training Packages has meant that there is no need for a curriculum at all in the sense of a public document which describes a coherent sequenced set of learning experiences which, in combination, develop an individual's
competence. The Training Packages are specifically designed to allow for a variety of unspecified ways (and timeframes) to develop an individual's competence.

Whether this is viewed as a strength or weakness is largely a product of one's concept of competence. If it is believed that an individual's competence in a particular job in a specific industry is able to inferred from the completion of tasks outlined in the competency standards and that this can be developed on the job through experience, then presumably this lack of a specified curriculum is viewed as a strength. If, on the other hand, it is believed that the development of competence is a complex cognitive activity which requires the individual to make connections between practice and theory, to be able to transfer learning to different situations, to demonstrate the capacity to learn how to learn and the actual development of expertise, then presumably the lack of curriculum is seen as a weakness.

This has recently been argued by Cornford (1999) where he suggests that mere competency statements are inadequate as a basis for teaching and learning. He argues a knowledge of cognition and the relationship between practice and theory is needed if people are to develop skill and a wider competence. Gott (1995) has previously argued the same way in her empirical work with the US Armed Forces- that there is a need for curriculum and teaching in the development of skill which is situated sequenced and supported. This implies repeated coaching, observations by experts and feedback and is based on the recent work in situated cognition by Greeno et al. (1997).

It is important to note as Misko (1999) does that there is nothing in the Training Packages which would prevent teachers with the requisite training developing curriculum which addressed these issues. However given the fact of an open market for training and the fact that many people who oversee training will not be adequately trained, it seems likely that these issues will not be addressed adequately.

Similarly the development of modular curriculum which is associated with CBET has been both praised and criticised. The criticism has largely been on the basis of fragmentation and the lack of realisation that prior mastery of skills and knowledge need to be taken into account. Cornford (1997) suggests that there is a need for a spiral curriculum, the antithesis of
a modular approach, where topics are retuned in a number of iterations before true understanding is gained.

A recent OECD conference (Oslo 1999) involving Nordic countries debated the modularisation of curriculum in their countries and expressed a worry that this tendency led to the lowering of skill standards if modules were not connected and well sequenced.

It has been posited by Gonczi (1996), that a competency based curriculum, based on an integrated concept of competence is achievable through a problem or ideas based curriculum. Here, as in a problem based professional degree course such as the medical degree at McMaster University in Canada, theoretical concepts are uncovered in an interdisciplinary way through the solution of real life problems. In the solution of the problems outlined in the curriculum, students develop increasing levels of competence through combining attributes (knowledge, skills, attitudes and values) in various ways. If it is accepted that competency consists of the capacity to act intelligently and critically in the (work) situation that an individual finds themselves, then a problem based curriculum — combined with actual real life practice — seems to be the competency based curriculum par excellence. However a different conception of competence will lead to different conclusions.

It is important to mention here that a number of countries, but most particularly Australia, has experimented with the use of a competency based curriculum and assessment system in higher education. Many of the professional associations have developed competency standards which now underpin at least some of the elements of the professional curriculum in university professional faculties. Such is the case in Nursing and many other allied health areas. It is also increasingly becoming the case in the teaching profession. Various of the Law Societies in the various Australian States have also developed professional standards which underpin the practical legal courses and, in the case of NSW, the accreditation of specialist lawyers (Gonczi et al 1995).

Tennant and Gonczi (1994) and Evans and Butler (1992) also speculate about using an expert model of curriculum to develop true competence. Is there value, they ask, in basing a curriculum on what we know about how experts act? They argue that in fact, a problem-based curriculum could accommodate these expert models.
In summary, there is great merit in a competency based curriculum which places its primary emphasis on a practice based curriculum. This is in line with the best theories about learning emerging from the US literature in situated cognition. However, the mere provision of the opportunity to practice without a considered sequencing of experience, time to practice, receive expert feedback and reflect on all of this will be manifestly inadequate as curriculum and pedagogy. Modular curriculum which has the strength of enabling individuals to achieve in a relatively short time and to add these over time to obtain qualifications, could well be a dangerous path if we are seeking high levels of competence of the kind suggested by the integrated view of competence — one where individuals combine knowledge, skills, attitudes and values in the solution of problems they face.

It also needs to be noted that many of the OECD countries where vocational education is strong (e.g. Austria, Norway) are increasing the general education component of their vocational programs both in order to open up new pathways and to ensure that a basic understanding of the culture was being achieved (Sweet 2000).

**Assessment of Competence**

Competency based assessment is at the heart of a competency based approach to education. As the leading English proponent of CBET, Jessup has put it: "assessment becomes an integral part of the learning process as well as a means of evaluating it." However it is the aspect of competency based education which is least understood.

In the 1990s, assessment reform was seen as a vehicle to address a wide range of educational issues extending beyond the classroom. For some it had the potential to improve classroom practices. This reform included:

- reducing the power of standardised assessment to determine what is taught;
- demystifying assessment by providing students with a clear picture of what needs to be learnt; and
- breaking down the dichotomy between knowing and doing (otherwise known as propositional and procedural knowledge).
Others also saw the assessment process as a way of ensuring that institutions produce the sorts of students that industry wants. Many industry groups, for example, have argued that to gain middle level qualifications, students should be competent to industry standards and should be assessed on the job, undertaking real tasks.

The suggested assessment framework was characterised by being:

- standards or criterion-referenced;
- direct or authentic.

The advantages of criterion-referenced assessment, that is, judging performance against pre-determined standards, are clear. If it is possible to specify learning outcomes which cover the aims of the curriculum, then these could be taught and assessed in unambiguous ways, thus overcoming problems of validity, reliability and fairness. The central problem with criterion-referenced testing, however, is its task-based approach to the conceptualisation of competence, and the consequent potential for reductionism and overemphasis on observed behaviours, from which knowledge and understanding of the appropriate constructs cannot necessarily be inferred. Griffin (1995) suggests, however, that this need not be a problem. He interprets competency in terms of a progression of tasks or stages. His work provides at least the theoretical possibility of marrying measurement with judgement and evidence-based approaches with competency assessment.

Criterion-referenced and competency-based assessment are almost always contrasted with norm referenced assessment, though a number of writers have pointed out that it is not possible to escape from norms, since all assessors have ideas about what is reasonable performance in the domains they are familiar with. Nevertheless, there are differences between the assumptions of a measurement model and a standards based model and these differences lead to quite different assessment practices. Taylor (1994) suggests that the main assumption of the measurement model is that of trait theory. That is: that humans differ from each other on various traits; that it is possible to measure these differences relative to others and that we can do this reliably. The aim of such a system is to rank individuals, usually using standardised tests and usually arriving at a single score obtained through psychometric analysis and manipulation.
The assumptions of the standards model, on the other hand, are quite different from those of the measurement model. The standards model claims that:

- it is possible to set public standards;  
- most learners can achieve them;  
- different performances can reflect the standards;  
- assessors can internalise the standards; and  
- assessors can judge different performances consistently.

Such assumptions can present difficulties, but they also suggest the need for a multifaceted approach to assessment based on what an individual can do. Furthermore, what an individual needs to be able to do is anchored in publicly defined standards, criteria and targets.

The case for performance-based assessment is put forcibly and clearly by Wiggins (1989), Frederikson and Collins (1989), Linn (1993), and Bailey (1995). They argue that assessment that is designed to test performance standards (or competency standards) can motivate learners better than norm referenced tests; that this kind of assessment can fulfil validity criteria and so be acceptable to the testing profession; and that it is more valid than traditional tests.

Finally, the literature argues that the assessment of competence needs to be direct. The potential advantages of directness are obvious, but as Linn (1993) argues, there is still a need to provide empirical evidence of construct validity and particularly of consequential validity.

There remain unanswered questions about competency-based assessment using performance assessment. These are:

- the degree to which contextualised assessment needs to be supplemented by decontextualised assessments;  
- whether to assess complex as opposed to disaggregated skills.

The first question, concerning contextualised assessment, would seem to be of greater concern to general education, since assessment for occupational certification should be quite clearly specified in competency standards. Hence contextualised assessments should be able to assess the
appropriate attributes. The need to use decontextualised assessment in
general education is outside the scope of this argument. However, it does
appear that the less clear the constructs being assessed are, the greater
the need to test decontextualised knowledge.

There is no easy answer to the question of whether to assess com­
plex or disaggregated skills. There is a relationship between the parts of
a skill and the whole complex skill. Often, learners' capacity to synthesis
and integrate parts of a skill depend on their ability to perform the con­
stituent parts. Perhaps it is wise, then, to attempt to assess both complex
and holistic, as well as disaggregated skills.

There are however problems with introducing such a standards based
assessment system in vocational education. The most apparent of these
from the literature is the difficulty of retraining teaching staff who have
spent much time implementing assessment based on measurement as­
sumptions. The tendency has been to revert to the reductionist models
of criterion reference assessment rather than consider the possibility of
introducing a much richer standards based approach. This has led, for
example, to the implementation of a binary system of assessment which
is completely unnecessary, and more generally to a dangerous reduction­
ism which trivialises the notion of competence.

**IMPACT OF CBET ON ECONOMIC DEVELOPMENT**

The nexus between national economic prosperity and educational policy
has been the subject of numerous studies over the years. In fact there was
an entire field of study, now virtually moribund, associated with this ques­
tion: the economics of education.

One aspect of this work is the so called Human Capital theory, which
emerged in 1960s. The focus of this work was the relationship between
national educational levels and individual and national economic well being.
The general orthodoxy before the work of scholars such as Blaug (1972)
was that educational spending was necessary and correlated with (and
causally linked to) economic prosperity. Since Blaug's pioneering work this
relationship has been questioned. Further, since Papadopoulous's work
in the early 1980s there has been little serious study of the relationship.
The main reason for this is simply that there are too many variables associated with economics to establish a clear relationship between this and education to be able to make any meaningful comparisons between a competency. There have been some small scale studies undertaken in the United States which posit a relationship between a local area and educational level, but there are very few of these and they are certainly insufficient to draw any general conclusions. Given the state of this field of research it is not surprising that there is no scholarly literature on the impact of CBET on economic development.

**DIFFERENCE BETWEEN CBET TRAINED AND NON-CBET TRAINED**

As recommended by Misko (1999), longitudinal studies and studies involving the use of control groups are required in order to reach conclusions about the difference between CBET trained and non-CBET trained students. This is due to the fact that competency based education and training is a relatively new initiative that has undergone significant changes over a short period of time, without commensurate monitoring and research on its outcomes.

There is however some evidence which suggests that competency based trained students are able to more effectively transfer their skills to new environments when compared to those who have accessed more traditional forms of education and training. A recent research project in the United States (Cedja, 1998), in which five community colleges and one liberal arts college collaborated on developing a seamless competency-based program of courses has shown that as a group, those students participating in the project had higher post-transfer success than non-participating students.

Similarly, researchers from the Australian National Centre for Vocational Education Research (Misko & Saunders 1995) have found that where employers had implemented strategies for the recognition of current competencies and wages had been linked to these competencies, they reported that these strategies had produced benefits in terms of employee motivation and improved productivity.
Research in Ireland on the impact of competency based education for youth workers (McRoberts et al. 1998) also suggests that the use of such methods resulted in improvements in the youth program, in addition to improving its effectiveness in terms of meeting learning needs.

There have been a number of studies in which teachers and students have been asked to evaluate the effectiveness of CBET. These are detailed in Misko (1999). On the whole they suggest that teachers have had difficulty in identifying the benefits of the changes to CBET.

Billett’s study (1999), provided both positive and negative evaluations of CBET, but teachers were mainly critical of the fact that their role in helping students to develop skills in lifelong learning had decreased. On the other hand they found that CBET delivered better opportunities for multi-skilling in a particular industry they investigated, better relationships between ITABS and the firms in that industry and greater workplace relevance of training.

Canning (1999) on the other hand undertook interviews of students who were undertaking national vocational qualifications and Scottish vocational qualifications over a three year period. They found that the CBET approach encouraged surface level knowledge and spent too much time on procedural knowledge. Cornford (1997) surveyed Australian teachers and reached similar conclusions.

It is hard to place confidence in research studies which rely entirely on surveys and are limited to the perceptions of teachers and students. More sophisticated studies which would lead to more valid conclusions would involve quasi-experimental designs and longitudinal studies as Misko has suggested. Unfortunately these are difficult to undertake and have become unfashionable in social science research over recent years. Clearly however there is a need to prioritise further research in this area.

**PREPARATION OF TEACHERS**

There are three categories of people who are involved with the implementation of CBET: existing teachers trained under a previous model of vocational education, new teachers and industry trainers.

There appears to be no literature on how the training of these new teachers has taken place over the last decade or so nor any studies on how older teachers have been retrained over the last decade.
In Australia, the qualifications of industry trainers who can be involved in the delivery and assessment of competency based awards has been set by an industry body (Workplace Trainers and Assessors) and outlined in a training package. This requires trainers to develop a set of competencies at certificate IV level on the qualifications framework. There has been considerable controversy about this development and the suggestion that this level of training is inadequate. (See Campus Review over March/April 2000 for a discussion of training packages and their problems).

The decline in the professionalism of the vocational teaching and training workforce in Australia as measured by degree level qualifications has been demonstrated by Chappell and Gonczi (2000) in their submission to the Review of Teacher Education in NSW. The conclusion that can be drawn from their submission is that there is a perception amongst policy makers and industry representatives that a CBET approach to vocational education and training makes professional level training unnecessary.

However there does not appear to be any systematic investigation of the adequacy of this level of training and its quality nor of the capacity of trainers to adequately deliver and assess competency based education and training.

**CONCLUSION**

CBET was introduced in all the countries in which it currently operates in order to improve the quality of vocational education and training. In all these countries it was agreed that vocational education did not adequately meet the needs of industry and that this was a barrier (though only one amongst many) to industry reform and to international competitiveness.

It is too early to determine the effectiveness of CBET and the extent to which it has produced the skilled, flexible and critical workforce that studies have suggested are increasingly needed in the contemporary economy. CBET continues to evolve in practice and this has made studies of its effectiveness difficult. There is clearly a need for more sophisticated studies and a more systematic approach to the evaluation of CBT. This might well be best carried out in countries which have only partially implemented it and where genuine comparisons and longitudinal studies can still take place.
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Competency based education and training in Mexico 1995-2000. The experience of the National College of Technical Professional Education (Conalep)

ANTONIO ARGÜELLES

ANTECEDENTS

In 1985 Mexico, in the midst of a severe economic crisis, decided to confront the challenges of globalization and open its economy to international competition. The country became a member of the GATT and, a few years later, decided to seek a closer relationship with selected commercial partners and regions by means of free trade agreements. The North American Free Trade Agreement\(^1\) with the United States and Canada came into force on January 1, 1994 and a Free Trade Agreement with the European Union has recently been approved.

The challenge of globalization is generally understood in economic terms as tending toward free trade (the elimination of trade barriers interpreted generally as government subsidies to help make products more economically competitive on the world market) although it should be pointed out that this process has been largely a result of developments in information technology and enshrines the associated phenomenon of cultural uniformity at least in the material aspects of culture.\(^2\)

The greater insertion of Mexico into the international economy had the immediate consequence of pitting Mexican exports against those of other countries with the inevitable comparisons of quality, production costs and productivity. This, in turn, brought into question the educational sector of society and, more explicitly, technical education.

Productivity and quality were seen principally in terms of the rationalization of human and material resources for production and, as part of that rationalization process, the training of human resources for industry. The idea of a general or classical education began losing ground in

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\(^1\) NAFTA for its initials in English; TLC for its initials in Spanish.

view of the urgent need to upgrade more practical skills and train up­
coming generations for the new production processes which were being
implemented.

The validity of the dichotomy which already existed between edu­
cation and training began to be questioned3, especially in view of the fact
that new practical skills such as computation and the manipulation of new
electrodomestic technology had to be learned by all. There were basic
practical skills, especially related to information technology, which were
essential learning for all educational endeavours.

It’s in this context that in 1994 the Mexican government, with the
support of the World Bank, developed a far-reaching Project to modernize
training and technical education in the country.4 The modernization would
be in the context of the development of a National System of Labour
Competencies and their Certification and would affect the principal public
technical schools at the upper secondary level, including CONALEP.

In this chapter we will present a brief outline of the original Project,
describe how it has been implemented in CONALEP, and explore some of
its more important implications for the College. We will describe the
experience of CONALEP in the process of the development and imple­
mentation of competency based education and training during the last
five years as well as develop some reflections on the generalization of the
model both in the formal careers which have a three-year duration and
in short training courses offered by the institution.

The National College of Technical Professional Education (CONALEP)
is a public institution founded in 1979 to impart technical education at the
upper secondary educational level. Actually the College has 260 campuses
and an enrolment of approximately 220,000 students. The campuses are
distributed throughout the whole country.

The College was founded as a terminal institution — situation which
prevailed until 1997 when CONALEP was authorized by the Federal Sec­
retariat of Public Education (SEP)5 to include six extracurricular subjects

4 Proyecto para la Modernización de la Capacitación y la Educación Técnica. Staff Ap­
5 The official name of the institution in Spanish is Secretaría de Educación Pública.
which students could study to obtain a Certificate of Equivalence to the award established as a prerequisite for entrance to university. All graduates of CONALEP are officially authorized by the Federal Secretariat of Education to practice their respective professions.

**PROJECT FOR THE MODERNIZATION OF TECHNICAL EDUCATION AND TRAINING**

The *Project for the Modernization of Technical Education and Training* (POMETyC) was formulated in 1994 with the objective of "improving the quality of technical education and training in Mexico so as to satisfy in a flexible way the needs of the productive sector".\(^6\)

The Project is the context for the introduction of competency based education in training as all official actions from the creation of the *National Council for Standardisation and Certification of Competency Standards* (CONOCER)\(^7\), to curriculum reform in institutions of technical education, to the certification of competencies, are contemplated by it.

The Project identified the following problem areas of technical education and training in Mexico:

- a limited preparation of workers for technical/vocational education and training; the academic model of technical/vocational education and training was based on obsolete academic concepts and occupational categories;
- the generally low level of training courses;
- an insufficient participation of the productive sector in the design and operation of training.\(^8\)

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\(^6\) *Proyecto para la Modernización de la Capacitación y la Educación Técnica* Staff Appraisal Report (3805-ME), Banco Mundial, 1994, p.7.

\(^7\) The official name of the institution in Spanish is *Consejo Nacional de Normalización y Certificación de Competencia Laboral*.

\(^8\) *Proyecto para la Modernización de la Capacitación y la Educación Técnica* Staff Appraisal Report (3805-ME), Banco Mundial, 1994, pp.19-23.
It was recognized that there were lessons to be learned from training experiences in Mexico and which should be incorporated into the Project. On the basis of evaluations by the Secretariat of Work and Social Prevision (STPS) and by CONALEP of their respective training programmes, a number of recommendations were formulated for the World Bank project.

The first of these was the need to carefully select candidates for career and short training programmes. It was important not only that candidates clarify their expectations concerning career and short training programmes, but also that the requirements to study these programmes also be clearly specified.

The second lesson which had been learnt was the importance of rigorously evaluating the results of these programmes compared to their proposed objectives.

Thirdly, it was important to create a single system of awards in view of the diversity of award systems and academic levels amongst different technical education and training institutions. A single system of certification would be a guarantee to employers concerning the abilities and knowledge of technicians, and a guarantee to technicians that their training would be valid in the whole country.

Fourthly, experience had shown the importance of a close relationship between institutions of technical education and training on the one hand, and industry on the other, so as to guarantee the success of their programmes. The specific areas for this collaboration would be in the identification and formulation of competency standards, in redesigning curriculum, and in monitoring and evaluating the results of the project reflected in better trained technicians and a lowering of the costs to industry of training personnel.

Fifthly, in view of the rapid changes in the economic structure of Mexico, career programmes and training courses should have a high degree of flexibility and adaptability. It had been shown that long and rigidly structured courses were directly related to high desertion rates and a lack of interest on the part of workers to improve their skills.

10 The official name of the institution in Spanish is Secretaría de Trabajo y Previsión Social.
Sixthly, the distinction between training for work and training in the workplace should be carefully analyzed and a more efficient coordination established between both aspects of training. As the project document indicates, “a weak programme of training for work increases costs and diminishes the effectiveness of the posterior training in the workplace; and a poor workplace training means that abilities acquired during training for work quickly become obsolete.”

“Modernization” of technical education and training was understood specifically in terms of the introduction of competency based programmes in institutions of technical education so as to bring Mexico in line with other OCDE countries. The specific model implemented in Mexico was to be based on that of the United Kingdom, where it was considered appropriate, although it was recognized that competency standards from other countries could also be adapted to local conditions.

The Modernization Project would be the responsibility of the Federal Secretariats of Public Education (SEP) and of Work and Social Provision and would be implemented principally in educational institutions supervised by the General Direction of Technological and Industrial Education of the SEP and in the National College of Technical Professional Education (CONALEP).

The participating educational institutions would not be autonomous in the implementation of the Project but would work in coordination with the mentioned Federal Secretariats and with the National Council for Standardisation and Certification of Competency Standards eventually created by Presidential Decree in 1995.

To remedy the general problems of technical education and training mentioned earlier, four lines of action were proposed:

1. to establish a system of labour competencies and a certification process as a means of establishing the effectiveness and quality of training programmes;

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11 Proyecto para la Modernización de la Capacitación y la Educación Técnica Staff Appraisal Report (3805-ME), Banco Mundial, 1994, p.28
12 Proyecto para la Modernización de la Capacitación y la Educación Técnica Staff Appraisal Report (3805-ME), Banco Mundial, 1994, p.31
13 Proyecto para la Modernización de la Capacitación y la Educación Técnica Staff Appraisal Report (3805-ME), Banco Mundial, 1994, p.30
2. to design modular training programmes based on the defined competencies so as to increase the flexibility and the relevance of training systems;
3. to achieve the participation of the private sector both in the design of training courses and their promotion by means of incentives to individuals and companies; and
4. to establish the necessary communication systems and to design and implement investigations in support of this new orientation in training.

By means of these lines of action, the Modernization Project proposed to achieve a close working relationship between educational and training institutions and industry so as to widen opportunities for the incorporation, development and permanence of individuals in work, for the improvement of productivity levels and competitiveness of industry, and of the national economy as a whole. With the help and participation of the business, work and educational sectors, programmes of technical educational institutions in the country would be modernized with a view to developing a new relation between industry, the worker and the school.

Despite the fact that the four lines of action of the Project were considered as separate endeavours, they were not to be considered independent.\(^{14}\)

The more immediate tasks were the creation of the National Council, the integration of industry working groups to define competencies and the delivery of competency based programmes in institutions of technical education and training.\(^{15}\) They were programmed to begin almost simultaneously between the third quarter of 1994 and the first quarter of 1995 –dates which were later to be modified depending on the approval of the World Bank Loan. Nevertheless, some activities were programmed to be implemented simultaneously when they were clearly successive.

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\(^{14}\) Proyecto para la Modernización de la Capacitación y la Educación Técnica Staff Appraisal Report (3805-ME), Banco Mundial, 1994, p.30

\(^{15}\) Proyecto para la Modernización de la Capacitación y la Educación Técnica Staff Appraisal Report (3805-ME), Banco Mundial, 1994, Anexo 8, Cronograma de Actividades.
It is significant that the Project, both in its pilot phase as well as in the second, more general, phase was to be limited to institutions that were terminal at that time (the National College of Technical Professional Education (CONALEP); Centres of Studies for Industry and Services (CECATIS); and Training Centres for Work in Industry (CETIS). Non-terminal upper secondary technical colleges (CBTIS) were not included in the Project.

The importance of the introduction of competency based education and training in Mexico is evidenced by references in official documents of public planning in which a series of strategies were defined for the introduction of this new educational mode in technical education and formation of human resources in Mexico (inclusive of both formal education and training in and for work).

The policy emphasis indicates that the Modernization Project was more an initiative of the educational sector than of industry.

**Public policies to develop the competency model**

The National Development Plan is the basic instrument of the Federal Executive to establish the goals which should be reached during a six year governmental period. On the basis of the National Development Plan, sectoral programmes are developed.

The *National Development Plan 1995 – 2000*\(^{16}\) proposed to establish a closer coordination between industry and education. So as to guarantee this, educational and labour authorities were charged with promoting, with the participation of the productive sector, the establishment of competency norms, whose structure should respond to the actual and foreseeable conditions of work. These norms would be integrated into a standardized system of labour competencies.

- The defined norms should be the starting point for the restructuring of study programmes for technical education and training, and should be a reference point for upper secondary education in its two modes: terminal and bivalent;

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A new system of certification of labour competencies would be applicable to competencies empirically acquired on the basis of the norms defined by the National Council for Standardisation and Certification of Competency Standards;\(^{17}\)

Training programmes would be made more flexible such that students would be able to alternate between study and work during their lives.

Taking its cue from the National Development Plan 1995 - 2000, the Programme for Educational Development 1995 – 2000\(^{18}\) proposed to:

- Establish mechanisms to recognize studies which adults may have left uncompleted in the formal educational system so as to facilitate the certification of their abilities and practical knowledge acquired during their lives;
- Adapt curriculum content to the characteristics and context of adults without affecting academic standards, so as to help them establish inter-connections between knowledge acquired by whatever means;
- Make technical education, training for work and professional formation an on-going life experience;
- Support initiatives by institutions experimenting with new delivery modes as well as the reform of study programmes which try to achieve a better quality technical education, the advancement of knowledge, the relevance of study and training programmes and the efficient use of material and human resources;
- Study the possibility that work experience and practical knowledge be considered a positive advantage for the selection of students for upper secondary and higher education. The general indications of the Standardized System of Labour Competencies should be taken into consideration.

In the case of CONALEP these policies were reflected in the Institutional Development Programme 1995 –2000\(^{19}\) where Education based

\(^{17}\) Consejo Nacional de Normalización y Certificación de Competencia Laboral.


on Competencies was elevated to the level of a strategic project of the College, even though it was at first limited to training for work. Nevertheless, if it was not obvious at the time the document was formulated, it soon became obvious that competency based education was also very relevant to the formal career programmes offered by the College.

With specific reference to the *Project for the Modernization of Technical Education and Training*, the College proposed to be an active participant in all stages of the Project and in the promotion of competency based training.

**Pilot project**

It was proposed to implement the Modernization Project in two phases—a pilot project during the first 18 months with the objective of assisting participating institutions to gain technical experience in the development and operation of competency based training; and a second phase in which that experience would be used to convert all training courses into competency based training.

The pilot project would begin in 1995 and be limited to courses in the areas of administration, information technology, building, electronics and telecommunications, maintenance, metal mechanics and metallurgy, automobile mechanics, tourism, and systems of electrical maintenance and electronics.

The definition of competencies and the selection of teaching materials for the pilot project would be adapted from those used in other countries. The pilot project also contemplated the need for a reform of course content, the training of teachers in labour competencies and new approaches to teaching them, and the replacement of obsolete equipment in workshops and laboratories used for teaching.

In the second phase, which was programmed to begin in 1996, the development of more appropriate teaching materials was proposed, as well as the extension of the project to interested institutions, covering 9 occupational areas and the construction of courses in a modular fashion. This phase would also include the promotion of a change of attitude in all of technical education and training in Mexico, trying to develop a common language amongst all parties. A comparison of the qualities and productiv-
ity of graduates from competency based programmes was contemplated as well as an evaluation of the organizational and administrative changes made by the institutions as a result of the introduction of competency based education and training.

Despite the fact that the second phase of the project supposed the creation of a *National Council for Standardisation and Certification of Competency Standards*, and the existence of officially defined mexican labour competencies, experience showed that the identification and definition of labour competencies was not an easy task.

The problem was broken down into three related aspects.

Firstly general principles (norms) for the identification and definition of labour competencies, as well as for their certification, had to be established. As far as possible these principles had to be objective, independent and applicable to all sectors of the economy and in all regions of the country.

Secondly, a methodology for the identification and definition of labour competencies had to be developed which would be acceptable to training institutions and industry and which would guarantee a level of confidence of industry in the results of the Project. These labour competencies were also described as "norms" in the sense that they would be normative for specific occupations.

The definition of technical norms of labour competencies (*normas técnicas de competencia laboral*) would express the necessary requirements for the correct fulfilment of productive functions. The norms would allow for the evaluation of the level of competency of an individual and for the certifying of that competence, independently of how it might have been acquired. A person would be considered competent when he/she shows, in an assessment process, that he/she possesses the knowledge, abilities, skills and aptitudes defined by the technical norm of competency and is capable of performing a productive function efficiently.

Thirdly, procedures for the assessment of competencies of trainees and the evaluation of training programmes also had to be developed and these, in turn, had to respond to the changing needs of the labour market. Trainees who fulfil the assessment criteria, linked in turn to work functions and standards, would receive an award. The authorization and accreditation of certifying bodies would be according to the legal requirements established by the National Council.
Without having to specify how or where a labour competency had been acquired, the worker could obtain a formal recognition of his/her abilities and skills. This required a certification process which would guarantee the employer as to what an employee was capable of doing.

Labour competency awards would have national validity since they would be based on national norms and be issued in accordance with general and specific rules, also national. They would be controlled by the National Council for Standardisation and Certification of Competency Standards.

It was thus proposed to induce a change in the whole system of training so as to improve the quality of these programmes through the creation of an external certification process which, indirectly, would evaluate the quality of training programmes and, as a result, of the training institutions.

The Project established as a goal the certification of 160,000 people between 1997 and 1999.

**THE PILOT PROJECT IN CONALEP**

The conversion of CONALEP into a competency based institution actually began previous to the *Project for the Modernization of Technical Education and Training*. In fact, since 1992 CONALEP had been familiar with the world trend toward competency based education and training but had not taken firm steps to implement it. Teaching materials for career programmes had been collected but it was not clear how the approach might be implemented in formal educational programmes in view of the fact that these programmes are subject to official approval and students subject to traditional assessment procedures.

In CONALEP the Pilot Project was implemented as from September 1994, while the formal document was still in the process of being approved, so as to try out the competency based training in a realistic context, study its implications and identify possible obstacles to its general application. Although the Pilot Project was being developed with reference to short training courses, from the beginning in the College it was implemented in career courses because work had already begun along that line before the Project began to be formulated.

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20 *Programa Institucional 1995 – 2000*, p.18
To begin the experiment several competency models were analyzed such as those of Canada, the United States and Great Britain, and some of their programmes were adapted for use in the College using as a reference point labour competencies developed and defined for those countries. Due to the speed with which the pilot project had to be got under way, Conalep translated teaching materials into Spanish—some from Oklahoma, USA, and others from Quebec, Canada.

It was proposed to experiment with the model in 49 of the 260 campuses of the College which offered between one and ten careers each but it was finally applied in only 6 campuses in a total of 8 careers: Fiscal accounting, Information Technology, Industrial electronics, Hotel management, Machine tools, Internal combustion engines, Executive assistant and Electrical Mechanic.

These careers were chosen due to demand from the productive sector, the demand of students and the availability of experienced teachers.

The first training programme in competencies was that of Executive Assistant with basic abilities in Information Technology which had been developed and was being implemented by the end of 1995. The programme covered 340 hours and was divided into five modules. The significance of this course was that it was the first course based on competencies offered by the Secretariat of Work and Social Provision through the PROBECAT programme for unemployed. In this programme in 1996 the College trained more than 800 people in 40 courses.

Another advance in the implementation of competency based education and training made in the College, also at the end of 1995, was the application of the Microsoft competency exams in 15 campuses to students of the first two semesters of the career of Information Technology. Between December 1995 and July 1997, 36,084 students were trained. But the important thing here was not so much the training per se as the experience gained in training at private enterprise levels.

In May of 1995 the first year of the experiment was evaluated with the following general results:

• small coverage in terms of campuses—only 6 of a total of 260;
• the career programmes adapted from other countries did not include all the subjects of the curriculum for training technicians
which had been registered with the SEP and which were necessary for a student to be awarded his/her professional qualification;

• just one campus concentrated 80% of the students involved in the pilot project;

• there was little interest on the part of students to participate in the pilot project – probably due to insufficient promotion and to the lack of clarity as to how a competency award would be compatible with the traditional professional qualification awarded by the Federal Secretariat of Public Education (SEP).

The second phase of the pilot project began with the participation of 13 campuses as from September of 1995 in 9 career areas: Executive assistant, Electro-mechanics, Industrial electronics, Food and Beverages, Hotel Management, Car Mechanic, Industrial Processes and Telecommunications.

Despite the fact that the Project was at first limited to short training programmes offered by the College, right from the beginning there was a certain ambiguity concerning the real differences between the training aspects of the three-year career programmes and training courses.

At the same time, in the Institutional Programme 1995-2000 the College had foreseen the need to implement a number of actions concerning career programmes which dovetailed with the modernization Project. These had to do principally with developing a new academic model, with curriculum development and with teacher training.

As a result of wide consultations all over the country in which federal, State and municipal authorities participated, as well as representatives of industry and academics (about 7000 people in all) it was decided to progressively reduce the number of careers offered by the College from 146 to 29. Once these had been consolidated, and responding to a real demand and firm commitment of material support from industry leaders, 10 regional careers were opened. Actually, of the total of 39 careers, 30 are industrial and 9 are service area careers.

The curriculum structure of the careers was modified with the inclusion of basic formation subjects such as mathematics, Spanish, information technology, physics, history, values and English, obligatory for all students. The curriculum content of mathematics and spanish was strengthened. In support of this change 21 new textbooks were written by experts
from different universities and institutions of investigation. Programmes were designed to support teachers using the new textbooks.

Study programmes for all careers consist of two parts – basic formation and specific career formation. While the importance of competency based training was recognized for the career content, it was also recognized that students should graduate with a dominion of core competencies which, while they cannot be directly identified with specific subjects, are nevertheless promoted by the study of those subjects.

The careers programmes actually have a duration of approximately 3000 hours distributed over 6 semesters. Of this time 30% corresponds to the area of basic formation and 70% to competency based career formation.

The first year of the Pilot Project had shown that it was not sufficient to simply adopt and adapt competency based programmes from other countries. The adaptation could only be done within certain parameters before a radical transformation of the programme would be necessary so as to make it more relevant to local cultural conditions.

To address the problem of a lack of adequate study programmes, and following the general indications of the Project document, the College organized expert panels with the participation of representatives from industry and the educational sector so as to help identify and define labour market needs, identify and define work responsibilities for productive processes, the responsibility level and the identification and definition of work competencies necessary for curriculum design. There was a clear emphasis on incorporating the productive sector into the educational and training process. Curriculum reform would not be relevant without that involvement.

The expert panels had the clear objective of defining occupational functions with reference to the points of view of specialists from the productive and educational sectors so as to design a career programme congruent with the needs of the labour market. A specific functional analysis of occupations was not possible at this time.

The results of the expert panels were important for beginning to think through curriculum in competency terms. The curricula of all

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29 careers were revamped: content was re-elaborated; a modular structure was developed; sequencing of content was redeveloped; and practice sessions were more thoroughly designed.

Parallel to these developments in curriculum, from 1996 during the second phase of the pilot project a greater emphasis was placed on working with teachers to help them develop ways of promoting self-learning and a new teaching strategy so that the student be the prime mover of his/her own training.

The teachers had to be aware that competency based education and training needs facilitators and someone to orient students and promote learning activities, instead of someone to expound and explain. The teacher/instructor, with the support of the campus, would also have to be a promoter of fomenting close relationships with industry so that the students be able to accumulate practical work experience as they study.

This different approach at first gave more emphasis to learning than to teaching. Nevertheless, in the case of teachers working in the competency based pilot project, they were given courses in basic thought processes, group dynamics, assessment of competencies, teaching and learning strategies, and human development (which would later include neurolinguistic programming).

**EVALUATION OF THE PILOT PROJECT IN CONALEP**

So as to evaluate the implementation of the pilot project in Conalep a study was done of a selection of 584 students, 10 directors of campuses participating in the project, 20 teachers/instructors and 9 local coordinators of the Project.

As was to be expected, the critical points of the project were that it had been begun without clear criteria and rules to identify and define labour competencies and the fact that the project had to adapt, at short notice, curriculum from other latitudes, without being able to make them more relevant to the mexican context.

Looking back on the experience from the perspective of the later developments of competency based education and training in the College, we can appreciate that the experience of the pilot project helped us realize the complementarity of career formation and short training courses.
One did not have to be a clairvoyant to see that what was being proposed by the *Project for the Modernization of Technical Education and Training*, despite the fact that it was oriented principally to training in the workplace, would in fact have profound implications for the formation of students in formal careers and not just for people in short training courses.

Nevertheless, once the Modernization Project got under way experience showed that the distinction between education and training was not always a clear one and that not only short training courses could be based on competencies. Training instructors who, in many instances, were also teachers of subjects in the formal career programmes in the participating institutions also began to make connections between education and training.

The process of curriculum development was rationalized saving time, money and energy developing modules structured into a career programme while, at the same time, capable of being used as independent training courses. Personnel was trained in a valuable hands-on experience of curriculum development.

Functional analysis proved to be an indispensable tool for the identification of competencies and the development of technical norms of labour competencies. The results of this work were used to develop, with the help of industry, norms of the educational institution as an important input to the formulation of official technical norms of labour competencies promulgated by CONOCER.

And the involvement of the productive sector was critical in the strengthening of CONALEP-industry Committees which would play a key role in this process by means of the identification of training needs, establishing processes for the permanent up-dating of curriculum content, and strengthening practical training in the workplace for career students.

**Generalization of the Competency Model**

In 1998 the process to extend the competency approach to all career programmes was begun on the basis of the accumulated experience of the pilot project and close collaboration with CONOCER in the development of labour competencies and the evaluation and certification processes.
The importation of programme materials commented earlier only made more urgent the need to speed up the process of forming CONALEP personnel in competency based curriculum design and to develop the College's own materials.

The College needed technical assistance in this area and, after having studied and experimented with the British, Canadian and North American systems, decided to look further abroad for support in human resource development in this area. Finally, the University of Technology Sydney and Technical and Further Education, New South Wales (Australia) were the driving forces that, over a period of several years, trained CONALEP personnel and constructively criticised successive attempts at curriculum development.

Modular training programmes were developed, practical and participative, which were continually up-dated due to the participation of CONALEP in the Committees established by CONOCER to write up the national norms. So far 300 competency based training modules have been developed in industrial and service areas.

The development of training modules helped consolidate the methodology used by the College to develop competency based programmes from needs detection to evaluation.

It also permitted the standardization of training services, in terms of content and competency levels, offered in individual campuses and the definition of a portfolio of training courses. The greater emphasis on training courses was reflected in the yearly increase in the number of people who were trained and which jumped from 64,256 in 1995 to 119,840 in 1998.

During this same process, the College has been experimenting with diverse teacher training programmes based on competencies. The process has been similar to that of curriculum development whereby the College began by adapting programmes from other institutions so as to eventually develop its own more relevant to the specific conditions and objectives of the College. From 1996 to 1999 more than 8,000 teachers have participated in these programmes.

Actually, on the basis of teacher competencies which the College defined in 1999 an on-line teacher training programme is being imparted with the participation of 3000 teachers.
CONALEP is working towards the unification of the formal school career formation, which must fulfill the norms of the Federal Secretariat of Public Education and short training courses so as to minimize entry restrictions and promote life-long learning.

In achieving this objective CONALEP will contribute a new element to how education is understood in Mexico emphasizing the transferability between formal and informal education as well as between formation and training, such that students in a formal programme, the unemployed and workers can aspire to the certification of their competencies through mechanisms established by CONOCER.

It should open the way to the development of more flexible delivery systems such that people who accredit training modules might be able to opt for the completion of the academic requirements for a professional award.

The adoption and adaptation of the competency based model has generated profound changes in the organization of CONALEP, from the creation of a specialized area in 1996 to take charge of the pilot project to the extension of the model to career formation.

**FUTURE CHALLENGES**

The competency model developed by CONALEP for career students has tried to combine academic and career subjects. Being of a more practical nature, it has been easier to conceptualize the career subjects in terms of competencies.

What has become patent in this process is the difficulty of conceptualizing academic subjects in terms of core competencies (Spanish, mathematics, computation, English, values, physics and history) and teaching them as such. Part of the difficulty is the course content set by the Secretariat of Public Education which the students must study.

An important advance has been in the development of competency based career modules to be used both in the formal career formation mode and the training mode so as to create the conditions for transferability between modes, although the transferability is subject to academic conditions which limit the possibilities of an easy transfer between modes.
While candidates can take and accredit a training course on the basis of their basic education (three years of secondary schooling), they cannot be admitted to a career course without having achieved a specific level in an entry exam and fulfil normal school requirements. While theoretically the career programmes are open to anybody who can accumulate the required number of training modules and complement them with the basic formation subjects, in practice there is little real demand for this option.

Another question which will soon have to be addressed is the relation between competency awards and a professional qualification.

Professional qualifications are emitted by the Secretariat of Public Education and are an official recognition not only that the person has attained a specified level of education but also that he/she is qualified to exercise a specific profession. The Secretariat maintains an official register of all people authorized to exercise a specific profession in the country.

While a competency award is a useful parameter for industry, it is not clear how that parameter might be reconciled with official policy concerning the exercise of professions.

Finally, it should be recognized that the implementation of competency based technical education and training in Mexico was largely a government sponsored initiative which, at the time, had not been broadly supported by industry.

While this situation is slowly changing, it must be recognized that many companies still do not have a very clear understanding of labour competencies and their importance. The third component of the Modernization Project needs to emphasized whereby industry be much more fully involved in the process not only of defining competencies but also in the educational process to achieve them.

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Competency-based training in Australia

Josie Misko and Chris Robinson

Introduction

In Australia there are over 1.5 million people enrolled in publicly funded vocational education and training programs each year. This represents over 12% of the entire Australian population aged 15-64 years. This number has grown rapidly during the 1990s from just under one million vocational students at the beginning of the decade.

Over 250,000 of these people are in apprenticeships or traineeships, that is a structured training arrangement involving a formal contract of training with an employer. The remainder are engaged in training activities ranging from basic vocational education to highly advanced technician and technical training.

People can enrol in a vocational education training program simply to gain skills from one or more modules (i.e. subjects or elements of a course) or they can undertake a full program (i.e. full course) leading to a certificate or diploma-level qualification. This training can be undertaken in programs offered by a range of registered training organisations (RTOs) including public Technical and Further Education (TAFE) institutes (i.e. post-school technical colleges), community-based training providers, private and industry training providers and some secondary schools.

Most vocational education and training participants are part-time students. Although the average (in 1997) was 207 hours per student, half of all vocational education and training participants were enrolled in programs of under 100 hours of training. Only around 10% of Australia’s vocational education and training students are undertaking a course as full-time, full-year students. Students over the age of 25 undertake fewer hours per year, on average, than younger students. The proportion of female students in vocational education and training in Australia has now reached almost 50%.
The proportion of Australia's vocational education and training students who are of school age, early secondary school leavers or entry-level trainees is relatively small. Only 20% of all vocational education and training students are under 20 years of age, although they account for one-third of the total training hours delivered.

Most vocational education and training participants are adults who are training or re-training for job-related purposes. One quarter of all vocational education and training participants in Australia are over 40 years of age.

In fact in Australia a vocational education and training student is far more likely to be an adult who is already employed and upgrading his or her job skills, than a young person who is studying in vocational education and training to gain an entry level qualification.

In terms of the different age groups, the participation rates in vocational education and training in 1997 were:

- nearly 20% for 15 to 19 year olds
- 17% for 20 to 24 year olds
- nearly 7% for 25 to 64 year olds.

These figures do not include participation in other forms of education such as in schools and universities.

The structure of the Australian vocational educational and training system is described in more detail in Smith A (1998), Robinson C (1999a) and Alto et al. (2000).

**The historical context of competency-based training in Australia**

Against this backdrop, a comprehensive approach to competency-based training (CBT) was introduced into the Australian vocational education and training system in the late 1980s.

As pointed out by Harris et al. (1995), CBT had been practised in some forms prior to this time. However, it was not until the late 1980s that the current comprehensive approach to CBT was adopted in Australia.
As in many other countries, it was recognised that better approaches to skill formation would become an increasingly important ‘driver’ of the economy. There was a strong perception at the time that vocational education and training was not sufficiently responsive to meeting the needs of industry, with too much emphasis on the ‘supply side’. The latter being a view that vocational education and training provision was largely being determined by what programs training providers wished to run.

Training reform was considered to be the vehicle through which to develop skilled and flexible workers to take their place in new workplaces and industries focussed on value-adding to products and services. Training reform included the linking of training, skills and wages. It was to be achieved via a national and cohesive approach to vocational education and training predicated on the widespread adoption of CBT.

**A decade of CBT**

There is no one exact definition of CBT in the literature. However most educators, researchers, and policy makers agree that competency-based training is training that is based on outcomes and pre-determined standards. That is, it is training which is based on what students can do rather than on what courses they have done. In a CBT system the performance of students is judged according to objective standards. In Australia and other countries that have adopted CBT, these standards are related to ‘realistic practices’ in the workplace (ANTA 1998).

From the beginning of the 1990s CBT has been the cornerstone of Australia’s vocational education and training system. CBT was developed with the view of ensuring that vocational education and training was very clearly linked to the technical competencies required in the workplace. A detailed and comprehensive account of the introduction of CBT in Australia is given in Smith X (1999) and Smith and Keating (1997).

The development of CBT in Australia involved the implementation of assessment strategies which were based on nationally consistent industry or enterprise-specific competency standards, and delivered national qualifications which were portable and recognisable across the nation. The performance of students was to be judged according to these objective standards rather than in comparison with the performance of other
students. Training and assessment strategies were to be responsive to the needs of industry and trainees and students. This meant that they were to be able to choose, when, where and how they would undertake their training and when and how they would undertake their assessment. The training market was opened up to allow private operators to deliver training that in the past had been only provided by colleges of the major public provider TAFE (Technical and Further Education). Recognition of prior learning processes were introduced to recognise competencies that had already been achieved. CBT was also based on a modular approach to training. This meant that trainees and students could step in and out of the training system to acquire skills as they required them.

A system based on industry competency standards required the identification and formulation of these standards. This was to be undertaken by Competency-Standards Bodies which represented appropriate industry interests. In February 1990 a National Training Board (NTB) was set up to approve and disseminate these national competency standards. In November 1990 a memorandum of understanding was signed by all State and Territory governments (i.e. provincial governments) to undertake the implementation of vocational education and training according to these nationally approved competency standards. These nationally approved standards formed the basis of national curricula. The NTB also drew up an eight level framework to link competencies attained to qualifications and to levels in occupations. This was known as the Australian Standards Framework (ASF). A target date for the 'substantial' implementation of CBT was set for December 1993.

In 1992 the Australian National Training Authority (ANTA) was established. It became operational on January 1 1994. It was established to prepare a national strategy for vocational education and training, and to report on outcomes. It was responsible for developing the national training framework, advising on the distribution of the national government's funds, reviewing policy, and undertaking evaluation and research on national priorities. It was also to play a leading and critical role in designing and further developing the Australian vocational education and training system so that it would continue to be responsive to industry and individual needs and provide a unified standards approach to skill development. The ANTA Board is made up of leading industry representatives to guarantee that the training system was centred on the needs of industry.
APPEASING THE CRITICS

The NTB's early concept of competency and standards was considered to be too narrow. It was criticised by educators and researchers for promoting a view of competence that was based on behaviourist principles which had little regard for the underpinning knowledge, values and attitudes that were considered to be essential for the development of skill and expertise. These same groups complained that competency standards were related to the attainment of narrow and short-term industry objectives, rather than to the attainment of long term skill development or educational achievement (Jackson 1992, Brown 1992).

Other researchers also raised concerns that overly prescriptive views of competency, prescribed by industry standards, might not recognise the importance of knowing what, how and why certain actions are to be taken, and how to apply this knowledge to a variety of situations. The CBT paradigm was also considered by others to be fragmented and to ignore the interrelationships between the different tasks performed in an occupation (Hager 1993, Blunden 1996). CBT was felt to ignore the ways that students go about their learning. Some researchers argued that the modular approach to training, failed to take into account the time required for students to practise skills, and to reflect on their learning so that information could be stored in long-term memory (e.g. Cornford 1997). In addition because the system was perceived to focus on how to go about performing a task, some others argued that CBT ignored the importance of skills which would help individuals to diagnose the root causes of problems and develop strategies for their solution (e.g. Stevenson 1992).

The NTB took these criticisms on board and expanded its definition of competency to include the knowledge, value and attitudes that should be addressed by the standards. Also included was a guide to the evidence that would be required to indicate knowledge and understanding and statements about the ranges of situations that this competency would apply to. There were also concerns about assessment and particularly about the selection of those who were to make judgments (assessors) about whether or not standards had been achieved.

In effect the major criticisms about CBT revolved around the ability of the approach to develop skilled and flexible workers, or its ability to
develop the deep-level learning which would empower individuals to be able to make an informed and positive contribution to society and to the workplace (Ryan 1997, Stevenson 1992, 1995).

**THE ALLEN REVIEW**

A review of the early implementation of CBT by the Allen Consulting Group (1994) commissioned by the Australian National Training Authority, found that there had been little progress in implementing the new reforms particularly in some industry sectors. In fact it was felt that the reforms had not been implemented according to the requirements established in the competency standards that had been allocated to implementing the reforms. There had been little practical uptake by training providers and employers.

The Allen Review found that although employers were in favour of a training system based on industry competencies, many were concerned that the standards were too prescriptive and prevented enterprises from interpreting the standards according to their own contexts. The review also found that training providers wanted the same flexibility so that they could develop modules and programs more quickly. The Review concluded that what was required were national competency frameworks rather than detailed prescriptions of competency standards (p43).

It also became evident that industry had not participated in the implementation of the new reforms. The review suggested a number of initiatives to increase the participation of industry. One initiative related to increasing the role of the individual client or enterprise in making decisions about training content, and the selection of training providers. This would then help to shift the emphasis away from a supply-driven or top-down approach to training delivery (decisions made by training providers and government authorities) to a demand-driven approach (decisions made by individual users and enterprises) and would further open up the training market.

Another policy initiative related to the recognition of training. The (ASF) initiated by the NTB had failed to provide a systematic and unambiguous approach to linking training and competencies achieved to qualifications. What was proposed was a new Qualifications Framework.
CREATING A NEW FRAMEWORK

The National Training Framework (NTF) was subsequently established. This incorporated the packaging of competency standards for different qualifications, and arrangements made for the recognition of training. A new Australian Qualifications Framework (AQF) was established in 1995 and arrangements for the national recognition of qualifications or competencies attained were put in place. The new AQF included six different core vocational education and training qualifications being offered under a new comprehensive national system of education and training qualifications that encompassed university and senior school qualifications as well as vocational qualifications. They are shown in table 1. A seventh qualification, the senior secondary certificate, is also offered by some TAFE institutes. In addition, under the AQF a 'statement of attainment' may be issued for partial completion of a full qualification. The AQF was progressively phased in over a five year period ending 31 December 1999.

The AQF was designed to provide consistent recognition of the outcomes achieved from education and training across all sectors of senior secondary schooling and universities. The AQF includes recognition of the integration of learning in the workplace with the incorporation of structured training into the system (with apprenticeships and traineeships being Certificates I to IV under the AQF). Moreover, the AQF was designed to provide a clear and rational structure in which an increasingly de-regulated training market can operate while maintaining credibility within the overall education and training system.

The AQF qualifications can be attained in various ways. These include:

- through the classroom in a TAFE or other registered vocational education and training provider as a full or part-time student
- in the workplace through a structured training program
- in an industry training centre
- through 'off-campus' modes of study such as open or distance learning
- through various combinations of the above.

The AQF system in the vocational education and training sector is designed around a set of competency standards that need to be achieved
in different training programs, rather than qualifications being set according to the amount of time taken to undertake a course of study. Thus, different people will take different amounts of time to complete any given qualification. Nevertheless, the typical intensity of each AQF qualification is as follows:

- Certificate I and Certificate II programs are the equivalent of around half a year of full-time study to complete
- Certificate III and Certificate IV programs typically take the equivalent of one year or full-time study to complete
- Diploma and Advanced Diploma programs typically involve the equivalent of two years of full-time study, although some programs involve the equivalent of three years of full-time study.

As stated above this process was commenced in 1995. An Australian Qualifications Framework Advisory Board was established to oversee the implementation of the AQF across all education and training sectors. In the vocational education and training sector, the NTB was incorporated
CoMPETENCY-BASED TRAINING IN ANTA and its role taken over by the Standards and Curriculum Council which in turn was subsequently taken over by the National Training Framework Committee. The role of the Committee was to develop and oversee (in Australia the term *oversight* is used by government departments) the National Training Framework (NTF). Under the NTF the Training Packages became the new reference points for industry or enterprise-specific competency standards. Training packages became the 'road map' to link national industry competency standards to the different vocational qualification under the AQF for each industry.

The NTF's notion of competency continued to include all forms of work-place skills involved in the performance of specific tasks (task skills), the management of a range of tasks (task management skills) responses to non-routine tasks (contingency-management skills) and carrying out specific responsibilities (job/role environment skills). Competency standards were to continue to act as assessment benchmarks and incorporate detailed Evidence Guides to support the assessment of competency in these four components and to describe in appropriate detail the knowledge, value and attitudes that underpinned the competency. The qualifications of assessors, the ways in which to acquire these, and assessor training that is available were also provided under the Framework.

In part these guidelines then were a response to some of the critics who were concerned that CBT had ignored the importance of underpinning knowledge, skills and attitudes, or the importance of the development of strategies to deal with non-routine problems or contingencies.

**MODIFYING THE REGULATIONS**

The NTF aimed to develop a more flexible and industry-relevant regulatory environment. This meant that national VET qualifications were to be decided by industry bodies rather than through accreditation of courses by State Training Authorities. Providers of training and assessment were to be registered with State Training Authorities and this registration allowed them to become registered training organisations (RTOs) and thereby to engage in training, assessment and the issuing of qualifications and statements of attainment. All organisations that wanted their products or
services to be recognised had to be so registered or operate in partnership with an RTO who would then become responsible for guaranteeing the quality of the products or services provided by their partner organisations. Qualifications and statements of attainment would be recognised across states and territories. Continuing registration for RTOs was to be attained through their compliance with audit requirements of their relevant recognition authority.

**Opening up the training market**

Over the 1990s the roll-out of CBT has been accompanied by an opening up of the national training market. Whereas during earlier periods almost all publicly-funded vocational education and training was delivered by TAFE colleges or other public training providers, by the late 1990s significant numbers of non-government training providers were operating in the Australian training market as providers of publicly-funded training programs.

For instance, vocational education and training programs in 1997 were provided by:

- around 100 TAFE or other government institutes (such as agricultural colleges and universities providing vocational education and training programs) operating at some 1,000 separate locations around Australia.
- some 600 community-based education centres
- almost 1,500 other registered training providers such as private training organisations, schools, business enterprises who provide formal training, special industry training centres, etc.

Nevertheless it is important to note that public providers continue to be the major players in the training market. Private and community-based training providers deliver vocational education and training programs to just over 20% of all vocational students and trainees, but account for only 10% of all the training hours delivered.
Increasingly greater amounts of public funding are put up for com­petitive tendering amongst TAFE, community-based and private training providers. It is important to note that there are over 3,500 registered training organisations in Australia, so not all of them are providing publicly-funded vocational education and training programs in any one year.

In 1997 arrangements were also put in place to allow more discretion for individual clients and their employers who had entered into a contract of training (apprenticeship, traineeship) to select their own training provider. These arrangements were made possible by the implementation of the User Choice program. Under this program public funds flowed to those RTOs who had been chosen by employers and trainees to deliver the training.

Under User Choice arrangements employers and trainees may also choose how the traineeships will be delivered. They may opt for training to occur totally on the job or to choose a mixture of on and off-the-job training.

**INTRODUCING TRAINING PACKAGES**

One way to customise training to the needs of industries and to minimise the use of overly prescriptive competency standards was to give industry the opportunity to incorporate competency standards, qualifications and ways of measuring skills into one package or formal document. This package is called a Training Package. It describes competencies, assessment guidelines and qualifications for a particular industry or enterprise. These components must be endorsed. It may also include non-endorsed components which describe learning strategies, assessment resources and professional development materials.

By March 2000 there were 51 formally endorsed Training Packages (Training Packages ANTA 2000). These comprised 47 industry packages and 4 enterprise packages. According to ANTA they covered about 85% of Australian Industry. At the time of writing there were another 15 training packages that were waiting to be endorsed. The packages that have been endorsed have been grouped according to industry sectors in Table 2.
### Table 2: Training Packages endorsed by November 1999

<table>
<thead>
<tr>
<th>Industry Sector</th>
<th>Endorsed Training Package</th>
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<tbody>
<tr>
<td>AGRICULTURE, FORESTRY AND FISHING</td>
<td>AGRICULTURE</td>
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<td></td>
<td>FORESTRY AND FOREST PRODUCTS</td>
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<td>HORTICULTURE</td>
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<td>VETERINARY NURSING</td>
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<td>MINING</td>
<td>BLACK COAL</td>
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<td></td>
<td>EXTRACTIVE INDUSTRIES</td>
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<td></td>
<td>DRILLING</td>
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<tr>
<td>MANUFACTURING</td>
<td>MANUFACTURED MINERAL PRODUCTS</td>
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<td></td>
<td>METAL AND ENGINEERING</td>
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<td></td>
<td>PLASTICS, RUBBER AND CABLE-MAKING</td>
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<td>MEAT</td>
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<td>FOOD</td>
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<td>SEAFOOD</td>
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<td></td>
<td>PULP AND PAPER</td>
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<td></td>
<td>CHEMICAL, HYDROCARBONS AND OIL REFINING</td>
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<tr>
<td>ELECTRICITY, GAS AND WATER SUPPLY</td>
<td>ELECTRO-TECHNOLOGY</td>
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<td>UTILITIES-GAS SECTOR</td>
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<td>UTILITIES-GENERATION SECTOR</td>
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<td>UTILITIES-WATER SECTOR</td>
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<td>UTILITIES-TRANSMISSION SECTOR</td>
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<td>CONSTRUCTION</td>
<td>CIVIL CONSTRUCTION</td>
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<td>GENERAL CONSTRUCTION</td>
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<tr>
<td>WHOLESALE AND RETAIL TRADE</td>
<td>WOOLWORTHS (ENTERPRISE) RETAIL</td>
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<tr>
<td>ACCOMMODATION, CAFE &amp; RESTAURANT</td>
<td>HOSPITALITY</td>
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<td>CARAVAN</td>
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<td>TRANSPORT AND STORAGE</td>
<td>TRANSPORT AND DISTRIBUTION</td>
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<td>AEROSKILLS</td>
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<td></td>
<td>AUTOMOTIVE RETAIL SERVICE AND REPAIR</td>
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<tr>
<td>COMMUNICATION SERVICES</td>
<td>TELECOMMUNICATIONS</td>
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<td></td>
<td>INFORMATION TECHNOLOGY</td>
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<td></td>
<td>MUSEUM AND LIBRARY INFORMATION SERVICES</td>
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<td></td>
<td>PRINTING AND GRAPHIC ARTS INDUSTRY</td>
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<tr>
<td>FINANCE AND INSURANCE</td>
<td>FINANCIAL SERVICES</td>
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<td>PROPERTY AND BUSINESS SERVICES</td>
<td>ASSET MAINTENANCE</td>
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<td></td>
<td>ASSET SECURITY</td>
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<td></td>
<td>SERVICE TECHNICIAN PORTABLE FIRE EQUIPMENT (CHUBB FIRE – ENTERPRISE)</td>
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<td></td>
<td>ADMINISTRATION</td>
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<td>LIFTS</td>
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### Table 2: Training Packages endorsed by November 1999 (continuación)

<table>
<thead>
<tr>
<th>Government Administration and Defence</th>
<th>Public Services</th>
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<tbody>
<tr>
<td>Education</td>
<td>Assessment and Workplace Training</td>
</tr>
<tr>
<td>Health and Community Services</td>
<td>Community Services</td>
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<tr>
<td>Cultural and Recreational Services</td>
<td>Entertainment Industry</td>
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<td></td>
<td>Outdoor Recreation</td>
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<td>P &amp; O Ports (Enterprise)</td>
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<td>Racing</td>
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<td>Personal and Other Services</td>
<td>Beauty</td>
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<td>Floristry</td>
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<tr>
<td>Cross Industry Training Package</td>
<td>Laboratory Operations</td>
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**Continuing Issues in Assessment:**
**Encouraging the Use of RPL**

The roll-out of CBT in Australia was associated with the move of arrangements for recognition of prior learning (RPL). RPL was introduced to minimise the need to repeat training in skills or knowledge that had already been attained. Such strategies would be especially useful for existing workers who wanted to be recognised for their competency in a particular occupation or industry. Bateman (1998) reported findings from a Victorian study which showed that although most providers had in place strategies for the recognition of prior learning there was minimal use of this pathway to qualifications or recognition of competency. The Victorian study concluded that the failure of individuals and organisation to take up RPL options was due to the lack of appreciation among providers and individuals of the benefits of assessment as a recognition and qualifications pathway. Another reason why clients may not take up the RPL option is that a module that is granted through RPL still carries the same fees as one in which training is provided. This may stop clients from applying for this form of
assessment. Another reason may be that the preparation of evidence required for RPL may require more work that actual attendance at the class.

Assessment centres were advocated as a way to provide assessment services to industry. Today assessment-only RTOs are available under the National Training Framework. This means that assessors can go into workplaces and conduct, validate and verify assessments. This then solves the problems of not having trained assessors in the workplace.

**INTRODUCING GRADED COMPETENCIES**

Since the incorporation of CBT into vocational education and training courses, there have been concerns raised by teachers and employers about the merits of assessments which do not provide information on how well certain competencies have been demonstrated. There is the school of thought that claims that competent performance already presumes the achievement of a certain standard and that it is a nonsense to speak about different levels of performance. In contrast another school of thought believes that competent performance is only about a minimum standard of performance that must be demonstrated, and that grades can coexist quite effectively with the principles of competency-based assessment.

Concerns have been raised by teachers about the motivation of students to give of their best in an assessment system which does not distinguish between levels of performance (Dickson and Bloch 1999, Billet et al 1999, Thomson et al 1996, Quirk 1995a, Robinson P 1993, Smith 1997, Lundberg 1996). Dickson and Bloch surveyed industry representatives, employers and teachers and found that all three groups were in favour of graded competencies. Industry representatives believed employers wanted to have some evidence of how well an individual student had performed, employers preferred to select on percentage grades, and teachers, trainers and assessors believed that the motivation of students, and particularly good students, would be improved by a system of graded competencies. These findings were also supported Billet et al (1999). They found that teachers, high achieving students, and employers approved of a graded system because grades were easy to understand, and could be used to reward extra effort. These researchers also found that a graded system disadvantaged lower achieving students who had completed the
required work. In a study of industry representatives, public and private training providers, government training agencies, and public and private enterprises, Quirk (1995b) found that these groups favoured the graded assessment of competencies.

Many training providers have responded to employer requests for graded competencies by incorporating levels of performance into their reporting of assessments. However, the issue of whether to grade or not to grade is still to be resolved for many training organisations. Nevertheless the National Training Framework guidelines for developers of Training Packages (ANTA 1998, p.23) state that 'Assessment outcomes may be reported in a variety of ways, including graded, non-graded and descriptive reporting systems'.

**EXERCISING PROFESSIONAL JUDGMENTS**

Teachers have also been concerned that their professional judgments about training and assessment have not been taken into account. This has been especially so for teachers in subject areas like commercial cookery and fashion which had traditionally depended on holistic assessments of finished products. Teachers believed that what they were now being asked to do was to take each step in isolation and tick off competencies as they were achieved rather than look at the finished product as a whole (Robinson P 1993). These findings were also supported by Billet et al (1999) who found that teachers believed there was less ability for them to exercise professional judgment. In addition the move to self-paced study and flexible delivery was also felt to have distanced the teacher from the student and had encouraged them to adopt practices that they did not believe would always work for every student.

More recently however researchers are finding signs of increasing acceptance of CBT among TAFE and non-TAFE providers (Lowrie et al 1999) and increased evidence of instructors relying on professional judgments to modify teaching and learning strategies so that CBT requirements can be put into place (Smith and Lowrie 1997). Strategies have been developed to better deal with the increased time required for administering assessment on demand processes and maintaining extensive record keeping systems. For example the setting up of specialist assessment laborato-
ries, arrangements for multiple assessments across different contexts for the same competency or the combining of learning outcomes within and across modules have all been examples of teachers exercising professional judgments. In addition instructors have also restricted the number of resits that students were able to take in an effort to maintain a basic standard of competency. Realising that arrangements for assessment on demand and self-paced studies would also depend on the maintenance of comprehensive records teachers and administrators have redesigned record systems and appointed administrative staff to deal with the maintenance of records. In addition increased workloads and paperwork required for RPL assessments has led to the development of more detailed applications for RPL to be completed by RPL applicants, and the appointment of RPL specialists.

The CBT focus on flexible delivery and self-paced studies as a way to respond to client needs, and to develop responsibility in students, was soon found by teachers to limit group and peer interaction. To help develop a sense of belonging and an opportunity to learn from others, teachers have structured specific time during the course for group interaction.

The non-endorsed components of the Training Packages will provide increased opportunities for teachers to continue to use their professional judgments and knowledge about teaching and learning in the development of learning materials and assessment resources. They also provide ample opportunities and flexibility for teachers to work with employers in deciding on a training program which will best deliver the competencies identified in the Training Package, and tailoring the training program to meet the needs of individual enterprises and industry contexts.

**WORKPLACE ASSESSMENT**

Researchers from the National Centre for Vocational Education Research (Misko and Saunders 1995) found that the uptake of competency-based training and assessment for existing workers was not widespread. It was especially limited for members of special groups including part-time or casual workers. In part this was because part-time or casual workers were brought in at busy times of the year when there was no time during working hours to allocate to training or assessment. In addition employers did not
want to provide these opportunities for employees who would only be with them for a short time.

This research also showed that where employers had implemented strategies for the recognition of current competencies and wages had been linked to competencies, they reported that these had produced benefits in terms of employee motivation and improved productivity.

Training Packages continue to provide employers with opportunities for their existing workers to have their competencies recognised or undertake training in competencies that have yet to be attained. In addition User Choice arrangements make it possible for existing workers to undertake a contract of training, and to decide in conjunction with their employers on how this training will be delivered and on the provider that will deliver the training. This means that employers may decide to have all training delivered on-site, or decide on a combination of on and off-the-job training. Where employers are unable to conduct their own assessments the National Training Framework has allowed for the registration of Assessment-only RTOs.

**Education or Competence?**

From the beginning, the CBT approach to teaching and learning has been criticised for paying scant attention to developing an 'educated' work force. That is to say that CBT focusses its attention on the technical and interpersonal skills required of workers as identified by industry and employers. Although the competency standards refer to the knowledge, understanding and values that underpin competent performance, there are still many educators who maintain that the system does not address the knowledge, understanding or values required to enable individuals contribute to society in socially productive ways. Stevenson (1992) is especially critical of CBT because he feels that it does not prepare individuals to 'overcome meaninglessness, barbarism or oppression...and pursue goals such as ...wholeness, ability to make judgments or ability to take action to improve or transform society; ...and develop... such values as acceptance of others, reason or freedom' (Stevenson 1992, p216).

It is true that the system does not provide for this type of learning or encourage the development of competency standards for principled
and ethical living. However CBT was never designed to do so. The system was designed to develop the skills and competencies required to help the nation to become more internationally competitive. It has tried to provide a response that ensured that the training focus is on the skills, and competencies required by industry for economic success. These have included the need to develop problem-solving, interpersonal skills and organisational skills required for this. It should not be evaluated on the achievement of educational outcomes that were never intended.

The areas Stevenson identifies are areas of learning which cannot always be accomplished easily in a formal system of general education or industry training (eg primary and secondary schools, vocational training schools, workplaces or community training centres). What Stevenson is talking about is the development in students of a general world view which helps them to understand the need for what he has called ‘principled and prudent’ action and to deploy such action when the need arises. Stevenson is talking about a system where individuals acquire the norms and beliefs of the culture in which they live. This cannot be solely accomplished through a formal education or training system, whether it be based on CBT or on the achievement of learning objectives or outcomes. If we want individuals who are able to make wise and ethical life decisions as well as to successfully perform a range of specific technical and occupational skills, then the messages they receive must be consistent. The messages individuals receive in the home, social and interest groups, schools, other formal learning settings, and in the media should form the foundation for the development in individuals of socially constructive forms of behaviour. Individuals with a range of marketable technical skills but lacking moral principles or consideration for peers may not find fulfillment in a social sense and may in the long run make decisions which are economically risky. However individuals who are highly principled and considerate of others but lack technical skills will also be disadvantaged. The challenge for a society is to develop individuals who are able to develop and deploy marketable technical skills and demonstrate principled and ethical behaviour.

**The way ahead**

Clearly the introduction of CBT has not been without controversy. The debate about whether CBT has been a valuable thing for Australia con-
continues. The various viewpoints in Australia are perhaps best summed up by Ryan (1997) and van Berkel (1997). Ryan (1997) argued that CBT had failed to equip students with the underpinning knowledge and understanding (on higher order thinking skills), focussing far too much on specific technical competencies and tasks. On the other hand van Berkel (1997) argued that CBT was the centre-piece of a series of training reforms that have transformed the vocational education and training sector to ‘help determine how limited public resources should be allocated to best meet the skill requirements of industry and facilitate genuine career opportunities and help facilitate genuine career opportunities for all workers’ (van Berkel 1997 p.23).

The National Centre for Vocational Education Research (NCVER) has recently published a suite of new research reports which take stock of the progress achieved in Australia with CBT (see Billet et al 1999, Dickson & Bloch 1999, Gillis and Bateman 1999, Lowrie et al 1999, Mulcahy and James 1999). A comprehensive review of this and other recent Australian research on the impact of CBT is given in Misko (1999).

The key findings of this research are that CBT has had positive effects of:

- increasing the focus on delivering training which is responsive to the needs of the workplace;
- increasing accessibility and flexibility of training for students and trainees, especially with respect development of training that is broken down into modules (or elements or subjects) and offered to students and trainees in ways which allow them to undertake that training which provides them with specific skills they are seeking. This has allowed Australia to develop a training system with one of the highest rates of formal training for those of 30 years of age in the world. (This is a critical issue as lifelong learning is becoming so important.)
- providing training which is based on national industry or enterprise-specific standards.

On the other hand the research has also identified a number of negative effects. These include:
• a perception of inadequate resourcing to implement CBT, particularly at the initial development stage;
• inadequate preparation of teachers and trainers for the implementation of the reforms associated with CBT;
• a concern that the modularised training available under CBT, together with the implementation of competency-based assessment, has downplayed the importance of underpinning knowledge and understanding in vocational education courses.

The last point in particular is a serious issue that will have to be better addressed in the further development of the Australian training system. With regard to this, there are two critical issues that need to be addressed.

First, it is becoming increasingly apparent that the CBT approach will need to give much more emphasis to the underpinning technical knowledge and understanding that is required in many jobs these days, especially those requiring advanced skills. In some areas at least there is increasing concern that CBT has led to a devaluing of this underpinning knowledge with too much focus on competencies in specific tasks.

Second, and perhaps even more important, is that insufficient attention has been given to generic work skills that are now so important in most jobs.

In his address to the conference of the Lifelong Learning Network in Canberra, Robinson C (1999b) described the context in which education and training systems would need to come up with new responses.

The world is changing fast these days. Globalisation of economies and rapid technological changes critically affect all countries. The education and training systems in all countries have had difficulties in keeping up with the pace of change, yet it is vital that they do so. Some of the key technical skills we will need in 20 years time do not yet exist.

This poses tremendous problems and challenges for the provision of education and training. It is becoming increasingly apparent that many more workers in the new millennium will increasingly need:

• excellent interpersonal and human relations skills to get the best out of people and work well in team-working situations;
• critical analytical and interpretive skills in order to handle and make sense of the enormous amount of information now available;
• to be entrepreneurial and enterprising, irrespective of whether they run a business or work for others as an employee, so that new business opportunities are always being sought (p9).

In the modern workforce generic skills are just as important as any technical, para-professional or professional skills people hold. Developing this more diverse range of skills will require new responses from our education and training systems.

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Competency-based technical education in Costa Rica

ORLANDO M. MORALES

INTRODUCTION

The development of competencies for the labor market in Costa Rica is very recent. It has been born as a consequence of the demand for a new, highly qualified labor force that the national educational authorities visualized. Nowadays, by means of the council of the Integrated National System of Vocational Training for the Competitiveness (SINETEC), new governmental policies have been generated to promote, among the training institutions, the necessary adjustments to curriculum needed to prepare qualified human resources in the technical areas for the country’s needs. Furthermore, it is an interesting fact that a developing country has visualized in the notion of competence for the labor market, a suitable mechanism for developing competitiveness in the present time of commercial globalization and economy liberalization.

On the other hand, Vocational Training Education, at a formal level, is a recent phenomenon in Costa Rica. It was born as an organic process in the last fifty years. In fact, in 1957, the first technical high school (CTP) was officially created, dependent of the Ministry of Public Education (MEP). From 1965 on, the training of qualified workers and basic technicians began with the creation of The National Vocational Training Institute (INA). The INA is an autonomous institution that works with a budget originated from the contribution of 2% of private companies’ general payroll.

There were several exceptions, such as the Vocational High School of Arts and Occupations of Cartago (COVAO), which was started as a welfare institution. It sought through work training a means to overcome poverty, rather than being seen as a key factor for production. Furthermore, before INA’s and the Vocational Training high schools’ creation, a private National Training School made a valuable contribution oriented to training related
directly to production. This school was sponsored by the Chamber of Industry of Costa Rica, under the management of Ing. Rafael Keith.

As a consequence of the late birth of the technical-professional training in Costa Rica, 70% of the student population of secondary school is oriented to academic studies that prepare them for university studies. Only 30% of this population is oriented toward training or learning work oriented skills. This model is in complete opposition to the one followed by developed countries such as Switzerland and Germany and even countries like Taiwan which, to a great extent, have based their growth and economic development on technical training.

All the university institutions of the country, both private and public, offer higher technical careers that leads to a University Diplomado degree after two or three years of studies. However, parauniversity institutions of technical education were created later (like U.S. community colleges), throughout law 6541, published in the official newspaper La Gaceta, on December, 1980. These institutions are dedicated to the training of higher level technicians with a Diplomado degree. In this way, the labor pyramid of technical education consists of three different levels corresponding to basic, intermediate, and high level technicians.

There are also Professional Institutions for Education of the Community, known as IPEC, a type of community High School. These institutions offer education to young people and adults, by fulfilling their basic needs and interests and giving an educational opportunity with versatile training programs. These training programs are based on the demand of the market or personal interest, and they provide an opportunity for those students who are not part of the formal educational system. However, it is quite common to find people who are looking for training at the IPEC, in order to have a job to assure better living conditions, a type of education for all as UNESCO proclaims.

The labor market tendency in Costa Rica is passing through a transformation from an agricultural and intensive labor model to one that is based on the manufacturing and service sectors. The Government is still one of the highest employment sources in spite of state reform that has led to the reduction of the government payroll. Likewise, the in rural areas, most of the jobs are poorly paid due to the poor added value they provide.
Fortunately, the present Administration (1998-2002) is promoting a rural development program that seeks the diversification of the technical-professional activities in the provincial areas as a mechanism to provide new options of professional training for people who lead and will generate new productive activities in those regions. Then, with these programs, the Administration is trying to diminish the existing urban-rural differences with the possibility of the settlement of companies that demand qualified labor hand in the rural areas. Certainly, the existence of standards of labor performance will facilitate their certification processes, with a better integration of the labor force into the new economy and greater satisfaction regarding their performance.

The purpose of this article is to provide information on the technical education that is offered in Costa Rica, in order to understand the process of introduction of competencies for the labor market. More particularly we consider this topic in the framework of an under developed country and specially, the introduction of Standards of Competence into the technical Education system. (EBNC) taking advantage of the model of the Colegio Nacional de Educación Profesional Técnica (CONALEP) of Mexico.

**COSTA RICA: A PARADOXICAL COUNTRY**

Once, someone called Costa Rica “the country of paradox” since it is has been a democracy for one hundred years in a region of political turmoil, and one with sound recognized achievements in health, education and environmental issues, even though it has a traditional productive model. Due to this fact, Costa Rica has been ranked between 30 and 40 in terms of development during the nineties, which means it is in the upper quarter of the countries in the world in recent years, according to the Human Development’s Report, published by the Program of the United Nations for the Development (PNUD). In fact, even though Costa Rica is located in Central America, an area convulsed by social and economic chaos that had led to civil wars and popular disagreement and revolt, the country has high standard of health and education comparable to those of industrialized countries, in aspects such as life expectancy, and infant mortality. The level of illiteracy has decreased to 5% at the same time that computer literacy is rising. There is an evident emphasis on increasing the school
retention rate and, at the same time, stimulating computer science in primary and secondary schools.

The abolition of the army 50 years ago, the quality of life and its natural beauties, as well as its centenarian democracy, contribute to make of Costa Rica a tourist destiny for more than a million foreign visitors every year. The importance that tourism has gained in recent years is noticeable; to a degree that it has taken the place of agricultural products as a foreign currency generator.

During the last decade, the settlement of high technology companies in the different industrial parks, under the free zone system, especially in the Central Valley, has brought an emphasis on a higher quality professional technical education. In brief, it may be we are witnessing the step from a banana republic into a technology country.

Reform of the public sector, largely ignored during the 80's, became stronger in the last decade and was conceived as a need for efficiency, through decentralization and transference of functions to the private sector. This has been achieved through a policy of subsidisation, mixed banking, electric co-generation, and legislation to give public works in concessions to private entities. A discussion related to the opening of the telecommunication market and its control mechanisms is taking place in the Congress at this moment. This has provoked both great expectancy and anxiety among the populace which is against privatization and also has a tepid position toward the opening of international markets.

**CREATION OF THE NATIONAL INTEGRATED SYSTEM OF TECHNICAL EDUCATION FOR COMPETITIVENESS (SINETEC)**

For some time the different institutions that have been involved in the training of technical human resources have been working independently with occasional contacts through some cooperative agreements among them. The need to have an articulation mechanism among these entities to accomplish a more efficient and productive management of the Technical Education and Professional Training, led to the development of a structure to establish effective inter-institutional coordination.

This concept of systematic organization developed in the present administration, was originated from a conceptual outline generated in the
Technological Institute of Costa Rica (ITCR), which is a prestigious university level institution. In the present Administration, for the period 1998-2002, and based on Executive Decree No. 271131MP-PLAN, of June 19, 1998, SINETEC was created, based on the following considerations.

The requirements of the productive sector in terms of quantity, excellence, and diversity at the highest technical-professional resources, is very demanding. Until now it has been in the charge of many public and private institutions with few links and poor coordination among them.

The willingness to stimulate technical training as a mechanism for quickly training human resources in areas of high demand and increasing salaries. All these are part of a process seeking to break the vicious poverty circle and take steps to create innovative social programs. The aim is a fast incorporation of human resources into the labor market, through training and school programs developed between providers and employers.

The policy of the Government to modernise the productive sector, and particularly to promote high technology, as a means of achieving international competitiveness and of participating with advantage in globalization.

The willingness to pay attention to vocational interests and contribute to the solution of social problems, requires a system that increases training programs or careers demanded by the productive sector. At the same time, there is a need to encourage, together with the management sector, the training of technical enterprise minded people through inter-institutional means, both public and private, using flexible mechanisms of accreditation.

The conviction that within the multiple intelligence theory, youngsters should be given the opportunity to be involved in different educational activities which develop psychomotor fine skill, as well as cognitive and creative capacities. Thus education should provide an opportunity for self-improvement as well as supporting the productive sector since the fast technological development demands new technical knowledge.

There is the need for technical curriculum which provides both horizontal and vertical articulation. The former to obtain the best use of resources and the latter to enable students to move up the educational ladder to university technological education.

The relative functional independence and the lack of coordination among institutions, makes it necessary to develop articulation agreements
to obtain the most from the available resources. These agreements should allow for the recognition of the acquired knowledge through certification and accreditation processes by providing certified skill competencies for the labor market. In this process, women and people with disabilities have to be included under equal conditions, with the corresponding curricular adjustments.

The need to have a superior mechanism of inter-institutional coordination that works on the efficiency of the training of technical-professional human resources, extends the technical base of the country and fulfills the present and future training needs by including a basic, intermediate and high level of technical education, as an organic and systematic unit coming from the diversity.

For such reasons, and given the existing commitment to fulfill the purpose established in the National Plan of Development 1998-2000, the National Integrated System for Technical Education was set into motion.

It is a coordination mechanism which aims to improve the efficiency and effectiveness of the public and private institutions, involved in technical education, with horizontal articulation and vertical integration. All these by means of programs that assure the quantity, quality, and professional diversity required at present and in the future.

The members of the system will be those state organisms in charge of the training and improvement of technical level human resources: Basic (INA), Intermediate (Technical Professional High Schools) and High (Community Colleges and Universities), particularly, the Technological Institute of Costa Rica (ITCR), which is engaged according to its institutional mission of improving this sector.

It will also include those private institutions that are willing to participate voluntarily or those that have to do it because the present legislation demands it.

Since the vision of the system is to develop technical education as an essential element of economic competitiveness, different ministries are also involved. Education, Labor, Commerce and Industry, Science and Technology and Agriculture will be component parts of the system. On the other hand, the chambers of the productive sector will also be a part since they required highly qualified technical resource to increase productivity.
Finally, a strategy is required to increase not only the level of technical education, (from the most basic level to the highest, together with plans that promote investments through high technology industries and the chambers of the productive sector), but also to value, from a social perspective, these types of work oriented programs.

The SINETEC establishes policies through a high level Council composed of the leaders of the participating institutions which come from the government sector, the training institutions, the productive and the labor sector. The preparation of the proposals that the SINETEC Council deals with and the execution of the agreements, correspond to the second level denominated Technical Committee. This Committee is composed of the highest technical management leaders in order to assure the execution of the agreements. The different *ad hoc* working committees supply the inputs the Technical Committee requires, and later, will carry out the actions derived from the approval of the agreements or proposal by the council, under the surveillance of the Technical Committee. Therefore, the SINETEC is, from a functional perspective, a simple structure; however, it is complex in the sense that the different institutions need to establish effective communicative channels for the accomplishment of their objectives.

Competence-based technical education

The following section examines the antecedents of labor market competencies in three institutions: The National Vocational Training Institution (INA), the Center of Research and Improvement for Technical Education (CIPET) and the Technical-Professional High Schools (CTP) in Costa Rica.

*Pioneering work of National Vocational Training Institute (INA)*

Since 1996, the National Vocational Training Institution (INA), with the support of the International Work Organization (OIT, Turin), has based its vocational education program on Standards of Competencies for the Labor Market (EBNC) in the Tourism Center. It took the Center a period of about three years to get to point of offering the different professional training programs in areas such as the Hotel Industry and Gastronomy. Detailed information about this subject has been outlined in the compilation called “Teaching-Learning based on Standards of Competencies for the
Labor Market," published by the SINETEC in 1999. The following is a brief account on it.

The ambitious project was called the "National System of Normalization, Training and Certification based on Standards of Competencies for the Labor Market for the Tourism Center". It was carried out together with the International Center of the OIT in Turin, Italy. During 1996, a series of preparatory conferences took place. These were delivered by experts on this new method of instruction that was becoming stronger in the industrialized countries of Europe, North America and Oceania (Australia and New Zealand).

Fortunately, at the beginning of 1997, the INA's Board of Directors, decided to incorporate, as an institutional policy, three key factors: the Normalization, the Training, and the Certification of competencies for the labor market. The Tourism Center was chosen to start this methodological innovation, a break from the old paradigm of curriculum based on the views of teachers and schools.

In spite of the initial success, the other INA sectors have been moving slowly in order to adapt the new teaching methodology to the wide range of programs they offer. At present, the institution can count on meaningful written information based on experiences that allowed the execution of the project and will facilitate the subsequent programs in other areas.

It is important to mention that since 1997, and by decision of the superior collegiate level, the Boards of Directors agreed to extend the Tourism Center's pilot project to the other Centers of instructional training. The process has been advancing slowly but there is, however, a willingness to accelerate it.

The INA has great possibilities of development such as the Certification Unit which serves the needs of unskilled workers in need of certification. However, this Unit lacks standards for labor performance which have been validated, and only certifies the people's theory-practical know-how that was acquired by a self-teaching process or as a result of experience. Also, it is restricted to certificate, by means of experience, of its own graduates. This is due to the fact that there are no agreed competency standards in many areas.

Likewise, the Accreditation Unit, which has been certified with ISO 9002, has approved procedures that assure the quality of the services hired
in the case of outsourcing. It undertakes the recognition of the teaching work of other institutions, not only public but also private, perform by using the seal of certified confidence given by INA.

*Experience of the Center of Research and Improvement for Technical Education (CIPET)*

This institution belongs to the Ministry of Public Education and corresponds to a parauniversity level. It has the faculty to issue Aptitude and Suitability certificates, as well as Teachers’ degrees in Technical Education to qualify people for teaching in the Technical-Professional High Schools and other similar institutions.

By the end of 1997, and through the pedagogical leadership of the College Bois de Bologne (B de B), Montreal, Quebec, it began the training project, by applying the competence method. It was addressed to three specialties: computer sciences accounting and electrotechnics.

Such an applied experience began by the end of 1997 with the first training for the staff and the studies on planning, in the specialty of accounting. In the first months of 1998, the analysis of the work situation was carried out.

Up to now, the process continues. Instructors from technical-professional schools that offer the specialty of accounting have been trained, as well as the teachers of the specialty and two CIPET officers, who participated in an assistantship about the methodology applied in the classroom in the B de B.

Moreover, seminars about competence-base technical education have taken place with the support of Dutch experts in the agricultural field (1999), and recently, CIPET organized, an introductory seminar on the subject of competencies for the labor market for Central America (2000).

*Implementation of the CBT as a Teaching-Learning Model in Technical-Professional High Schools*

The implementation process of the EBNC in the technical-professional high schools of the country can be divided in three phases:
• Preparatory, by means of conferences and introductory seminars.
• Learning of methodological instruments targeted to possible participants.
• Immersion in the operative process addressed to teachers of the involved institutions.

In spite of the fact that since 1995 there has been a cooperative agreement between CONALEP and a Technical High School in Costa Rica, COVAO in Cartago, it was not until the year 2000 that education based on the new paradigm of competencies began, under the impetus and coordination of SINETEC.

It can be said that a significant event that empowered the project was the signed "Cooperative Agreement in the subject of Technical Education, between the Secretary of Education of the United States of Mexico and the Ministry of Education of Costa Rica." It was signed on January 15th, 1999 and it was part of the ceremonies in which President Zedillo Ponce de León, of Mexico and President Rodríguez Echeverría of Costa Rica participated. Such agreement was organized by both the coordination of SINETEC and the Direction of CONALEP.

The purpose throughout this agreement was to take advantage of the experience of CONALEP, and carry out the transference of technological education concerned with EBNC. It was seen as a mechanism for assuring the quality of the technical education and professional training for the benefit of the institutions that are members of the SINETEC.

Under the CONALEP agreement the donation of a curricular package was possible for the two technical specialties to be developed in three technical-professional schools (COVAO, Diurnal and Nocturnal and the CTP Jesús Ocaña, of Alajuela): Automechanic in the first two, and Precision Mechanic, throughout the EBNC system as a pilot project.

The following is a detailed description of the route followed for more than one year by SINETEC in order to implement the courses.

**Phase I: Preparatory Activities**

1. In November, 1998 on occasion of the First National Congress on Technical Education and Professional Training, we had the opportu-
nity to invite a special guest, speaker, Lic. Antonio Argüelles, Director General of the CONALEP. Mr. Argüelles discoursed on the subject of competence-based technical education; and his lecture was very motivating and, above all, promoted the new paradigm of change. He argued that this approach would provide, to the productive sector in a period of change, human resources of high technical level within a flexible model. Before an audience composed by professors and instructors, not only from INA but also from the CTP, members of the productive sector and some others from the labor sector, the lecture can be considered as an introduction to a relatively new subject for much of the audience. In the seminar there was the participation of the three sectors: the state, represented by professors of the training institutions; members of the chambers and employers representing the productive sector, and the labor sector that was also invited and represented by the cooperative and solidarity movement, the last one a kind of employers-employee union.

In December of the same year, a three-day seminar took place in the Cultural Center of Mexico. This seminar was addressed to directors of training institutions due to the fact that it was that sector that showed most interest. This interest was mainly based on the consequences of a new educational paradigm for technical education; and not necessarily because of the consequences in the production or business competitiveness.

The next step was to encourage the employers. To achieve this goal, a seminar was prepared in the Hotel Parque del Lago, and at the presidium were the Vice-ministers of Education, Economy, Industry and Commerce. The emphasis was focused on the importance of integrating the employers in the processes of creation of competence standards for the labor market. This was seen as a basic input, for the elaboration of programs with the job profile required by the different productive sectors. Likewise, an emphasis was given to the need of making the employers aware of the fact that, even for a technical-professional degree the elaboration of labour market competencies is the best way of assuring the suitability of the degree for the development of human resources and, as a consequence, employment.
On December 18th, 1998, the Council of SINETEC, in a meeting at the Presidential House, approved the institutions, members of the System of Technical Education and Professional Training to participation in this new teaching-learning paradigm based on standards of competencies and on the certification of the competencies for the labor market. This process will mean a break with the traditional teaching model. It will also force the creation of standards and, necessarily, to an integration among workers, training entities, and representatives from the companies. Likewise, it will lead to a certification device for competencies for the labor market as a mechanism of assuring the quality of practical performance in both manufacturing and services.

At the beginning of 1999, in the meeting with the Council of the Union of Chambers and Companies of the Private Sector, the advantages of the standardization and certification of the competencies for the labor market was explained. It was suggested it was vital to the competitiveness of the companies, through the development of human resources with the required knowledge, attitude, and skills for the different practical activities the sector demands.

**Phase II: Methodological Instrumentation**

With the third seminar given by the specialists of CONALEP, the second stage commenced. This activity was targeted at administrative workers of the institutions members of the SINETEC, corresponding to the Integral Administrative Model (MAI), with the purpose of incorporating procedures that lead to an administrative model of excellence. Such event took place in the Wilchez Auditorium of INA, and counted with the participation administrative officers of INA, Technical-Professional High Schools, University Schools, National Council of Rectors and the Department of Technical Education of the Ministry of Public Education.

The fourth Seminar had as a main objective the development of a training program for instructors, by putting into practice the concepts of competencies for the labor market. It was an obligatory requirement to have experience or knowledge on curricular programming. The search for leaders to conduct the process was in progress.
To conclude the second stage of this process, there was a fifth seminar targeted to the instructors of the different human resources training institutions, at a technical level. This seminar pursued the objective of developing teaching strategies that put into practice the programs based on standards of competence. Therefore, a deep analysis on the curriculum was undertaken.

**PHASE III: IMMERSION INTO OPERATIVE PROCESS**

The third stage corresponded to specific events exclusively addressed to the high schools COVAO, diurnal and nocturnal, in Cartago, and Jesús Ocaña, in Alajuela. These were the ones committed to implement the model. It would be in these institutions where the pilot project of EBNC was developed. In this workshop only the instructors of these places participated. It started with a seminar that became the sixth event. It consisted of training in curricular design, based on standards of competencies. The main purpose was to adapt the CONALEP programs to the Costa Rican reality.

By means of a week assistantship, leader instructors of the participating institutions of Costa Rica had the opportunity to know *in situ*, the management of this methodology in the CONALEP, in Mexico City. It was an enriching experience that allowed the instructors to obtain valuable documentation and field trips. Thanks to the generosity of the receptor institution, they could come back with the plans and programs under the EBNC methodology for two careers, donated by CONALEP.

According to what was planned, it was necessary to carry out a consultancy, in two final stages by the end of 1999 and the beginning of the year 2000. This consultancy was addressed to instructors of both Technical High Schools and administrative personnel that were involved in the project. It was also necessary to clarify the immediate doubts to put the program under way.

Finally, the last event on February 2000, ended the process of training for the instructors of those careers which plans and programs will be developed under the EBNC methodology.

It is important to point out that the first stage, as well as the second one, were very stimulating and instructors participated actively. In the
third stage, however, which consisted on the implementation of the pilot experience, problems began in the sense that the theory had been assimilated but many were reluctant become involved in practice. There was some resistance to implement the new model. Regarding this last aspect, I believe it is fundamental to plan for overcome this reluctance in order to break the traditional old models and adopt the emergent paradigm of the EBNC.

Finally, the process' culmination took place when the Council of Higher Education (CSE), the highest and only organism that approves the plans and programs of the Public Education in Costa Rica, resolved on January 11, 2000, through a firm agreement and unanimity, the following resolutoory text:

"To approve the request of pilot project of Education based on Standards of Competence in the specialties of Automechanic and Precision Mechanic to be developed in the Vocational High School of Arts and Occupations (COVAO) and the Technical-Professional High School Jesús Ocaña.

To approve this project as an educational experience of didactical nature, framed within the standards that are established by the document named Regulation of Evaluation of the Learning.

The development of this experience should be applied during the school year period pointed out by the Regulation of Evaluation of the Learning.

The Ministry of Public Education, throughout the Department of Technical Education, will provide annual reports on the development of this project and a final evaluation will be mandatory at the three years of application of the experience."

From this date on, the teaching-learning process based on standards of competence in two specialties, in three Technical High Schools of the country, is officially approved.

**Final Observations**

This short experience of about fifteen months, represented a clear demonstration of the constant struggle between educational orthodoxy and innovation in educational thinking and practice. There is a need to recognize that educational innovation is difficult and that individuals seem to be naturally conservative and resistant to change.
In our case, the attempt to get engage a wide target population was difficult. The understanding of the new system did increase exponentially but at the same time, through a screening process, the number of participants were decreasing. It seems to be reasonable to think about choosing a leader team from the very first moment, instead of involving large numbers of educators as occurred in this case. We have to take into account that not all participants were effectively motivated to continue.

Another mistake in the procedure was that the higher authorities, in this case the members of Council of Higher Education, were informed along the procedure, but not strictly involved until the final stage. This led to the approval of a very innovative proposal in some aspects, but inserted in the old evaluation regime. Hence the old approach of years of study and distinct subjects was not immediately replaced programs corresponding to certifiable labour competencies. The result was an intermediate model, a compromise version that lost some essential elements for the sake of an early execution in the school year of 2000.

Based on the experience of the introduction of the EBNC model in Costa Rica, the following is recommended:

Our experience suggests that it is better to have a team leader, a group of people strongly convinced, rather than a multitudinary group of people that is not really engaged with putting the new knowledge into practice—even when they are interested at all times. This will have the advantage of not wasting efforts in a general population and will allowed a more personalized instruction to clarify the doubts that appear during the process for the group chosen.

The process could be conceived one able to be implemented at a fast, gradual, or slow pace. We prefer to believe that the faster, the better. In this way there is no time for a “counteroffensive” coming from the status quo representatives, or from the members of the orthodoxy. In other words, a period of from six months to a year should be enough to execute the experience of a pilot project of Education based on Standards of Competence. The advantages of the methodology will be proven with the improved products to convince the non-believers.

Coordinated work involving different sectors is the best way forward. We can see it in the Government institutions such as The Ministry of Labor and Welfare, the Ministry of Economy, Industry and Commerce,
and the Ministry of Education. All of them are concerned with the training of human resources, in the field of Technical Education and Professional Training. In a very important way, we also included the Private Sector, represented by the chambers of the productive sector, and representatives of the Labor Sector: Cooperatives and Unions.

However, what is important is the presence of a locomotive force that pulls the other railroad cars. This means, that sometimes it is better to have a responsible institution that leads with the support of others, rather than sharing responsibilities, where it is difficult to agree who has the ultimate responsibility.

It is also convenient that the hierarchy that has the power of approving the new methodology, provides signs of approval before the process is completed, and at the same time, facilitates the human, physical and financial resources. It is important not to run the risk of having a group preparing a proposal that does not have the approval of the corresponding authorities of the sector.

In Latin America, it is well known that there is an asymmetry in the wideness of the gap between the group in charge of policies and the technical group, which in some cases, does not make possible the implementation of the innovation.

The expert consultancy is an indispensable means for ensuring a good outcome. While a group of educators can work through the problems and come to solutions, a good consultant can reduce the learning curve. It is also valuable to have as a reference, in theory and practical subjects, the experience of an institution that offers this service. Without the generous and highly qualified cooperation of CONALEP, it would not be possible to accomplish this challenge.

Written material is essential for developing an understanding of the new concept and for considering alternatives. The SINETEC published an interesting reference compilation called "Teaching–Learning based on Standards of Competence" with that purpose. Likewise, the CONALEP facilitated several documents that were part of its evolution toward the EBNC implementation. This is an enriching material for those who are interested in the subject and to the collaborators we are most grateful.

Finally, the process of introducing competency based education should be considered a joint trilogy, between training, standardization of
norms, and certification of competencies for the labor market. Therefore, it is not enough to have a process of Education based on Standards of Competence; an extra effort should be made in order to validate norms and obtain the performance standards. This is a process in which personnel of the Private Sector and the hierarchies of the training institutions should participate in as a joint venture.

**EPILOGUE:**

In the case of Costa Rica, it has been proposed that an Executive Decree to set the foundation of a National Council of Standardization and Certification of the Standards of Competencies known as CONOCETE be enacted. This decree is characterized by its simplicity, but we are confident of its efficiency. As usual, a Council of high level would dictate the policies to a technical body, under the supervision and responsibility of a general manager. Both functional technical units would be the Standardization and the Certification Offices, organized throughout specific work groups according to the demand.

Nowadays, the Interamerican Development Bank (BID) is studying a request for a non-reimbursable loan, in order to start up a National System of Standardization and Certification of the Competencies for the Labor Market in the technical-professional sector, inspired mostly on the model of the Council of Standardization and Certification (CONOCER) of Mexico.
Les diplômes de l'enseignement technique en France: construction et usage d'un compromis

ÉDITH KIRSCH

Le diplôme national sanctionnant une formation initiale est dominant dans le système de certification professionnelle français. Il garde une forte valeur symbolique pour les individus et possède une fonction de signal sur le marché du travail. L’essentiel de ce texte lui sera donc consacré. Après avoir présenté l'architecture générale du système, nous nous intéresserons à la définition du contenu des diplômes à finalité professionnelle puis à leur utilisation au moment de la formation et de l'évaluation. Enfin, nous évoquerons en conclusion les éléments qui sont actuellement en débat et susceptibles d'évoluer.

UN SYSTÈME DE FORMATION PROFESSIONNELLE DOMINÉ PAR L'ÉCOLE

Bien que l'on affirme qu'il est désormais nécessaire de se former tout au long de la vie, il est exceptionnel en France que les parcours professionnels soient conçus comme une alternance entre travail et formation. La formation professionnelle initiale domine dans la construction de la qualification. Elle est dispensée soit par la voie scolaire et universitaire, soit par l'apprentissage, la première restant très majoritaire dans l'accès aux diplômes.

ENSEIGNEMENT TECHNOLOGIQUE, ENSEIGNEMENT PROFESSIONNEL

L'architecture générale du système des diplômes français et les liaisons entre diplômes sont représentées au tableau 1. En 1999, la population scolaire et universitaire totale était en France de 15 millions d'élèves, tous âges et tous niveaux confondus. Environ 30 % de ces jeunes se trouvaient dans le second cycle de l'enseignement secondaire (2 300 000 en 1999)
ou dans l'enseignement supérieur (2 100 000). L'orientation vers les formations conduisant aux diplômes professionnels n'intervient généralement qu'à la fin du premier cycle de l'enseignement secondaire, c'est à dire au plus tôt vers 15 ans. Les élèves se répartissent alors dans trois types de filières: générales (46 %), technologiques (19 %) ou professionnelles (35 %)\(^1\) (Éducation nationale, 1999). L'enseignement technologique "a pour objet de dispenser une formation générale de haut niveau" et inclut "l'acquisition de connaissances et de compétences technologiques et professionnelles". Il conduit au baccalauréat technologique et peut permettre "l'accès direct à la vie active". L'enseignement professionnel est principalement organisé "en vue de l'exercice d'un métier" et "peut permettre de poursuivre une formation ultérieure"; il associe "à la formation générale un haut niveau de connaissances techniques spécialisées"\(^2\). Il conduit au baccalauréat professionnel, accessible après un Brevet d'Études Professionnelles.

Le baccalauréat sanctionne les études secondaires mais il est le premier grade de l'enseignement supérieur: tous les bacheliers peuvent donc accéder à cet enseignement. C'est le cas pour la quasi-totalité des bacheliers généraux et pour 80 % des bacheliers technologiques. La proportion de bacheliers professionnels s'engageant dans des études supérieures n'est que de 17 %. Bien que tout soit théoriquement possible, le type de baccalauréat obtenu détermine la nature des études supérieures choisies. Un baccalauréat général conduit neuf fois sur dix vers l'Université alors que les bacheliers technologiques et professionnels se dirigent plutôt vers l'enseignement supérieur court.

Par enseignement supérieur court, nous désignons des formations professionnalisées d'une durée de deux ans après le baccalauréat. Les plus importantes sont le Brevet de Technicien Supérieur (BTS) et le Diplôme Universitaire de Technologie (DUT). Le BTS est plus spécialisé que le DUT.

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\(^1\) Sauf mention contraire, les données chiffrées citées dans ce texte sont extraites de "Reperes et références statistiques sur les enseignements, la formation et la recherche". Paris, Ministère de l'Éducation nationale, de la Recherche et de la Technologie, Direction de la Programmation et du développement. 1999.

\(^2\) Les citations sont extraites de la loi programme sur l'enseignement technique et professionnel du 23 décembre 1985, Titre II, "L'enseignement technologique et professionnel du second degré ".

**Tableau 1. L'architecture des diplômes en France**

<table>
<thead>
<tr>
<th>Enseignement supérieur long (3 ans et au-delà): Licence, Maîtrise, Doctorat, Diplômes spécialisés Universités, Grandes écoles</th>
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</thead>
<tbody>
<tr>
<td><strong>Vie professionnelle</strong></td>
</tr>
<tr>
<td>Enseignement supérieur court (2 ans): BTS (Lycées), DUT (Universités)</td>
</tr>
<tr>
<td>Baccalauréat général</td>
</tr>
<tr>
<td>Baccalauréat technologique</td>
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<tr>
<td>Brevets spécialisés</td>
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<tr>
<td>Baccalauréat professionnel (2 ans)</td>
</tr>
<tr>
<td>Brevet professionnel (Apprentissage ou formation continue)</td>
</tr>
<tr>
<td>CAP (1 à 3 ans selon scolarité antérieure)</td>
</tr>
<tr>
<td>BEP (2 ans)</td>
</tr>
</tbody>
</table>

**Premier cycle de l'enseignement secondaire:**
Enseignement général pendant 4 ans à partir de 11 ans

*Lecture du graphique: Le noir représente le cas le plus fréquent, le gris l'exception. Les flèches indiquent les possibilités de circulation entre les filières conduisant aux diplômes du second cycle et de l'enseignement supérieur.*

Il est construit de la même manière que les diplômes de l'enseignement secondaire alors que la définition des contenus de formation des DUT est beaucoup plus souple. Le BTS se prépare dans les lycées, le DUT dans les Instituts Universitaires de Technologie (IUT) qui dépendent des universités. Les étudiants préparant un BTS sont deux fois plus nombreux que ceux qui préparent un DUT (respectivement 234 000 et 111 000). L'accès aux deux filières se fait sur dossier mais les IUT sont plus sélectifs. De plus la préparation en lycée donne au BTS l'apparence d'une continuité avec l'enseignement secondaire qui rassure probablement beaucoup de jeunes.
Cela étant, on peut s’interroger sur la pérennité de ce système du fait de la création très récente des licences professionnelles qui se préparent en trois ans dans les universités: certains craignent déjà qu’elles concurrencent les deux diplômes.

**Retarder l'entrée sur le marché du travail**

Une caractéristique importante de la situation française est que la plupart des diplômes permettent à la fois l'entrée dans la vie professionnelle et la poursuite d'études. Il est possible de cheminer "verticalement" et "horizontalement" à l'intérieur du système éducatif à tous les niveaux, sous réserve que les résultats scolaires le permettent. L'ensemble des possibilités de circulation entre filières est représentée au tableau 1. Les responsables du système éducatif insistent sur leur volonté de ne pas enfermer les jeunes dans des voies trop limitatives afin de leur permettre d'atteindre le niveau de formation le plus élevé possible. Ces passerelles donnent également une "seconde chance" à certains élèves car l'orientation vers l'enseignement professionnel résulte rarement d'un choix positif. Le baccalauréat professionnel illustre parfaitement cette volonté de ne pas fermer les possibilités de progression puisqu'il est ouvert principalement aux titulaires de brevets d'études professionnelles (BEP) qui, auparavant étaient "condamnés" à aller sur le marché du travail.

Un autre facteur incitant à prolonger ses études est qu’il est plus facile d’obtenir un diplôme par la voie scolaire. Selon les diplômes, les taux de réussite aux examens de l’enseignement technologique et professionnel concernant les lycéens sont supérieurs de 5 à 12 points à ceux des apprentis et de 11 à 25 points à ceux des adultes préparant le diplôme en formation continue⁵. Les résultats les plus défavorables aux non scolaires concernent le Brevet de Technicien Supérieur où les candidats qui se partagent entre le travail et les études sont probablement désavantagés car ils disposent de moins de temps pour assimiler les mêmes programmes de formation. Cela peut se révéler difficile dans certaines disciplines théoriques lorsque

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⁵ Les taux de réussite aux examens varient selon les diplômes. Le taux le plus bas concerne le BTS (63 %), le taux le plus élevé le CAP (73 %).
les apprenants ne reçoivent pas une aide suffisante des enseignants ou des maîtres d'apprentissage pour faire le lien entre la théorie et la pratique. Ce type de problème ne se pose pas en Allemagne où l'implication des entreprises dans la formation par alternance est plus forte et où formation initiale et formation continue ne conduisent pas aux mêmes diplômes.

La difficulté ou la réticence à faire très tôt un choix professionnel joue probablement contre le développement de l'apprentissage. Le contrat d'apprentissage est un contrat de travail où alternent des périodes en centre de formation et en entreprise. Il exclut théoriquement le retour au lycée. Continuer à se former ne peut donc se faire que dans le cadre d'un nouveau contrat d'apprentissage ou par la formation continue. Alors que depuis 1987 tous les diplômes français peuvent être préparés par la filière de l'apprentissage, ce mode de formation reste minoritaire. En 1999, on comptait 360 000 apprentis en France, c'est à dire à peine le dixième de la population potentiellement concernée par ce type de formation. Près de 75 % des apprentis préparent un CAP ou un BEP, 15 % un baccalauréat professionnel ou un brevet professionnel. Les formations postérieures au baccalauréat ne représentent que 10 % des effectifs totaux d'apprentis dont 7 % pour le BTS.

Rester le plus longtemps possible à l'école est surtout un moyen d'éviter le chômage. En mars 1998, 16 % des jeunes ayant achevé leurs études depuis environ cinq ans étaient au chômage. Ce chiffre moyen recouvre de fortes disparités selon le niveau : il est de 7 % après des études supérieures, de 18 % après des études secondaires et de 37 % pour ceux qui n'ont aucun diplôme (Éducation nationale, 1999). La dernière enquête du Céreq (1999) montre que les jeunes sans formation professionnelle initiale sont presque les seuls à rester très longtemps sans emploi : 22 mois en moyenne contre 12 mois au maximum pour les autres niveaux de formation. Réussir à l'examen se révèle également important : à niveau équivalent, les jeunes qui ont obtenu leur diplôme ont une situation professionnelle plus stable et occupent des emplois plus qualifiés que ceux qui ont échoué. Enfin, le type de diplôme possédé influe fortement sur le niveau de rémunération.

4 Le CAP et le BEP sont les premiers niveaux de la qualification ouvrière, le bac professionnel et le brevet professionnel concerne plutôt des ouvriers hautement qualifiés, des techniciens d'ateliers et des agents de maîtrise.
et la carrière professionnelle et les écarts ne font que s'accentuer au fil du temps. Dans ces conditions, il y a consensus entre les individus et les pouvoirs publics pour différer l'entrée sur un marché du travail défavorable tout en élévant le niveau de qualification de la population.

Nous avons vu qu'il est plus facile d'obtenir un diplôme avant d'entrer sur le marché du travail, mais il faut ajouter que c'est également plus rentable. Les grilles de classification salariales négociées par les organisations patronales et syndicales de chaque branche font référence, depuis le début des années soixante-dix, à des critères classants parmi lesquels figure le diplôme, à condition qu'il ait été obtenu avant l'entrée dans l'entreprise. Cela signifie que les titres obtenus par la formation continue ne donnent pas systématiquement droit à une promotion (Jobert et Tallard, 1995). De plus, les pratiques de recrutement des entreprises accordent toujours beaucoup d'importance au diplôme acquis en formation initiale.

Ainsi, qu'il s'agisse des caractéristiques des diplômes, des règles de gestion de la main d'œuvre dans les entreprises ou de leurs pratiques de recrutement, tout concourt en France à valoriser la formation initiale. Cela contribue à allonger artificiellement la durée des études et joue contre le développement d'une alternance entre périodes de travail et périodes de formation au cours de la vie professionnelle.

**LA CONSTRUCTION DES DIPLOMES**

La construction des diplômes et titres professionnels est un processus à la fois complexe et formalisé qui repose sur une série de compromis entre des acteurs dont les systèmes de référence, les intérêts, les modes de fonctionnement sont divers et parfois très éloignés les uns des autres. Cette remarque vaut pour les diplômes gérés par l'Éducation nationale, pour ceux qui dépendent du ministère de l'Agriculture et pour les titres du ministère de l'Emploi et de la Solidarité. Après avoir présenté les modalités de construction des diplômes et les acteurs impliqués dans ce processus, nous évoquerons les points sur lesquels ils doivent parvenir à un consensus. Nous étudierons enfin les conséquences des compromis passés. L'analyse sera centrée sur les diplômes de l'Éducation nationale qui sont très majoritaires en France.
**Encadré 1**

**Un système très administré, mais en mouvement**

Malgré sa complexité et la lourdeur des procédures administratives qui le régissent, le système d’enseignement professionnel français est loin d’être rigide et statique. Les diplômes sont actualisés tous les cinq ans environ, sauf avis contraire des professionnels et leur évolution reflète à la fois les transformations économiques et les besoins de la population. Ainsi, depuis trente ans, l’offre de formation professionnelle initiale au niveau du baccalauréat et de l’enseignement supérieur court a beaucoup augmenté tandis que celle qui prépare à des emplois d’ouvriers de l’industrie a diminué. En même temps, le nombre de diplômes concernant les activités artisanales et, surtout, les services a progressé (Kirsch, 1997a et 1998). Le Certificat d’Aptitude Professionnelle semble jouer actuellement pour de nouvelles activités de service comme la médiation sociale ou la sécurité des biens et des personnes le rôle de professionnalisation qu’il a joué autrefois pour l’industrie. D’une manière générale, les évolutions confirment le rôle des diplômes dans la construction de l’identité des professions et témoignent de l’émergence de nouvelles préoccupations sociales. Les élèves préparant des diplômes du tertiaire sont plus nombreux (56 %) dans les lycées professionnels de l’Education nationale que ceux qui se destinent à l’industrie. Les spécialités drainant les effectifs les plus forts sont le commerce, la comptabilité et le secrétariat qui représentent à elles trois 38 % des effectifs formés. Dans l’industrie, deux groupes de formation dominent: électricité, électronique et automatismes (18 %) d’un côté, métallurgie et mécanique de l’autre (12 %).

Le clivage entre industrie et services est moins pertinent pour l’apprentissage. Ce mode de formation est traditionnellement ancré dans l’artisanat et les petites entreprises. Le cinquième, environ, des apprentis se forment dans la restauration et l’hôtellerie. Un autre secteur recourant largement à l’apprentissage est le bâtiment (18 % des apprentis). À la différence de ce que l’on observe dans les lycées, la part des apprentis en mécanique est plus importante (15 %) que celle des apprentis en électricité - électronique (8 %). L’apprentissage dans le secteur tertiaire se développe depuis que ce mode de formation est accessible aux diplômes supérieur au CAP.

**Les étapes du processus**

En France, le contenu des diplômes de l’enseignement technique est défini dans des référentiels qui résultent d’une négociation où deux acteurs dominent: l’État et les employeurs. Leur élaboration se fait pour l’essentiel
dans des instances paritaires, les Commissions professionnelles consultatives (CPC), selon une méthodologie définie par le Ministère de l'Éducation nationale. Le temps nécessaire à la création d'un diplôme est d'environ un an à un an et demi.

**LE TRAITEMENT DES DEMANDES DE CRÉATION DE DIPLOME**

Les demandes de création de diplômes émanent le plus souvent d'organisations professionnelles d'employeurs, quelquefois de grandes entreprises. L'Éducation nationale, notamment le Secrétariat général des CPC, peut prendre l'initiative d'un projet lorsque la profession concernée n'est pas suffisamment structurée ou tarde trop à lancer une rénovation de diplôme. Toute nouvelle mise en chantier doit être justifiée par un "dossier d'opportunité de création de diplôme" qui comporte des informations à la fois quantitatives et qualitatives sur l'emploi (caractéristiques et évolution), sur les formations existantes proches du champ professionnel visé et sur les possibilités d'insertion professionnelle dans les branches concernées. Des analyses qualitatives sur les activités de travail sont en principe indispensables pour connaître les performances attendues des futurs diplômés mais, lorsqu'elles existent, les descriptions produites ne sont pas toujours très approfondies. Le dossier d'opportunité est en effet plus ou moins formalisé; il peut être très différent quant à son style et à son contenu selon le savoir-faire des demandeurs et les ressources logistiques dont ils disposent. Les branches professionnelles les plus puissantes sont souvent mieux armées pour le construire que l'artisanat ou des professions en émergence. Les études préalables les plus fouillées sont celles qui sont réalisées par des experts (organismes de recherche ou consultants) à la demande du ministère de l'Éducation nationale. Les conclusions des études préalables à la création des diplômes sont discutées dans les Commissions professionnelles consultatives compétentes (voir encadré 2). Les travaux commencent après accord de la CPC et durent en moyenne un an et demi. Leur objectif est d'établir les documents de référence qui fondent la validité nationale du diplôme et lui confèrent son caractère de norme.
Les diplômes de l'enseignement technique en France

Encadré 2

Les Commissions professionnelles consultatives
Les Commissions professionnelles consultatives (CPC) sont des instances quadripartites composées de représentants des pouvoirs publics, des employeurs, des salariés et de personnes qualifiées dans le domaine professionnel concerné. Elles se prononcent sur "la définition, le contenu et l'évolution des formations dans les branches professionnelles relevant de leur compétences" (décret du 4 juillet 1972). Dix-sept CPC fonctionnent actuellement. Leur présidence est assurée alternativement par un employeur et par un salarié. La programmation, l'organisation de leur travail, leur suivi et leur appui technique sont assurés par un Secrétariat général rattaché au ministère de l'Éducation nationale.

Le référentiel des activités professionnelles

Le premier document élaboré en CPC est le référentiel des activités professionnelles (RAP) qui définit la cible professionnelle du diplôme. Il est structuré selon un schéma prescrit présenté dans l'encadré 3. Les activités décrites ne doivent pas se limiter à celles d'un débutant mais doivent tenir compte de la diversité des possibilités d'insertion professionnelle et des processus d'adaptation à l'emploi. Les diplômes de l'enseignement technique ne sont donc construits ni en vue d'une efficience immédiate, ni par référence non plus à un poste de travail spécifique.

Le référentiel de certification

Après le RAP est élaboré le référentiel de certification qui définit les exigences du diplôme en précisant les conditions dans lesquelles se fera l'évaluation: critères de performance, limites de ce qui sera exigé du candidat. Ce référentiel liste les performances attendues sur le plan professionnel et les connaissances correspondantes (Voir infra, Tableau 2, partie "Référentiel de certification du baccalauréat professionnel Secrétariat"). C'est le document de référence le plus important pour les différents partenaires concernés par le diplôme car, déterminant les normes de l'évaluation, il sert également de base à la définition des programmes de formation.
**Encadré 3**

**Schéma théorique du Référentiel des activités professionnelles**

**Champ d’activité**
Défini par trois rubriques:

- *résumé* des finalités du travail, des situations professionnelles auxquelles correspond le diplôme;
- *contexte professionnel*: situe concrètement l’activité dans les entreprises et les secteurs économiques, décrit le milieu physique dans lequel se déroule l’activité et ses conditions de travail...
- *délimitation et pondération des activités*: précise la situation fonctionnelle des activités et leur importance.

**Description des activités**

- **Les fonctions**: Renvoient à l’organisation et à la structure des entreprises (accueil, production, qualité, logistique du transport, vente...). Les fonctions essentielles peuvent être brièvement décrites.
- **Les tâches**: Description de ce que fait la personne dans le cadre de chacune des fonctions sous l’angle de ce qui est *prescrit*, de ce qui est attendu par l’organisation.
- **Les conditions d’exercice de l’activité**:
  - *Moyens et ressources*: données et informations disponibles, équipements utilisés, matière d’œuvre, type de processus, procédés utilisés, relations fonctionnelles, hiérarchiques...
  - *Résultats attendus*: produit ou service à réaliser et conditions de réalisation: critères de quantité, délais, coûts, sécurité, qualité des contacts...
  - *Autonomie et responsabilité*: degré de définition des instructions, champ de responsabilité sur les personnes, les équipements, les produits, conséquences d’erreurs...


**LE RÈGLEMENT D’EXAMEN**

La traduction quasi juridique du référentiel de certification est le règlement d’examen qui précise les modalités de chaque épreuve (écrit, oral, pratique...), leur durée et la pondération des notes obtenues. Cette réglemen-
tation devient de plus en plus complexe car l'Éducation nationale s'efforce de maintenir le niveau des standards de certification tout en les adaptant à la diversification des modes d'accès au diplôme. Traditionnellement décerné à l'issue d'un examen final subi à la fin d'un cursus de formation scolaire ou d'un apprentissage, le diplôme peut aussi se préparer en formation continue ou être obtenu en partie par la validation des acquis professionnels (voir encadré 4). Les modes d'évaluation ont, eux aussi, progressivement changé: apparition du contrôle en cours de formation, évaluation en situation de travail. De ce fait, le règlement d'examen est généralement accompagné d'un texte relativement long qui précise les objectifs de chaque

Encadré 4

La validation des acquis professionnels

La validation des acquis professionnels a été instituée en France par la loi du 20 juillet 1992 qui permet à toute personne ayant exercé une activité professionnelle pendant cinq ans de faire valoir son expérience pour être dispensée d'une partie des épreuves d'un diplôme. Les référentiels des diplômes sont découpés en unités dans ce but. Les dispenses sont accordées aussi bien pour les épreuves générales que pour les épreuves professionnelles mais elles ne peuvent couvrir la totalité du diplôme : une épreuve au moins doit être subie de manière traditionnelle.

Le candidat décrit lui-même dans un dossier les activités professionnelles correspondant au diplôme qu'il souhaite obtenir en ne se limitant pas à une description factuelle. Il est aidé dans la constitution de ce dossier qui est ensuite examiné par un jury comprenant des enseignants et des professionnels. Le jury peut demander à s'entretenir avec le candidat puis il accorde ou non les dispenses demandées.

epreuve, l'objet de l'évaluation et ses différentes modalités de déroulement. Par son caractère concret, la définition des épreuves d'examen peut être considérée comme le mode d'emploi du référentiel de certification. On peut également penser qu'elle est un moyen de limiter les fortes différences dans les taux de réussite aux examens dont nous avons parlé précédemment.

L'articulation des référentiels

L'ensemble du processus de construction des diplômes est conçu comme un enchaînement où les différentes étapes sont articulées entre elles. Les
items du référentiel des activités professionnelles sont développés dans le référentiel de certification qui est lui-même traduit en épreuves d'examen. Cette articulation apparaît assez clairement dans les référentiels du baccalauréat professionnel Secrétariat dont de courts extraits concernant le domaine de la communication sont reproduits dans le Tableau 2: l'activité décrite dans le RAP est traduite en termes de compétences professionnelles puis de connaissances associées dans le référentiel de certification. La construction des programmes de formation ne vient que plus tard, une fois le diplôme construit. Des recommandations destinées aux concepteurs de programmes et aux enseignants peuvent toutefois être faites dès la rédaction du référentiel de certification: illustrer les savoirs dispensés à l'aide d'exemples concrets correspondant à des situations observées en entreprise, établir une liaison avec l'enseignement en économie et gestion, etc.

Le lien entre référentiels n'est pas toujours aussi apparent que dans le cas du bac professionnel Secrétariat que nous avons pris en exemple. C'est pourquoi le guide méthodologique d'élaboration des diplômes demande que les liaisons entre référentiels soient explicitées. Cela donne lieu à des tableaux récapitulant de manière très synthétique les principaux items du référentiel des activités professionnelles et les compétences attendues au moment de l'examen. La compréhension des ces tableaux n'est pas immédiate lorsque l'on n'est pas familier avec la démarche. De plus, certains termes ne sont pas employés dans leur acception commune. Ils font d'ailleurs l'objet d'un lexique qui figurait jusqu'ici dans la plupart des référentiels. Ainsi, "capacité" désigne un ensemble de compétences terminales et joue le rôle d'interface entre les activités et tâches décrites dans le référentiel des activités professionnelles et les compétences du référentiel de certification. La synthèse des capacités et compétences terminales est appelée compétence global.

Tout ceci renvoie à un ingénierie mise au point dans les années quatre-vingts (Ropé et Tanguy, 1994) qui constitue une rationalisation du processus de construction des diplômes mais en complexifie la forme. Certains tableaux d’interface entre les référentiels restent hermétiques à ceux qui ne les ont pas conçus. Globalement, la lecture des référentiels est difficile pour leurs utilisateurs potentiels que sont les enseignants et les candidats
TABLEAU 2. L’ARTICULATION DES RÉFÉRENTIELS
EXTRAIT DU PÔLE “COMMUNICATION” DANS LE BACCALauréAT PROFESSIONNEL SéCretariat

<table>
<thead>
<tr>
<th>RÉFÉRENTIEL DES ACTIVITÉS PROFESSIONNELLES</th>
<th>RÉFÉRENTIEL DE CERTIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>• RELATIONS DIRECTES: ACCUEIL DES PERSONNES ET RECUEIL DES INFORMATIONS UTILES POUR TRAITER LEURS DEMANDES, LES ORIENTER, LES CONSEILLER. (…)</td>
<td></td>
</tr>
<tr>
<td>• RELATIONS DIRECTES ET TÉLÉPHONIQUES: PRÉSENTATION GÉNÉRALE D’UN PRODUIT, DES MISSIONS ET DES SPÉCIALITÉS PROFESSIONNELLES D’UNE ÉQUIPE.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRÉMIÈRE PARTIE: COMPÉTENCES PROFESSIONNELLES</th>
<th>CONDITIONS DE RÉALISATION</th>
<th>CRITÈRES DE PERFORMANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(... ) DANS UNE situation de face à face:</td>
<td>- LE CADRE DES FONCTIONS PRINCIPALES DE L’ENTREPRISE</td>
<td>- QUALITÉ DE L’EXPRESSION, JUSTESSE DU VOCABULAIRE, INTONATION, DéBIT, ARTICULATION</td>
</tr>
<tr>
<td>- SE PRÉSENTER, PRÉSENTER UNE PERSONNE, LE SERVICE, L’ENTREPRISE</td>
<td>- UN CONTEXTE RELATIONNEL ET CULTUREL DONNÉ</td>
<td>- ADÉQUATION DU REGISTRE DU LANGAGE À LA SITUATION</td>
</tr>
<tr>
<td>- ACCUEILLIR UN VISITEUR FRANÇAIS OU ÉTRANGER (…)</td>
<td>- UN CADRE STRATÉGIQUE PROPRE À L’ENTREPRISE</td>
<td>- QUALITÉ DU COMPORTEMENT NON VERBAL</td>
</tr>
<tr>
<td>- RECUEILLIR ET TRANSMETTRE DES INFORMATIONS UTILES POUR TRAITER UNE DEMANDE</td>
<td>- UN ENVIRONNEMENT MATÉRIEL (BUREAUTIQUE, TÉLÉMATIQUE) DONNÉ</td>
<td>- OPPORTUNITÉ DES QUESTIONS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DEUXIÈME PARTIE: CONNAISSANCES ASSOCIÉES</th>
<th>LA COMMUNICATION: PRINCIPES GÉNÉRAUX</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>CONNAISSANCES ASSOCIÉES</th>
<th>LIMITES</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA SITUATION DE COMMUNICATION</td>
<td>ANALYSE DE LA SITUATION DE COMMUNICATION, ORALE OU ÉCRITE</td>
</tr>
<tr>
<td>- NATURE DE L’INFORMATION: ASCENDANTE, DESCENDANTE, HORIZONTALE, FONCTIONNELLE, HIÈRARCHIQUE</td>
<td>- PRISÉ EN COMPTE DE L’ENVIRONNEMENT RELATIONNEL, ORGANISATIONNEL, JURIDIQUE, ÉCONOMIQUE…</td>
</tr>
<tr>
<td>- FORMES DE LA COMMUNICATION: ORALE OU ÉCRITE, INTERNE OU EXTERNE, INTERPERSONNELLE OU DE GROUPE, DIRECTE OU MÉDIATISÉE</td>
<td></td>
</tr>
</tbody>
</table>

Lecture du tableau: les flèches attirent l’attention sur l’articulation entre des items du référentiel des activités professionnelles et du référentiel de certification. Les parties grisées désignent ce qui est traduit dans le référentiel de certification d’abord en termes de compétences professionnelles puis de connaissances associées.
Encadré 5

**D'autres certifications professionnelles que les diplômes...**

Il existe en France des formes de certifications, publiques et privées dont les caractéristiques sont différentes de celles des diplômes. Ce sont les titres homologués et les certificats de qualification professionnelle.

**Les titres homologués:**

La Commission technique d'homologation des titres et des diplômes de l'enseignement technique a pour but de se prononcer sur le niveau des certifications professionnelles qui ne sont pas dispensées dans des établissements placés sous le contrôle de l'Éducation nationale. L'homologation donne, pour trois ans, un label national à des formations dont le champ est généralement plus restreint que celui des diplômes qui, homologués de droit, servent de référence. Les titres homologués les plus importants et les plus stables sont les *certificats de formation professionnelle* de l'Association nationale pour la Formation professionnelle des adultes (AFPA) qui est placée sous la tutelle du Ministère de l'Emploi. La pédagogie et les modes d'évaluation adoptés par l'AFPA sont moins académiques que ceux qui prévalent à l'Éducation nationale, mais la méthodologie d'élaboration des formations en est proche. L'AFPA a formé 161 000 personnes en 1998.

**Les certificats de qualification professionnelle (CQP):**

Ils datent de 1987 et sont mis au point par les branches professionnelles sans concertation avec l'État. Le système est souple et sa validité est limitée à la branche pour laquelle il a été construit mais on assiste actuellement à des demandes d'homologation de CQP. Créés à l'origine sur la base d'une adéquation forte avec des postes d'ouvriers, avec des contenus de formation plus élémentaires que les diplômes, ce type de certification se développe pour les techniciens et les agents de maîtrise. Environ 4000 personnes passent des CQP chaque année.

au diplôme. La difficulté est accrue par la taille des documents (entre 150 et 200 pages pour certains diplômes). Tout cela peut expliquer que les enseignants se réfèrent aux sujets d'examen des années précédentes pour construire leurs cours (Eckert et Veneau, 1999). Si tel est le cas, les recueils de sujets d'examen constituent des instruments de sélection de l'information dans le référentiel de certification et le diplôme devient un élément très structurant de la formation, avec le risque d'appauvrir cette dernière. La complexité des référentiels irait alors à l'encontre des intentions de leurs auteurs qui s'attachent au contraire à donner aux diplômes une base aussi
large et complète que possible, tant en ce qui concerne la formation théorique que la formation professionnelle.

Dans le système français, les disciplines théoriques sont enseignées séparément des disciplines professionnelles. Un mouvement se fait jour actuellement pour inciter à procéder de manière plus itérative et coordonnée mais le cloisonnement reste le cas le plus fréquent, y compris dans les formations alternant des périodes au lycée et en entreprise. Cette séparation est également observée pour l'apprentissage. Le clivage entre théorie et pratique se retrouve dans les diplômes où les connaissances et les savoir-faire sont évalués séparément. Comme dans la formation, des modes d'évaluation combinant théorie et pratique sont conduites mais elles rencontrent la méfiance d'une partie des enseignants et des inspecteurs qui craignent de dévaluer les diplômes.

Le poids accordé à la formation générale dans les diplômes les différencie fortement d'autres certifications françaises comme les certificats de qualification professionnelle et les titres du ministère de l'Emploi qui sont davantage centrés sur la performance professionnelle (voir encadré 5). Ce point constitue également une différence essentielle avec les NVQs britanniques où les standards de qualification distinguent connaissances procédurales et connaissances conceptuelles mais ne les évaluent pas séparément. La différence de statut des connaissances théoriques au moment de l'évaluation structure les stratégies de formation, ce qui n'est pas évalué étant négligé par les étudiants (Canning, 1999). Les responsables du système éducatif français ne veulent manifestement pas prendre ce risque, certains d'entre eux se raidissant parfois sur des positions inverses. Pour toutes ces raisons, et malgré l'introduction de la notion de compétence professionnelle dans les référentiels, le système d'enseignement technique français ne nous semble pas totalement fondé sur la compétence, en tout cas pas au sens où l'est le système britannique. La référence à la compétence professionnelle dans les référentiels de diplômes nous paraît un affichage résultant d'une mise en conformité formelle à de nouvelles directives en matière de politique éducative (Ropé et Tanguy, 1994). Son introduction n'a pas modifié pas fondamentalement la structure de ces référentiels. De plus, répétons le, aucun diplôme n'est construit en référence à un emploi particulier alors que le propre de la compétence professionnelle est bien d'être située dans un contexte.
**L'ÉLABORATION DU COMPROMIS**

Les diplômes français sont le fruit d’un compromis entre des acteurs nombreux, aux intérêts parfois contradictoires. Aux divergences éventuelles entre organismes, peuvent s’ajouter des différences de points de vue au sein de chacune d’elles. Il serait en effet trop rapide de considérer chaque institution représentée en CPC comme un acteur unique. Ceci est particulièrement vrai du ministère de l’Éducation nationale ou des Fédérations d’employeurs.

La mise au point des différents référentiels du diplôme conduit à changer de champ de référence en passant d’un type d’information à l’autre. La difficulté de l’exercice est accrue par le fait que les différentes phases du processus sont prises en charge par des groupes de travail qui réfléchissent en parallèle ou se succèdent mais ne comportent pas exactement les mêmes acteurs. De plus, à chaque stade, un consensus doit s’établir entre les différentes parties prenantes. Le bon déroulement du processus repose sur une bonne coordination entre les deux acteurs qui, à eux deux, sont présents pendant tout le processus de construction des diplômes: le Secrétariat général des CPC et l’Inspection générale (voir tableau 3).

**LES ACTEURS IMPLIQUÉS DANS LA CONSTRUCTION DES DIPLOMES**

**L’ÉTAT**

L’acteur dominant de la construction des diplômes est l’État. L’Éducation nationale, à laquelle nous nous intéressons ici, est loin d’être une entité homogène. C’est au contraire une énorme machine faite de diversité et de contradictions qui la font sans cesse osciller entre soi de l’intérêt général et corporatisme, entre bureaucratie et innovation. Au moment de la construction des diplômes, ces tensions se cristallisent autour des relations entre le Secrétariat général des CPC et l’inspection générale qui sont les deux acteurs présents pendant la plus grande partie du processus (voir Tableau 3).

Jusqu’au début des années quatre-vingts, la maîtrise de la construction des diplômes appartenait de manière incontestée à l’inspection générale,
### Tableau 3
**Acteurs concernés aux différentes étapes de la construction des diplômes**

<table>
<thead>
<tr>
<th>Acteurs</th>
<th>Étapes</th>
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<tr>
<td><strong>Profession</strong></td>
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<td>Employeurs</td>
<td>Secrétariat des CPC</td>
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<tr>
<td>Dossier d'opportunité de création du diplôme</td>
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<tr>
<td>DÉCISION DE MISE EN CHANTIER</td>
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<td>RÉFÉRENTIEL DES ACTIVITÉS PROFESSIONNELLES</td>
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<td>RÉFÉRENTIEL DE CERTIFICATION</td>
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<td>MODALITÉS DE CERTIFICATION</td>
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<td>DÉCISION DE CRÉER LE DIPLOME</td>
<td>✓</td>
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<td>RÉFÉRENTIELS DE FORMATION</td>
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*Lecture du tableau: Le signe ✓ indique une implication systématique dans la construction des diplômes pour l'étape concernée, le signe ± une implication ponctuelle ou occasionnelle.*

le secrétariat général des CPC gérant le déroulement administratif du processus. Avec la définition d'une politique des diplômes, le secrétariat des CPC s'est mis à intervenir sur le fond, tant sur les décisions de création que sur les méthodes d'élaboration (Fourcade et alii, 1992). Les inspecteurs généraux ont diversement apprécié cet empiètement sur leurs prérogatives. Si des collaborations ont fini par s'installer, des conflits larvés subsistent néanmoins, la contestation majeure portant sur la place accordée à la description des activités professionnelles dans le processus de construction des diplômes.

Tous les textes doivent en principe s'enchaîner à partir du référentiel des activités professionnelles. Ce choix méthodologique a été formalisé
par le Secrétariat général des CPC qui a milité très activement pour l'imposer et qui veille aujourd'hui à son respect. Différents éléments rendent cette tâche difficile. D'abord, les activités professionnelles sont des territoires mal connus des autorités éducatives. Ensuite, tout travail de création de diplôme est placé sous la responsabilité d'un chef de projet, inspecteur général le plus souvent. Or, l'inspection générale a d'abord une approche disciplinaire et les approches déductives partant du savoir pour arriver au faire lui sont plus familières que celles, inductives, qui partent du faire pour arriver au savoir. Débuter le travail par l'élaboration du référentiel des activités professionnelles n'est pas toujours accepté par les chefs de projet qui, en cas d'hostilité, peuvent ne s'intéresser qu'au référentiel de certification ou tenir très peu compte des analyses du travail réalisées avant la mise en chantier du diplôme.

En principe, les enseignants et les corps d'inspection ne devraient pas intervenir au stade de la rédaction du référentiel des activités professionnelles mais entrer en scène au moment de l'élaboration du référentiel de certification. C'est loin d'être le cas, la constitution des groupes de travail étant décidée par le chef de projet. Les débats qui en résultent peuvent être assez tendus, la parole des professionnels se heurtant à la manière dont les corps d'inspection se représentent les travail. Pour le Secrétariat général des CPC, l'enjeu du respect de la méthodologie de construction des diplômes est l'affirmation d'une légitimité technique et d'une expertise méthodologique là où l'inspection générale veut le cantonner dans une fonction logistique et administrative. Les remaniements administratifs opérés ces dernières années donnent à penser que les responsables du système éducatif encouragent plutôt les services qui, comme le Secrétariat général des CPC, sont à l'interface entre les mondes de l'éducation et du travail face à une Inspection générale omniprésente et trop centrée sur les savoirs académiques.

**LES EMPLOYEURS**

Les Fédérations d'employeurs ont des caractéristiques aussi diverses que les secteurs d'activités qu'ils représentent. Toutes n'ont pas le même poids face à l'administration, ce qui a des conséquences sur la structure de l'offre de formation. Les branches industrielles les plus puissantes comme la
métallurgie ont, de longue date, tissé des liens avec l'Éducation nationale et ont acquis le savoir-faire administratif nécessaire pour présenter leurs demandes de création de diplômes. Elles obtiennent d'autant plus facilement satisfaction que le Secrétariat des CPC recherche leur collaboration pour impulser des innovations susceptibles d'avoir un rôle d'entraînement pour d'autres secteurs (Bouyx, 1997).

Chaque CPC a sa propre dynamique et, selon les activités, la "domination" est soit industrielle, soit artisanale, ce qui induit des différences dans le degré de spécialisation des diplômes et les voies de formation qui seront ensuite privilégiées. Les secteurs où les petites entreprises et l'artisanat dominent réclament généralement des diplômes plus spécialisés afin de réduire le temps d'adaptation au travail après l'embauche. Ces entreprises n'ont pas toujours suffisamment de personnel qualifié pour dispenser aux jeunes embauchés le complément de formation qui leur est nécessaire. Elles préfèrent donc reporter sur l'État la charge technique et financière de la formation.

On s'interroge parfois sur la représentativité réelle des représentants des employeurs siégeant en CPC. Leur légitimité conditionne à la fois la pertinence et la valeur du titre. Aux yeux de l'Éducation nationale, elle en conditionnerait également en partie l'acceptation par les entreprises. Or, il arrive que les branches professionnelles soient représentées par des personnes qui ont quitté des positions opérationnelles depuis un certain temps et qui, de ce fait, ne sont plus très proches de la réalité du travail. On constate le même phénomène pour les représentants des salariés. Une des raisons majeures de cette situation est que l'implication dans le processus de construction d'un diplôme demande du temps et de l'argent. Les entreprises ne souhaitent pas prélever ce temps sur la production en sollicitant systématiquement des cadres opérationnels. Ceux-ci sont donc consultés ponctuellement, dans le cadre de groupes de travail consacrés à des points particuliers des référentiels.

La question du niveau d'implication des professionnels dans la construction des diplôme est importante car l'Éducation nationale s'appuie sur eux pour en définir le contenu et la cible. Au moment de la rédaction du référentiel des activités professionnelles, ils sont en principe les acteurs les plus importants. Tirer toutes les conséquences de cette situation conduit à penser que les employeurs ne s'impliquant pas dans les CPC sont responsables des faiblesses qu'ils reprochent aux diplômes.
Les représentants des salariés

Les organisations syndicales de salariés représentatives de la branche sont consultées au moment de la création et de l'actualisation des diplômes. Elles ne constituent pas une force de proposition identique à celle que représentent les syndicats allemands qui sont à même de demander la création de diplômes. Les salariés français sont peu familiers des règles du jeu qui prévalent dans ces instances pour des raisons qui sont en partie historiques. Lorsque les CPC ont commencé à fonctionner, les syndicats de salariés se sont fait représenter par leurs membres enseignants (Brucy, 1998). Ils ont ensuite pris conscience que ces derniers connaissaient mal la réalité de l'entreprise et réagissaient parfois de manière assez corporatiste (Fourcade et al., 1992). Les confédérations d'ouvriers, d'employés et de cadres participent maintenant aux CPC mais semblent très gênées par la dissociation entre la construction des diplômes et leur reconnaissance conventionnelle et salariale. Le ralentissement de la négociation collective nationale en France sur les salaires amène parfois les représentants des salariés à utiliser la parole qui leur est donnée pour rappeler leurs exigences ou les dispositions conventionnelles en matière de correspondance entre le diplôme, la place dans l'organisation du travail et la rémunération. L'évolution récente du débat social sur la certification et la validation des compétences pourrait justifier leurs inquiétudes car les critiques adressées aux diplômes par une partie des employeurs sont en grande partie soutenues par le souhait de mettre en cause les liens conventionnels entre certification et salaire.

La description du travail et le référentiel des activités professionnelles

Tout diplôme professionnel suppose une référence au travail. Qu'il s'agisse de métiers, de professions apparemment bien identifiés ou d'emplois aux contours plus variables, la création d'un diplôme peut être l'occasion de faire le point sur l'évolution des activités concernées. La présence des professionnels en CPC ou le recours à l'expertise répondent à cette nécessité. Se pose ensuite la question du choix et du traitement de l'information disponible.
LE RAP: UNE MISE EN FORME DE L’INFORMATION SUR LE TRAVAIL

C’est dans le référentiel des activités professionnelles que la référence aux situations de travail est la plus évidente. Or la rédaction de ce référentiel n’est pas toujours précédée d’analyses du travail systématiques et les informations dont dispose la CPC sont souvent hétérogènes: descriptions d’emplois faites par les entreprises, études préalables à la mise en chantier du diplôme ou, le plus souvent, témoignages des professionnels participant aux groupes de travail.

La nature consultative du processus de création des diplômes fait que, même lorsque des analyses systématiques ont été faites, les conclusions des experts ne dispensent pas d’une discussion entre partenaires. Il faut ensuite organiser l’information disponible selon une grille unique, en trouver les points communs, obtenir un consensus. Le guide méthodologique de rédaction du référentiel des activités professionnelles a été créé dans ce but. Il vise également à éviter les descriptions trop brèves, les formulations trop générales et à réduire la grande hétérogénéité des référentiels, chaque CPC ayant des méthodes spécifiques. Les variations observées dans les formes que prend ce référentiel et dans le détail des descriptions montrent que la description produite est une construction qui reflète tout autant le consensus entre les différents acteurs impliqués que le travail réel. La décision de créer un diplôme renvoie d’abord au marché du travail, parfois à la nécessité de gérer des flux scolaires et ce n’est qu’au moment de la définition des référentiels que l’on s’intéresse à la nature des activités professionnelles.

UNE CONSTRUCTION THÉORIQUE: LES DIPLOMÉS TRANSVERSAUX

Les CPC s’efforcent de donner aux diplômes des cibles professionnelles indépendantes de telle ou telle forme d’organisation du travail afin d’élargir les possibilités d’insertion et de mobilité ultérieure de leurs titulaires. De ce fait, construire un référentiel des activités professionnelles conduit à rechercher les dénominateurs communs entre des situations professionnelles diverses. Il est nécessaire de franchir un pas de plus dans l’abstraction lorsque l’on crée des diplômes dont la cible professionnelle correspond à plusieurs branches. La recherche de dénominateurs communs est alors
plus complexe que lorsqu’il s’agit de rendre compte de la diversité des situations d’emploi dans un domaine présentant une unité technologique.

Les diplômes communs à plusieurs branches sont apparus en France au milieu des années quatre-vingts. Nous ne parlons pas ici de spécialités qui trouvent leurs applications dans des secteurs très divers comme l’électricité, l’électronique, la mécanique, la comptabilité ou le secrétariat mais de diplômes dont la transversalité est fondée sur l’identification d’éléments techniques communs à différentes activités. Certains de ces diplômes ont été fondés sur l’hypothèse que l’outil et les méthodes imposées par l’automatisation structurent davantage le travail que les matières ouvées elles-mêmes. Il en est résulté des diplômes centrés sur la conduite ou le pilotage de machines ou d’installations automatisées. Une autre approche se fonde sur des parentés dans les modes de transformation des produits fabriqués ou sur des similitudes entre ces produits eux-mêmes. Il existe des diplômes regroupant l’habillement et le cuir autour du concept de "Matériaux souples" tandis que la fonderie, la céramique et l’industrie textile sont fédérées dans la "Mise en œuvre des matériaux". Cette forme de transversalité est mal acceptée des branches qui font du diplôme un élément de leur identité professionnelle. Exclus dans l’artisanat, les diplômes transversaux peuvent également rencontrer l’hostilité des petites entreprises qui craignent de voir augmenter le temps qu’elles devront consacrer à l’adaptation des jeunes diplômés.

**LE DIPLOME, LA FORMATION ET L’ÉVALUATION**

Une fois le diplôme créé, comment est-il utilisé ? Nous avons déjà évoqué l’arsenal administratif qui réglemente les examens. Nous allons ici nous intéresser à la manière dont sont utilisés, en situation, les référentiels.

Nous avons vu qu’au moment de l’élaboration de ces référentiels, un consensus doit se faire sur la description des activités qui constituera la cible professionnelle du diplôme. Nous considérons cette description, la définition des critères de certification, puis leur mise en œuvre au moment de la formation et de l’évaluation comme une série de traductions. Plus la cible professionnelle d’un diplôme est large, plus la formulation du référentiel est abstraite et plus le travail de traduction à effectuer en aval est important. Nous allons illustrer les problèmes posés par la construc-
tion puis l’usage des référentiels communs à plusieurs activités à l’aide d’un exemple, celui du CAP d’Exploitation d’installations industrielles.

Le projet initial visait à outiller la mise en place d’une formation conduisant à un CAP pour des ouvriers de production dans l’industrie automobile. Ainsi formulée, la demande de création de diplôme n’était pas recevable car jugée trop spécifique. L’entreprise a accepté de s’impliquer dans la construction d’un CAP transversal pour obtenir satisfaction. Le Tableau 4 compare un extrait de la description des activités fournie par l’entreprise lorsqu’elle a demandé la création du CAP d’Exploitation des installations industrielles à la traduction qui en a été faite dans le référentiel des activités professionnelles et à l’item correspondant du référentiel de certification. La cible professionnelle proposée par l’entreprise était déjà large puisque les titulaires du diplôme devaient être à même d’intervenir à des différents stades du cycle de fabrication ( tôlerie, peinture, fonderie, usinage, etc.). Le CAP créé va plus loin : les référentiels ne désignent aucun procédé particulier et en restent à un type d’activité qui peut être exercé dans n’importe quelle entreprise industrielle. Et, de fait, ce CAP est préparé dans des secteurs d’activité aussi différents que la construction automobile et certains cycles de fabrication de l’industrie textile. Mais, pour pouvoir être utilisé, il est nécessaire de l’adapter aux situations.

Dans l’exemple que nous venons de donner, l’entreprise de construction automobile avait décrit ce qu’elle attendait du titulaire du diplôme en spécifiant le contexte des interventions. Cette précision, qui disparaît du référentiel du CAP, devra nécessairement réapparaître au moment de la formation et de l’évaluation. Lorsque le formateur décide de la manière dont il va transmettre les connaissances et savoir-faire requis par le diplôme, il est amené à les replacer dans un contexte pour leur donner une consistance ou faciliter leur acquisition. Dans le cas de l’apprentissage et de la formation des adultes, il faut s’assurer que les situations de travail sont réellement formatives. Lorsque l’on adapte la partie professionnelle du référentiel de certification à une situation particulière, on veille à respecter les exigences définies au niveau national. Ce travail est très exigeant pour les formateurs. En formation continue, il est indispensable que l’entreprise dispose des compétences nécessaires et d’une bonne logistique, ce qui explique que les petites unités préfèrent des diplômes assez spécialisés (Kirsch, 1997b).
Le même processus d'adaptation locale du référentiel de certification doit intervenir au moment de l'évaluation. Pour les épreuves pratiques, l'examen se déroule toujours dans un contexte spécifique qui doit être représentatif des compétences affichées par le diplôme. Si l'on reprend l'exemple du CAP d'Exploitation d'installations industrielles, dans l'industrie automobile on s'assurera que les réglages des trajectoires des robots en tôlerie ou en peinture sont corrects tandis que dans le textile les réglages concerneront des machines de tissage ou de tricotage.

La prise en compte des situations particulières doit être encore plus forte lorsqu'il s'agit de valider des acquis professionnels. La description du travail rédigée par les candidats aux diplômes par la validation d'acquis de l'expérience sont forcément spécifiques (voir supra: encadré 4). Si, au moment de l'évaluation, on se contentait de juxtaposer le standard de certification et la description que le candidat fait de son travail, on comparerait deux traductions dont les points communs pourraient être difficiles à identifier. L'aide apportée aux candidats dans la description de leurs activités

<table>
<thead>
<tr>
<th>DESCRIPTION DONNÉE PAR L'ENTREPRISE</th>
<th>RÉFÉRENTIEL DES ACTIVITÉS PROFESSIONNELLES</th>
<th>RÉFÉRENTIEL DE CERTIFICATION DU CAP</th>
</tr>
</thead>
</table>
| PROCÉDÉ AUX RÉGLAGES ET CORRECTIONS DE RÉGLAGES NÉCESSAIRES:  
• PARAMÈTRES DE SOUDURE ET CORRECTION DES TRAJECTOIRES ROBOTS EN TÔLERIE;  
• DéBIT ET TEMPS DE PASSAGE ET CORRECTION DES TRAJECTOIRES ROBOTS EN PEINTURE;  
• ÉCHANGE PLAQUES-MODELES ET RÉGLAGE MACHINES À MOULER ET ORGANES CONNECTÉS EN FONDRÉE;  
• ÉCHANGE, RÉGLAGE ET CORRECTION DE RÉGLAGE DES OUTILS, SUR LES MACHINES OU EN PRÉPARATION (SUR BANCS) EN USINAGE, ETC. | SURVEILLER, DÉTECTER, ALERTER ET/OU AJUSTER LE PROCÉDÉ DANS LE CADRE DES PRESCRIPTIONS  
ASSURER LES CHANGEMENTS DE FABRICATION. | EFFECTUER LES RÉGLAGES:  
— AFFICHER LES PARAMÈTRES DE RÉGLAGES,  
— FAIRE UN ESSAI,  
— COMPENSER SI NÉCESSAIRE.  
NB.  
Ces indications générales sont complétées par des indications sur les conditions de réalisation de l'activité (celles dont le candidat doit disposer pour réaliser la performance demandée) et les critères en fonction desquels sera il sera évalué (dans le cas présent: qualité du produit, respect des règles de sécurité et de l'outil). |
est nécessaire pour limiter ce risque et préparer le travail des jurys qui dispensent des épreuves d'examen.

Tous les diplômes français n'ont pas une cible professionnelle très large, certains d'entre eux peuvent même être très spécialisés, notamment dans l'artisanat. Tous ne demandent donc pas un très gros effort d'adaptation au contexte local. En prenant l'exemple d'un CAP commun à plusieurs industries, nous avons souhaité montrer qu'un référentiel de certification peut être à la fois une norme et une structure suffisamment souple pour être adaptée à des contextes très divers. Il faut ajouter que le contrôle des traductions que subit le référentiel est assuré par les corps d'inspection qui sont les garants de la qualité de la formation et de la fiabilité des évaluations. Enfin, c'est sans doute lorsqu'il est adapté à des situations spécifiques que le diplôme français se rapproche le plus des systèmes basés sur la compétence.

**DES POINTS EN DÉBAT ET EN ÉVOLUTION**

La complexité du processus de construction des diplômes est souvent critiquée et mal comprise. Elle est pourtant inhérente à ce qui fait leur valeur : validité nationale, règles qui leur confèrent un statut de norme, distance vis-à-vis de situations spécifiques, consensus - au moins apparent - entre partenaires sociaux et instances éducatives. Les délais de fabrication des diplômes sont de plus en plus mal acceptés alors qu'ils sont plus courts que ceux des diplômes allemands et identiques à ceux que demande la mise au point d'une NVQ au Royaume-Uni. Force est de constater que le ministère de l'Éducation nationale fait peu d'efforts pour informer sur ses méthodes et ses produits. Il est donc la cible d'attaques venant des employeurs, notamment ceux qui développent des certifications de branche. Il est également en rivalité, sur le terrain de la certification, avec le ministère de l'Emploi. Ce dernier demande d'ailleurs la création d'une instance d'information et de coordination nationale concernant l'ensemble des certifications professionnelles : cela représenterait un progrès, à condition que toutes les parties prenantes jouent le jeu... y compris le ministère de l'Emploi.

Les critiques des employeurs posent différents problèmes. Le premier est l'absence éventuelle de relais, auprès de leurs mandants, de ceux qui participent à l'élaboration des diplômes. Le second est celui la
représentativité des personnes qui siègent dans les CPC. Le troisième est plus fondamental car il oppose les gestionnaires du système éducatif, qui s'efforcent de diminuer le nombre de diplômes en élargissant leur cible professionnelle, à des employeurs qui demandent des diplômes toujours plus spécialisés. Cette tension récurrente a probablement joué d'une part dans la création de certifications alternatives, notamment les Certificats de qualification professionnelle, d'autre part dans l'intérêt porté au système des NVQs britanniques. Enfin la critique la plus radicale adressée à l'école par une partie des employeurs est qu'elle ne donne pas de compétences professionnelles, celles-ci ne pouvant se former qu'en entreprise. Le débat est éminemment politique et ne porte jamais sur la nature des compétences en question et leur transférabilité.

Ce climat alimente la méfiance, voire le rejet des instances éducatives françaises à l'égard des NVQs et des positions de la Commission européenne en faveur de l'accréditation des compétences individuelles par progiciels. Dans les deux cas, les responsables du système éducatif et les enseignants perçoivent une mise en cause de leur conception de la formation et de l'évaluation qui reste encore très fondée sur les savoirs disciplinaires et la rédaction sur papier. Cependant, des expériences d'évaluation par progiciel sont conduites dans les universités et même dans l'enseignement du second degré. Il paraît difficilement concevable de ne pas s'y intéresser pour de multiples raisons. L'une d'elles est que leur mise au point oblige à ouvrir cette boîte noire que reste l'évaluation car ces méthodes exigent une stricte formalisation des critères utilisés. De plus, certains progiciels gardent en mémoire les démarches intellectuelles des candidats. Enfin, la vérification des connaissances est beaucoup plus exhaustive que dans un examen classique ce qui conduit à s'interroger sur l'objectif de l'évaluation et sur sa fonction. Toutefois, la prudence affichée en France vis-à-vis des progiciels d'accréditation ne repose pas uniquement sur un conservatisme étroit. Comme toute certification, elles peuvent structurer les modes d'apprentissage. Si trop d'évaluations à caractère fragmentaire se développent, que pourra-t-on dire de la compétence globale des détenteurs de certificats multiples répertoriant des savoir-faire hétérogènes?

Le ministère de l'Éducation nationale, qui forme la quasi totalité des jeunes, mais aussi de nombreux adultes, se trouve en position de forteresse qui résiste avec plus ou moins de facilité et d'efficacité à des partenaires
qu'elle considère, à tort ou à raison, comme des assiégeants. La discussion prochaine au parlement d'un projet de loi sur la validation des acquis de l'expérience et la certification professionnelle devrait l'obliger à s'ouvrir au débat, que la loi soit votée ou non. Ce projet prévoit que les certifications à finalité professionnelle et en premier lieu les diplômes, pourront être obtenues en totalité par la validation des acquis de l'expérience. Jusqu'ici une partie du diplôme devait obligatoirement faire l'objet d'un examen professionnel. Le corps enseignant devra donc nécessairement s'intéresser aux activités de travail et approfondir la difficile question de l'identification des connaissances théoriques dans la pratique. Cela sera difficile compte tenu du primat des savoirs académiques dans le système éducatif français.

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Making the difference: Competency based education and training in Australian manufacturing industry

JEREMY GILLING AND DAVID GRAHAM

A REFORMED NATIONAL TRAINING SYSTEM

Australia has over the past decade gone further than most other industrialised countries in reforming our national vocational education and training (VET) system. We have become the subject of quite intense interest in many parts of the world, particularly those countries that share many of the problems and challenges we face in the highly competitive global market.

Some of the drivers of the Australian reform process have been internal to the system. Australia has a federal system of government and public administration, with a national government responsible for defence, foreign policy, broad economic management (including most taxes) and policymaking in areas of agreed national interest. The six State and two Territory governments administer the major community services in their jurisdiction (health, education, transport, police and utilities), for which they receive substantial funding from the national government according to an annually negotiated, and usually hotly disputed, formula. A third tier, local government, delivers municipal services.

Historically, the States and Territories have jealously guarded their right to determine policy in their areas of responsibility. They have bitterly resented efforts by the federal government to impose national policy and strategic directions in their jurisdiction. However, a landmark agreement was reached in 1996 (and reinforced in subsequent years) between the several ministers with responsibility for VET on the need for, and the broad outline of, a national framework for training, built on a shared recognition of the waste, duplication and inefficiencies inherent in funding, administering and regulating eight separate and substantially uncoordinated VET systems.
But the major impetus for reform has come from external factors. Globalisation and the winding back of tariffs and other forms of industry protection have exposed our industries to intense competition, particularly from low cost, high volume producers in Asia. We have recognised since the mid-1980s that we can only compete effectively on the basis of quality, customer responsiveness, and niche production and marketing - not on cost or volume.

At the same time, industry skill requirements are much enhanced as a result of workplace and technological change (discussed in the case study below). Further to this point, the emerging evidence is that, among the developed countries at least, there is a quite strong relationship between a country's productivity and its "qualifications profile" (the proportion of its working age population with post-school qualifications). This relationship, which is especially marked for the non-university post-school qualifications profile, is increasingly accepted among expert commentators as being causal. And Australia's qualifications profile - especially our non-university qualifications profile - is poor, and appears to be slipping further, relative to other industrialised countries. It is a particularly worrying trend that demands a major national effort to reverse.

An additional factor has been the recognition, flowing from recent legal decisions (notably the 1999 Royal Commission into a fatal gas plant explosion in Longford, Victoria, that crippled Victorian industry for weeks), of operator and corporate "duty of care" in relation to workplace safety and the environment. Companies now have an explicit obligation to provide workers (especially those in hazardous areas) with training in and understanding of the process, not just of operational procedures.

1 Indications are that we have achieved significant success in this strategy. A 1994 study noted that our ratio of exports of elaborately transformed manufactures (ETMs) to imports of ETMs had doubled from 15 per cent in 1985 to 30 per cent in 1993 – a trend that if sustained would by 2001 allow our economy to grow within the constraints of our balance of payments by perhaps 2 percentage points a year more than otherwise (P.J. Sheehan, Nick Pappas and Enjiang Cheng, The Rebirth of Australian Industry, Centre for Strategic Economic Studies, Victoria University, Melbourne, 1994, pp viii to x).


Individuals, too, are demanding—in an increasingly uncertain and competitive labour market—that their skills be formally recognised through national portable qualifications. At the same time, the career expectations of young people and their parents have changed dramatically in recent years. Manufacturing industries must offer all entrants fulfilling and achievable career paths if they are to attract more ambitious and academically gifted young people.

And finally, there is the matter of social justice. Under the VET system that prevailed until at least the late 1980s, most non-trades production workers were effectively denied skills recognition and access to publicly funded VET resources that were to all intents and purposes earmarked for the traditional trades and higher-level technical studies.

**The National Training Framework—responding to the challenges of a new era**

This then is the economic and historical context within which the National Training Framework has been developed and implemented within Australia. This fundamental and pathbreaking reform has been built on a fortuitous but strong and apparently enduring “coalescence of government, union and employer resolve”—a resolve that, to the surprise of some,

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4 "[T]he operative was excluded from credentialed learning after the formal training market was captured by craft unions and professional associations in the early twentieth century, a position reinforced by post-WWII microeconomic reform and the introduction to the workplace of principles of scientific management" (Michael Brown and Peter Rushbrook, "Bringing in the Operative: Case Studies in Work-Based Training and Micro-Economic Reform" in Fran Ferrier and C. Selby-Smith (eds.), *The Economics of Education and Training 1995*, AGPS, Canberra, 1995, p 16).

Australia’s VET system has been defined around the traditional male-dominated apprenticeships. Around these, craft unions built militant labour organisation. Reform of this trade system proceeded, not only in the interests of equity, but because the Australian business community considered the craft identity generated by the apprenticeship and fostered by craft unions was a threat to the new workplace culture of a globalising economy" (Peter Ewer, *Picking up the Pieces: Trade Union Strategies for Vocational Education and Training*, Monograph, URCOT Research Centre, Royal Melbourne Institute of Technology, May 1999, p ii).

5 Brown and Rushbrook, *op. cit.*, p 20
survived intact through the changeover in 1996 from a social-democratic to a conservative national government. The stakeholders' shared commitment to the national system, and to the broad structure of that system, is built on a common understanding (despite their divergent agendas) of the scale and nature of the challenges facing Australia in the global economy. It is a commitment that also spans party politics (despite some recent hiccups) and different levels of government.

The first efforts to institute a national VET system linked training and training reform closely to the industrial sphere. A historic "Accord" between the union movement and the new Hawke Labor Government in 1983, under which wage demands were tempered in return for regular, assured cost of living adjustments and improvements in the social wage, led in 1988 to the parties' agreement to the so-called Structural Efficiency Principle. The SEP provided for the restructuring of workplace practices and greater industrial democracy, the dismantling of productivity-sapping demarcations (as well as a substantial reduction, through often acrimonious amalgamations, in the number of separate unions), and skills development through structured training arrangements. In order to deliver on this last component, the entire VET system was subjected to a major and dramatic overhaul.

The key reforms were

- the introduction of competency based vocational training (adapted mainly from Britain), designed to supplant training through classroom based learning outcomes
- the promotion of flexible training delivery options, including workplace and distance learning, and
- the recognition of competencies acquired on the job (usually) without recourse to formal classroom learning (so-called recognition of prior learning, or RPL).

From the start, this new system was viewed by participants—not just industry and individual learners, but to a large extent those who were charged with implementing and delivering to the system—as being overly bureaucratic and cumbersome. But its major shortcoming, at least in the view of much of industry, was that it tied skills development and recognition outcomes too closely to the industrial relations domain.
The clearest manifestation of this problem was found in the new eight-level Australian Standards Framework (ASF), which in essence sought to "fit" every job to a level according to the skills, responsibilities and degree of workplace autonomy it embodied. National competency standards (collections of competency "units", each a description of a discrete workplace outcome and its associated performance standards) were developed to describe job roles, and the units were then "packaged" into the separate ASF levels. Companies feared (with some justification) that by signing on to the national training agenda, they could be presented with an industrial *fait accompli* regarding job classifications and conditions of employment.

In the months leading up to the change of government in 1996, the key players came to recognise that for the new system to be sustained, firstly it had to be simplified, and secondly the link between the industrial and the training domains had to be diminished. The modified and somewhat simplified system is now known as the National Training Framework.

There are three main components to the NTF:

- national Training Packages, which will in time cover all major industry and/or occupational groups across the entire Australian workforce;\(^6\)
- the Australian Qualifications Framework (replacing the ill-fated Australian Standards Framework); and
- the Australian Recognition Framework, under which recognition of competencies and qualifications is accepted across all States and Territories, and quality of outcomes is assured at several key stages.

**Training Packages**

Training Packages are the cornerstone of competency-based training in Australia. Each package —there are now around 60 in all— is an integrated delivery and assessment resource comprising:

\(^6\) At time of writing they cover around 60 per cent of workers, mainly the non-professional occupations.
• competency standards: individual outcome statements ("units of competency"), developed in close consultation with industry, specifying workplace performance requirements and the criteria by which competency is evaluated
• the rules governing the packaging of competency units into national qualifications (see below) — typically, these rules specify the "core" (compulsory) units, a bank of "stream" units and a broad menu of elective units
• guidelines for assessing workplace competency under the particular package.

Packages also include a wide range of supporting materials to assist in workplace implementation.

There are three critical differences between competency based training under Training Packages and the conventional classroom focused, learning outcome based, training of past decades:

• under Training Packages, the learner receives a national qualification if and only if that person is assessed as competent in the units of competency that are prescribed for that qualification under the package — the learning pathways open to individual learners are limited only by resources and imagination
• except in the rare instances where legislative provisions apply (such as in the operation of certain vehicles or plant and equipment, or where professional registration is a prerequisite for practising a vocation), there is no judgement about where, when or how the learner acquired the skills and knowledge that competency entails
• accordingly, there is no judgement about how much (or indeed how little) time a person takes to acquire competency — a radical departure from, for example, the traditional craft based apprenticeships.

THE AUSTRALIAN QUALIFICATIONS FRAMEWORK

On the face of it, the AQF looks very much like the old Australian Standards Framework that it replaces. There are the same eight levels, and the
level descriptors don’t look much different between the old and the new. What is different is that the AQF does not aspire to differentiate jobs, but simply qualifications. Certificates I to IV (AQF 1 to 4) take the learner from essentially entry-level training to high level technical skills; the diploma and advanced diploma (AQF 5 and 6) are shared qualifications between the vocational and the higher education (university) sectors; with bachelor and higher degrees aligned to AQF 7 and 8.

As noted above, the criterion for awarding a qualification under a Training Package is no more nor less than that the person has been assessed as possessing the competencies that define that particular qualification—no matter how, when or where those competencies were acquired.

Significantly, too, the national training system now places itself at arm’s length to the industrial relations system. If an enterprise or an industry chooses to embody the achievement of particular qualifications into its workplace classification structure or industrial award, that is a matter for the negotiating parties. The system obviously views this path as desirable, in that it encourages workers to develop their skills through structured learning, but makes no effort to mandate such an approach.

**Quality Assurance**

It was recognised very early on that this quite radical system would stand or fall on our success in building quality assurance into the process. Confidence in the system’s products—qualified learners, whose workplace capabilities are nationally certified—depends crucially on the perceived rigour of the learning and particularly the assessment process.

There are two key quality assurance points under the new national system. The first is the stipulation that only a qualified workplace assessor—an assessor who has him/herself been assessed as holding the competencies of assessing competence—can undertake or oversee competency assessment.
The second relates to the requirements for becoming a Registered Training Organisation. Only an RTO can issue a national qualification\(^7\). The scope of registration of an RTO prescribes the Training Packages and qualifications it is registered to deliver, and the industry and occupational areas it is registered to service. The currency of its registration is contingent on a cycle of review and compliance audits to determine the quality and consistency of its operations, its products and its services\(^8\).

**Room for Improvement**

The authors are firm supporters of the new national system as a necessary and overdue reform to revitalise vocational education and training in this country, to sustain our industries' global competitiveness, and to extend access to structured learning to hundreds of thousands of workers whom the system had previously bypassed.

This not to say that Australia's new VET system is the last word in efficiency, relevance and responsiveness. There have been significant teething problems – inevitable, we would argue, with such a radical and far-reaching reform. There are groups in the community – particular those who have accessed VET for purposes of personal rather than vocational advancement – whose needs have undoubtedly slipped in priority. There are demands and stresses on VET teachers, who are being asked to move well beyond the comfort zones they have built up over several decades of traditional training delivery. There are undoubtedly some rorts and abuses – though far fewer, we believe, than the critics of the new system allege.

There are also things that we didn’t get right the first time around, and others that could have been done differently if we had our time over again.

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\(^7\) This is not to say that only RTOs can deliver training or assess competence – on the contrary, the model actively promotes and encourages training delivery partnerships between RTOs and enterprises (who may indeed be RTOs in their own right), or between registered and non-registered providers (such as high schools).

\(^8\) RTOs that achieve "quality endorsement" are allowed to manage, and extend, their own scope of registration.
There remains a lively debate in VET circles in Australia as to whether, in moving from a content focus to an industry focus, we have allowed the “national currency” (units of competency) to become too task and outcome based, to the diminution of theory and underpinning knowledge. In NSW (the largest State), the Government has retained traditional curriculum as an interface between competency outcomes and theory. And Training Package developers are now charged with paying greater attention to underpinning knowledge in either the competency standards themselves or by reference in the supporting materials.

The second false step, as noted above, goes back to the first attempt, in the early 1990s, to package units of competency. The mistake then was to try to package and align the units not into formal qualifications, but to skill levels and thus job roles. This, as we now recognise, quite unnecessarily raised industrial relations tensions (particularly on the employer side) and expectations (on the union/employee side), and retarded industry acceptance of the new system. Both sides now acknowledge that competencies are tools for learning and skills development, not bargaining chips.

We also agree with some of the recent comments of one of the architects of the NTF—the former General Manager of the Australian National Training Authority and now Deputy Director-General of the Queensland Department of Education, Training and Industrial Relations, Peter Noonan— to the effect that “the change management process had not been well handled”\(^9\). There was undoubtedly too much attention to the “front-end” structural reforms at the expense of “back-end” courting and professional development of those most immediately affected: traditional classroom teachers in vocational colleges. They should also have been much more closely involved in the design and development of the Training Packages that they primarily are asked to deliver.

The message—that the NTF, far from being the end of their world, offers them new vistas and continued relevancy in a rapidly changing world—was sadly neglected in the early “crash through or crash” days. It is an oversight that those who may emulate Australia’s experiment would do well to learn from.

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Finally, we took a while to take to heart the message from industry and the wider community that the system had to be as simple, stable, transparent and non-bureaucratic as possible. There was too much fiddling with the system in the early days, with far too many acronyms, too many multi-layered “frameworks”, and too many regulatory and administrative bodies involved in the process. Australia has to cope at the best of times with three layers of government, with far from mutually agreed demarcations of responsibility. It is hardly surprising that industry’s initial response to an over elaborate VET structure superimposed on our cumbersome federal system of government was lukewarm at best.

**THE NEW NATIONAL SYSTEM IN ACTION—A CASE STUDY IN SUCCESSFUL IMPLEMENTATION**

We have long argued that training reform and workplace reform should go hand in glove. Training to achieve narrow, low level technical skills—the how, but not the why— is one thing. But if the goal is to build a skilled, committed, adaptive and responsive workforce, then the workplace culture and organisational structure must support and reflect this objective. The example of Huntsman Chemicals is a classic illustration of this imperative.

**Huntsman Chemical Company Australia—A Company in Crisis**

The Australian arm of Huntsman Chemical Company (HCCA) began as the Southern Cross Chemical Company in 1928 in the form of a joint venture between Monsanto Limited and the Nicholas Company. They moved to the 100-acre site in West Footscray, Melbourne, in 1946 and traded as Monsanto Australia Limited. Expansion has occurred over the years through the introduction of new product lines, and HCCA, which houses nine separate production facilities employing 450 people, is now one of the largest local producers of many plastic and resin intermediate products.

In the late 1980s, the company was purchased by Kerry Packer’s Consolidated Press Holdings (CPH) and changed its name to Chemplex. After a period of rationalisation, the US corporate fixer Al Dunlap was hired
to reorganise the company. In order to reduce costs, he instituted a 15 per cent staff reduction and a new reporting structure, and moved the head office from the city to the manufacturing plant at West Footscray.

The site was still troubled by bad industrial relations, low productivity and the threat of foreshadowed tariff reductions, all of them problems endemic to the Australian petrochemical industry at that time. This, combined with a downturn in the cyclical styrene market, induced CPH to look at divesting the company. At about that time the chairman and CEO of the US based Huntsman Corporation, Jon Huntsman, was looking to acquire a business in Australia, and the result was the HCCA joint venture between Jon Huntsman and Kerry Packer, with the Huntsman Corporation having management responsibility. The transition team from Huntsman USA and local management knew that radical changes in the way we operated, including our skills base and IR strategy, were critical if we were to save the business.

**THE CHALLENGE FACING AUSTRALIAN INDUSTRY**

Huntsman was certainly not alone in confronting this challenging industrial climate. The two major environmental changes that have impacted on Australian industry since the mid-1980s—the gradual removal of tariff protection, and growing regional industrialisation—equally affected Huntsman’s local colleagues and competitors.

As Australian industry grew from the 1950s through the 1970s, tariffs and other forms of protection insulated industry to a large extent from overseas competition. Under this protective umbrella, unwise and wasteful use of both labour and material resources occurred. Our Australasian neighbours were rapidly industrialising. They were building new plants and fitting the latest technology. Not only did that add new competitors to the marketplace; these new, highly automated plants required lower manning levels than comparable volume plants in Australia, which meant lower labour conversion costs and thus lower prices.

Australian industry, instead of looking at new technology or innovative work patterns, added the extra cost of production to our tariff protected products. Many enterprises, large and small, could not or would
not address this issue any other way. Many did not have the capability or processes available to upskill their workforce, as there were no nationally accredited courses outside of the traditional trades areas to address the needs of many manufacturing workers.

At the same time, Australian industry's competitive advantage—lower prices through tariff protection—was being reduced. In the words of noted commentator and former CEO of General Electric, Jack Welch, if you don't have a competitive advantage, don't compete.

Many Australian manufacturing enterprises have over recent years failed to rise to this challenge and have now either closed down, amalgamated with others to gain economies of scale, been taken over or gone offshore.

This is not an attack on the decision (supported and implemented in government by both sides of politics) to reduce tariffs. Rather it is the story of how one company, Huntsman Chemical Company Australia, restructured their business and as a part of that restructuring process reorganised and trained their workforce in a new, more skilled way of working.

**How Huntsman Responded**

Huntsman restructured and reduced their workforce, as did many others, in an attempt to remain competitive. This workforce reduction, although it had the necessary effect of cutting costs, was at best a short-term solution, and in itself created other problems. The traditional middle management roles, which were the first to be made redundant, had to be taken up by the remaining workforce. The workers needed to be skilled quickly to take on and share these roles.

Also, as we modernised our plants to compete in this market environment, we had to train our workforce to effectively utilise the new technology now available. Both the new technological or "hard" skills and the "soft" skills and capabilities required to work as teams were critical to our success.

**New Work Structures**

We recognised that the greater the degree of involvement and participation at all levels, the greater were our chances of success. We decided to
structure the workforce in teams, and at the same time cut the number of reporting levels from, in some cases, seven down to four. The figure below shows how this was achieved in the maintenance and the operations areas.

<table>
<thead>
<tr>
<th><strong>OLD STRUCTURE</strong></th>
<th><strong>NEW STRUCTURE</strong></th>
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<tbody>
<tr>
<td>MANAGING DIRECTOR</td>
<td>MANAGING DIRECTOR</td>
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<tr>
<td>OPERATIONS DIRECTOR</td>
<td>OPERATIONS GENERAL MANAGER</td>
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<td>ENGINEERING MANAGER</td>
<td>PROCESS SUPERVISOR</td>
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<td>MAINTENANCE SUPERVISOR</td>
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<td>LEADING HAND</td>
<td>MECHANICAL TEAM</td>
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<td>TRADESMAN</td>
<td>PROCESS OPERATORS</td>
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The decision to overhaul the traditional hierarchical reporting lines was taken because the old structure was effectively hampering operations and had resulted in:

- conflict
- different visions between management and workers
- no ownership of outcomes
- minimal communication
• demarcation
• policing rather than coaching.

Our overall strategy was to make Huntsman both profitable and adaptive to the rapid changes that were to become the norm, and at the same time a great place to work. We needed to shift the perspective from “fixed methods of work” and trading off improvements, to rolling processes of “continuous improvement”; to move from “workforce limitations” to “workforce flexibility”, to creating a workforce whose focus is not where to stop, but how to continue and succeed. We needed to build a workforce who were proactive, who would drive change and solve problems before they developed into catastrophes.

One of the technicians, when interviewed after the restructuring, said that as he saw it: “The difference is that in the past when I came to work I took my safety helmet from the peg and replaced it with my brain as I did not need to use it. Now I feel valued and bring my brain to work with me – and my safety helmet, well, I still need that because it protects my brain.”

To bring about the required change, Huntsman needed to change the culture of the organisation. Managers had to become leaders, workers to become members of the team, and unions to become stakeholders. Management no longer own leadership; it is something everyone has to exhibit to perform well in the new structure.

**CHANGING THE CULTURE**

To encourage such a major cultural change, we needed to move the focus from “command and control” to one of commitment. This included all who were part of the Huntsman business: employees, customers, suppliers and unions. The table below illustrates the difference.

To facilitate this shift, we developed a range of programs aimed at giving support to the change process. We were trying to value the past as we moved into the future. To lessen the fear, we arranged the process in bite-sized chunks, which could be delivered at a pace that brought people along and supported them.
All associates received training in:

- conflict resolution
- leadership
- meeting skills
- decision-making
- costing and budgeting
- training skills
- technical training specific to the changing role.

As each team matured to the point where they had the necessary skills to function as an independent unit, we concentrated on upskilling in line with the national training agenda. The maintenance teams were
now training in areas where once we would use outside consultants. This high-skill high-cost work was a twofold bonus. It certainly saved us money but, more importantly, the skills our associates were learning accelerated our development as a learning organisation.

In the operations area we introduced and promoted to our workforce the qualifications available under the national Training Package for our industry to help our technicians gain more confidence in their new roles.

One technician has stated: “The operator’s certificate has increased my knowledge ... I have a lot more extensive knowledge of making alterations to the plant, writing out different permits, a lot more extensive knowledge that the old foremen used to have. That’s given me a bit of knowledge of not so much how one plant runs, but how other plants run and how I affect other plants by making moves on my own plant.”

To the many visitors to our West Footscray plant who ask if we have completed our change process, we reply that we are on a continuing journey. There are stops along the way where we can briefly stop to check what we have become and to look back to what we once were. Nevertheless, the journey must continue if we are to survive in an ever changing environment. In the change process, the journey is more critical than the destination.

Currently we are in the process of becoming a “learning organisation”: an organisation that learns from within and continually improves everything it does. All of our traditional “unskilled” workers now have the opportunity and are being encouraged to receive portable, nationally recognised qualifications. All the technicians in our largest area, the styrene monomer plant, are now qualified to certificate IV. Our warehouse operators are in the process of finalising their training to certificate II and two other plants are working towards certificates III and IV. Our aim is to have all operating staff certificated by 2001.

What we have done has enabled us to survive, for now, but we cannot rest on our laurels. I’m sure our competitors are also exploring new ways of doing business and gaining a competitive edge.
Understanding competence in complex work contexts

PHILLIP CAPPER

INTRODUCTION

The idea of vocational competence has always been highly problematic, and we live in an age when it is increasingly so. The problem is compounded when we attempt to attest to it in the award of qualifications, or use it as the basis for licensing people to perform specific professional activities. In this chapter I suggest that:

a) what we understand to be competent performance is not unitary but rather a fundamentally different process when it occurs in known, repetitive and predictable settings on the one hand and when it occurs in novel situations on the other; and

b) competent performance and the assessment of competence are both activities which are inextricably entwined with the contexts in which they occur.

Uncertainty associated with rapid and constant change is now the predominant operating environment of most enterprises, organisations and communities, but studies such as those of Engestrom (1992), show that the prevailing view of competence and the development of expertise is most appropriate in an environment which is predominantly stable and certain. Therefore a new understanding of the notions of ‘skills’ and ‘competence’ is required for environments of uncertainty and rapid change. Better understanding is needed of the actual cognitive processes involved in competent performance and the development of expertise in conditions of uncertainty, and within the new kinds of team based work organisation which tend to attend such conditions.
A NOTE ON DEFINITIONS

Towards the end of this paper we propose definitions for the terms 'capability' 'competence' and 'expertise'. however, throughout the paper we use terms such as 'information', 'knowledge' and 'understanding', and quote others who use these terms. One of the problems in this field of study is that there is often confusion in the debate because of the lack of a common understanding of what we mean by terms such as 'knowledge'.

When we use these terms we do so with the meanings proposed by Ackoff (1996) which, in summary, are:

*Data.* Symbols which represent objects, events or properties.

*Information.* Data that have been processed into useful forms and descriptions such that questions can be answered about who, what, when, where or how many.

*Knowledge.* Knowing how to make a system work efficiently for an intended outcome.

*Understanding.* The ability to answer the question 'why?' (often about errors) that is to know why the situation is and how its characteristics are related to objectives.

*Wisdom.* The ability to perceive and evaluate the long term consequences of behaviour and to make value assessments about those consequences. This determines the effectiveness of performance.

Some of the authors we quote use these terms with different meanings (for example Maurino et al.). Where this happens we indicate it in the text.

TRADITIONAL CONCEPTS OF SKILL AND COMPETENCE

Plato (Lee, *trans.* 1995) defined skill as becoming adept at doing something by the application of knowledge refined through experience, and it is this view of competence which has dominated Western thinking about the subject ever since.

The model has also determined much of the social organisation of work for over 3000 years and arguably has contributed to and been confirmed by a relatively slow pace of technological change and innovation.
What we now call ‘training’ still occurs predominantly at the pre-entry and induction phase. The dominant operational assumption is continuity and stability. This model has given us Taylorist forms of production and the learning curve as a fundamental management concept, medieval guilds, craft based trade unions and the division of labour.

A review of this dominant model in its varied theoretical, experimental and operational forms, shows that among its core assumptions are that:

1. Expertise is universal and homogeneous. Its technical features exist independently of any cultural or historical context.
2. Expertise consists of the individual mastery of tasks and skills, and once gained is consistent and largely invariable.
3. Expertise is gained through repeated experience and practice.

In recent years research in cognitive science such as that already cited has demonstrated that the model is severely restricted and valid only to the extent that relative stability and certainty prevail.

Maurino et al. (1995) propose a 3 level taxonomy of human performance.

- Skills based performance represents the routine performance of highly practiced, pre-programmed tasks;
- Rule based performance is the application of pre stored rules to a changed, but predicted situation;
- Knowledge based performance involves the necessary use of problem solving to find solutions to novel situations. (Ackoff’s term for Maurino’s ‘knowledge’ is ‘understanding’).

Maurino is discussing the training of aircrew when he proposes that the first two categories represent traditional behaviourist approaches to performance, but demonstrates that as many as 80% of aviation accidents occur when the third level of performance is required, but has not been trained for. However in less structured work environments than airliner flight decks, knowledge based performance (that is, understanding) is precisely what is increasingly required - but rarely trained for - in conditions of change and uncertainty.

The traditional verities have proved extremely resilient. Given that knowledge and skill are the ultimate repositories of power and status, it
follows that the traditional view of skill contributes to a relatively stable social environment, and that the existing power holders have an interest in maintaining that model.

The nature of skills formation and expertise in the traditional model is, therefore, deeply conservative, and does not assist in the achievement of high levels of performance and innovation. John Dewey (1910) first identified this, writing:

Mental inertia, laziness, unjustifiable conservatism, are its [expertise's] probable accompanists. Its general effect on mental attitude is more serious than even the specific wrong conclusions which it has landed. Wherever the chief dependence in forming inferences is upon conjunctions observed in past experience, failures to agree with the usual order are slurred over, cases of successful confirmation are exaggerated. Since the mind naturally demands some principle of continuity, some connecting link between separate facts and causes, forces are arbitrarily invented for that purpose.

More recently writers such as Argyris (1986) have echoed this view, emphasizing the conservatism and aversity to innovation which goes with it.

Recent empirical studies show that ‘experts’ do not always perform impressively at all, and that ‘novices’ habitually outperform experts when a novel or unfamiliar situation occurs. Examples can be found in the studies of Brehmer (1980) and Johnson (1988) and come from settings as wide as office cleaners and high court judges.

Complexity also challenges traditional and individualistic models of expertise. Berlo (1975) is one of many who have identified information retrieval and analysis by groups as having become more important than information retention by individuals.

Moreover the way in which information flows has changed profoundly. The development of individualised, mobile and networked information technologies has turned the predominant model of communications around from one-to-many relationships, to many-to-one and many-to-many relationships. As a consequence, individuals are increasingly being confronted with the need to cope with, and give meaning to, a welter of information
SKILL PARADIGM IN CONDITIONS OF UNCERTAINTY

CHANGE DRIVERS

- Product Customisation
- Rapid Technological Change
- Probability of Job Description Change
- Probability of Job Change
- Knowledge Complexity
- Economic Complexity

CERTAINTY

- Mechanical Technologies
- Procedure and Rule-bound Organisations
- Discrete Tasks are the Unit of Analysis
- Context minimally revealing
- Skill 'Centre of Gravity' psychological/cognitive
- Skill located in the individual
- Specialised Expertise
- Expertise derives from 'doing it better'
- Tasks are done 'the right way'
- Possession of Knowledge, most highly valued quality
- The Learning Curve (Linear World)
- The Empirical Mind
- Teaching

UNCERTAINTY

- Electronic Technologies
- Boundaryless Organisations
- Desired Outcomes are the Unit of Analysis
- Context highly revelant
- Skill 'Centre of Gravity' cognitive/affective
- Skill distributed in the group
- Distributed Multiskilled Expertise
- Expertise derives from the capacity to cope with the unknown or unexpected
- Tasks have many 'right ways'
- Capacity to manage Knowledge, the most highly valued quality
- Double and Triple Loop Learning (Cyclical World)
- Learning

- Working in Teams and Networks
- Distributed Learning
- Distributed Expertise
- Distributed Leadership
- Distributed Management

THE 'MOVING MOSAIC' ORGANISATION

Figure 1: Skills in Conditions of Uncertainty
sources which are either directed to them personally or available to them in a personalised form if managed effectively.

A REVISED SKILLS CONTEXT

Figure 1 summarises the main differences between the traditional way of thinking about skill and the new one we have discussed above.

The work on the nature of expertise discussed requires us to rethink the whole field of vocational and professional skills, and our understanding of competence. In contrast with the traditional view, the revised model reconceptualises competence and expertise as both heterogeneous and collective, and expertise is seen as the capacity to deal with the unknown and unexpected.

SKILL, COMPETENCE AND EXPERTISE AS HETEROGENEOUS CONCEPTS

Even writers who embrace the traditional model of competence often grapple with inconsistencies that are a pointer to the turbulence of the environment. For example, while he asserts the universality of expertise, Holyoak (1991) notes, "there appears to be no single expert way to perform all tasks".

Lawrence (1988, p.230) acknowledges the importance of experiential frames of reference by noting that, "we need to observe how an expert's a priori perspectives operate in interaction with procedures for making sense of data and generating solutions".

So there is a cultural, historical and personal frame of reference which lends individual expertise a "personal style", but which has to be molded into some shared frame in order for people to be able to operate in groups and organisations.

When a task involves interaction with a customer or client, the question of frames of reference becomes even more complex. For example Tuckett (1985) argues that in medical consultations there are two bodies of expertise interacting - the doctor's knowledge of medicine, and the patient's knowledge of his or her own experience and life. Unless these two view-
points are synthesised, optimal solutions to the problem under review will not be found. Any supplier-customer relationship can be viewed in the same way.

One crucial variable is the cultural setting in which the activity is situated. This may mean the societal culture, but more directly it concerns the nature of the organisation itself. Recent new understandings of human factors in aircraft accidents suggest that the organisational culture and management practices of the airline are major determinants of the performance standards of aircrew, (Dismukes, 1994).

But the presence of many different types of expertise is not the only way in which skills, competence and expertise are heterogeneous concepts. In her classic study of technological change, Zuboff (1988) also argues that traditional forms of industrial, clerical and professional work focus on skills which involve physical actions, are focused on the direct physical context in which the work occurs, and are seen as residing in single individuals. The computerisation of work renders this way of conceptualising skills unsustainable. When information is mediated by the electronic machine direct action and physical experience as the core of skills are replaced by analysis of symbolic representations of realities displayed on a screen.

To define this, Zuboff distinguishes between what she calls 'action centred skills' and 'intellective skills'. While this may appear to be restating the old educational divide between "academic" and "practical" strands, the difference is that now both capacities have to be present in most work situations.

**Expertise and skill as collective concepts**

The dominant structures that have arisen around the question of skills - training and qualifications systems, reward systems, job definition, and so on - remain linked to the belief that the basis for thinking about skills is the individual performing a discrete task.

This view treats circumstances where it is not possible to maintain an individualistic frame as being external or environmental constraints on the ideal rather than as evidence that the model might be inadequate. Similarly the model leads to an understanding of motivation towards becoming expert as something entirely individualistic with profound conse-
quences for approaches to motivation and reward in organisations (see, for example, Csikszentmihalyi, 1988; Lawrence, 1988).

However research into catastrophic failures of an unexpected kind in complex technological systems - usually where multiple failures combine to produce a unique situation as occurs in many airliner crashes, or in nuclear power station incidents such as Chernobyl and Three Mile Island, but also in relatively minor events such as inadvertent environmental waste discharges - demonstrates that the individual expert acting alone has a dominant tendency to narrow down the field of analysis when confronted with novel and complex problems.

Recent empirical research suggests that a more fruitful approach to understanding the creative application of skill and expertise is to think, instead, in terms of systems of people in a total environment. This was proposed theoretically by Vygotsky (1978) and Leont'ev (1981) who model skills development and expertise as occurring within an “activity system” consisting of the individual, co-workers, the workplace community, the conceptual and practical tools available and the shared objects of the whole system. Furthermore each discrete activity system is but one node in the larger system of society as a whole.

Vygotsky and Leont'ev’s theories have provoked substantial recent research (for example see Raeithel, 1993) in which work, cognition and expertise are seen as being mediated by the elements of the system, and socially distributed through groups, resulting in the collective activity being more important and robust than the contribution of any one individual. Moreover this model views expertise as being the consequence of participation in the activity system as much as it is the result of individual effort. Competence in such settings simply cannot be understood as an individual attribute. Quite the reverse - attempting to perform as an individually competent actor is an incompetent act.

This is a crucial concept. Vygotsky used the term ‘communities of practice’ to describe mediated activity systems. The term now used in everyday language is ‘self-managed team.’

**EXPERTISE AS DEALING WITH THE UNKNOWN AND UNEXPECTED**

Our traditional view of skills development is that it is progressive, and consists of internalising (getting better at) predetermined tasks. In con-
ditions of uncertainty this does not hold. As Engeström (1992) puts it, "... the crucial learning in expert activity systems is learning what is not yet there". We have already discussed the consequences of this for how we must revise our view of what is meant be 'expert' and 'novice'.

**Organisational Transformation**

We have now examined the nature of skill, expertise and cognition in conditions of uncertainty. Such a review is directly relevant to the current debate in the management literature about the need for transformation in organisations. This pantheon includes the shift to flexible specialisation, customer focus, empowerment, flattened management, self-managing and self-directed teams, and continuous organisational learning. These changes are mirrored in a need to shift from master-novice relationships towards those which are grounded in shared critical inquiry in the conduct of which it is held likely that the 'novice' will have much of value to impart to the 'expert'.

As Applebaum and Batt (1993) have demonstrated in the United States, while it is now common for these notions to be articulated by organisational leaders and managers, it is relatively rare for them to have mastered the behavioural changes necessary to operationalise the concepts. While almost everybody *articulates* the principles of the new model, they *continue to operate* out of the old one. This occurs precisely because expertise is expressed as a conservative and change-averse phenomenon in the way we have described.

**Defining Skills and Becoming Competent in Conditions of Uncertainty**

It is now conventional to talk about "hard" and "soft" skills, to distinguish between observable psychomotor and cognitive skills that have dominated in the past, and those processes, cognitive and affective skills that are becoming more important at present.

However, there is a profound epistemological paradox in the use of the terms. As Motorola University's Leo Burke has observed, "The shelf
life of a software engineer's skills is about two years." The point here is that, increasingly, the "hard" technical skills are becoming ephemeral requirements, whilst the process skills, despite being called "soft", are becoming the enduring requirements of most jobs. In fact they are not "soft" skills at all.

The problem is that it is often difficult to measure, certificate, observe, or even define these skills. In the business environment 'difficult' almost always means 'costly' and therefore there is increasing reluctance to commit to any rigorous attempt to assess and certificate such skills. Nevertheless it is now becoming common for agencies or organisations to attempt to describe what is needed in uncertainty.

An emerging trend is for "hard" skills acquisition to be given a "shelf life", in recognition of the obsolescence attached to them. This has long been the situation for aircrew, but there are signs that it is spreading into other fields as well.

However such models fail to take account of the significance of the work group itself as the locus of learning in activity systems operating under uncertainty. Berryman (1992) has proposed that while traditional apprenticeships have the problem of embedding conservative and change-resistant expert practice into the exercise of skill, the model nevertheless has some features which, adjusted for uncertainty, remain highly functional. She lists these features as being:

- Work is the driving force.
- Apprentices start with skills that are relatively easy and where mistakes are least costly.
- Learning is based on the ability to do, rather than the ability to talk about something.
- Standards of performance are embedded in the work environment.
- Teachers and teaching are largely invisible in the formal sense.

The challenge is to apply these characteristics to an environment of continuous learning in which everybody is an "apprentice" from time to time, and the mode is, to use Dewey's terms, "experiential" rather than "empirical". The response of Berryman and others is what they have called "Cognitive Apprenticeships", in which symbolic, analytical and process skills
form the locus of attention, and communities of practice that learn together are the ideal outcome. In short the shift is from an emphasis on personal understanding to collective knowledge management leading to group level understanding.

**THE CONCEPT OF WORK TEAMS**

Earlier we referred to Maurino's three performance levels. These are crucial to an understanding of the vast confusion that surrounds the concept and definition of work teams. In brief, skills based performance can often be carried out by individuals (e.g., using a screwdriver) but may sometimes require collaboration because of the complexity or physical demands inherent in the task (e.g., flying an airliner, lifting heavy weights). This sort of collaboration is often described as teamwork, but if this is so it is only a very limited form of teamwork to the extent that each individual only has to be able to perform a specific role.

Rule based performance can also be an individual phenomenon, depending on the level of expertise of the individual (i.e., the extent to which they have experience of enough patterns to be able to accurately identify the rule to apply in a given situation). However rule based performance is more likely to produce optimal outcomes if there is an opportunity for two or more people to discuss which pattern is appropriate for the situation that has been encountered and if the discussion that takes place is not distorted by extraneous social factors which distort the evaluation of any one individual's contribution. This represents a more complex, but still constrained, concept of what constitutes teamwork.

But in the case of knowledge (Ackoff's 'understanding') based performance the situation is reversed. Knowledge based performance will generally be sub-optimal if engaged in by an isolated individual, regardless of the level of formal expertise or experience of that individual. Knowledge based performance can only be optimised by the use of critical inquiry and collaborative discourse in groups. It is the expansion of the need for knowledge based performance in turbulent work environments that has led to the growth in popularity of the notion of teams (or rather its rediscovery. Teams were and are unfashionable only in the context of Taylorist scientific management models of work design). However
it is the failure of many of those involved in team development to recognise the different levels and types of team performance described here that has resulted in high failure rates in team based work reorganisation projects.

At the conclusion of our own research we speculated that the concepts of expertise, skill and skills formation required in circumstances of uncertainty are not very new at all. 80 years ago Dewey clearly articulated the problems of conservatism and linearity associated with dominant operational assumptions about skill and expertise. For his part Deming was writing about the organisational forms required, and how people should be encouraged to perceive their own roles in those forms, over 50 years ago.

Deming and Dewey were both savaged by the behaviourists of the 60's and 70's, and the human resource development strategies which evolved from behaviourism. Both are now enjoying something of a renaissance, albeit reinterpreted in the light of the implications of developments in information systems, computer-assisted production and design technologies, and the potential of multimedia-aided learning. The industries of learning and research are themselves subject to acute conditions of uncertainty, and final "correct and universal" solutions to organisational and management questions must be treated with scepticism.

Nevertheless the current dominant concepts associated with competence seems to us to be flawed because they:

1) Focus on the skill attributes of individuals at the expense of considering how workplaces might be structured and managed for ongoing skill formation in the present and future business environment. In other words, the debate tells us little about the relationship between skill formation and the organisational culture, structure, operating systems and production processes that characterise leading edge organisations competing in a global economy.

2) Concentrate on formal, school or tertiary-based education and training, at the expense of considering everyday work-based learning needed to create enterprises that are customer-focused, flexible, innovative and cost-efficient. As a consequence, it ignores the issue of how work should be designed to optimise the con-
continuous improvement, or learning, that is central to TQM and JIT production and customer service systems.

3) Address the skill levels of entry level employees, or those out of work, at the expense of considering the knowledge, values and skills that managers, supervisors and staff require to create workplaces that facilitate continuous learning.

4) Focus on the acquisition of technical skills by an individual, rather than considering the organisational and team skills needed for the self-managing production and cross-functional teams that characterise leading edge companies.

5) Have not yet begun to grapple with the implications of the 'learning organisation' concept. In particular, inadequate attention is paid both to i) how people learn in the workplace, especially in a team and; ii) how the design of organisational structures might facilitate learning and appropriate skill formation if it is informed by understandings of how learning occurs.

ASSESSMENT CONTEXTS

We now move to the second proposition in our introduction. In this we examine the context in which workplace assessment occurs, given the generic context of complexity and turbulence, and the implications for how we think about competence, discussed in the foregoing section of this paper.

THE POLICY CONTEXT

There is a significant gap between the policy informed assumptions of those that design qualifications systems and the practical assumptions about those same systems of those in the workplace. This gap *practically* distorts every single shop floor assessment event. But both perspectives are fundamentally political in that the process of workplace assessment and its outcomes are as much to do with the distribution of power and social status in society as it is about technical measurement of competence.

In New Zealand as elsewhere labour market flexibility has been seen as a crucial component of the government's economic strategy. While some
ideological positions have emphasised *quantitative* flexibility (the capacity of employers to determine the number of workers they need and the hours they shall work with the minimum amount of external regulation), others have emphasised *qualitative* flexibility (creating a broad capacity for workers to upskill, cross-skill and multiskill). These are ideological positions at least as much as they are practical ones.

For education and training policy makers reforms in educational and vocational education and qualifications have been a tool to serve the qualitative purpose. At the time New Zealand’s National Qualifications Framework (NQF) was being designed most commentators (including myself) believed that this primarily meant that workers should be able to adapt to skills requirement changes within their broad field of work. Later this was extended to accommodate movement across different skills areas to enable people to cope with complete changes in career direction.

Changes in assessment have been seen by education policy advisors as a necessary consequence of the fundamental change in emphasis outlined above because, as Jim Strachan and Liz Bowen-Clewley (*pers. com.*) have argued, ‘all countries now recognise that changing educational aims without changing assessment is an exercise in futility.’ My response to this was to ask ‘What if we reverse this statement and think instead about the futility of changing assessment without changing educational aims?’ I ask this because I believe that in the public perception in England, Scotland, Australia and New Zealand, this is what has happened.

But there is an uncomfortable difficulty for the education community here. Their preoccupation with how we are to think about the validity, consistency, comparability and portability of qualifications, and how to address the lack of predictive strength in educational assessments, assumes that the sole purpose of certification is to attest to competence. The problem is the *cultural* burden that educational assessment carries. In reality it performs the roles of gatekeeping for access to scarce commodities (higher education), social status and power, and employment gatekeeping. These functions have no necessary connection with their capacity to perform their alleged technical purposes. The turmoil of debate concerning vocational qualifications is more about the cultural and social utility of qualifications than it is about technical matters. On the one hand the *education policy* community has gone through a process of thinking about educa-
tional aims to serve economic goals, and about certification and assessment to match such changes. But despite the political rhetoric the public in those countries have not.

Our research has indicated clearly that for the public certificates remain the tangible product that the education client carries away from the education shop. How those products are allocated are of fundamental interest and importance. The abstraction of learning is difficult to picture and so carries less significance in determining attitudes and behaviour. Changing the allocation rules matters. Between 1984 and 1987 the New Zealand government attempted to change the rules using a social justice argument. Since 1987 the rationale for change has been the imperatives of a competitive economy. In fact the contrary arguments remained the same in both cases, and were driven by the belief that those who are currently advantaged by the ways in which certificates are allocated should continue to be so. The test of this lies in the perverse behaviour of those who assert most vociferously the need for economic relevance. For the most part they do not actually accept the logical policy consequences of such a position, opting rather for mechanisms which perpetuate the status quo in the allocation of credentials.

It follows that in the minds of the public at large educational aims have not in fact changed very much, nor ought they to. To truly change the aims of a public and universally accessible education and training system is a powerful act of social engineering. The policy approach in New Zealand and elsewhere has in reality been to use assessment reform to drive educational change, which in turn might drive social change. The current backlash indicates the problems of such a strategy. For successful assessment reform to occur on the scale attempted in New Zealand and elsewhere, it must form part of a comprehensive plan for human capital development for which a strong political will exists.

If all of this is so, then it follows that any attempt to deal with criticism which does not take into account all the cultural functions of educational certification is doomed to failure. When an assessment event takes place in the workplace it may well be that those who designed the requirements for the vocational qualification may have been motivated entirely by the desire for a technically optimal process. But the individual assessor and candidate using these tools behave in practice in ways which are
inextricably filtered through the baggage which they carry about the social and cultural significance of the act in which they are both engaged. Educational assessment and the award of qualifications is not, and can never be, a culture and values free exercise.

**THE WORKPLACE CONTEXT**

I have argued that at the level of society at large educational qualifications are as much about the allocation of status and power as they are about determining competence. This argument is immediately and practically mirrored in the use of qualifications in workplaces. Within the world of work qualifications perform a role in selection, in determining pay rates, and in selection for advancement. Superficially these are all decisions about the competence that qualifications are supposed to record. Our research demonstrates that this is very rarely so. At work education and training qualifications appear to be used more often as a filtering device than as an indicator of competence. Once the qualification has been used to place an employee in a job, only then does the task of achieving contextual operational competence begin.

Our work, and that of others, suggests that in New Zealand at least, workplace assessors don't perceive any problems with their task. The reasons for this remarkable contrast with the endless agonising of educators is easily understood when one has interviewed, as we have, a substantial number of assessors. Workplace assessors only know about, and are only concerned with, competent performance in the context of their own workplace. Our work in the Plastics and Horticulture industries in New Zealand suggests that the concepts of portability and fairness are not part of the mental model of most workplace assessors.

When we raised these questions with our assessor respondents they invariably found the ideas simply bizarre and irrelevant. The issue was this, and only this, “Can s/he do the job?” with “Can we award this unit standard on the basis of the answer to the first question?” coming in as subordinate. A predictable, if not inevitable, cognitive consequence was their appropriation of the workplace assessment tools with which they had been presented and their adaptation to the specific context of their
own workplace. This involved discarding those elements which related to the concerns of educators and the imperatives of a national qualifications framework.

Educators, on the other hand, have to be concerned with fairness and portability. Whereas in the workplace assessing worker competence is only one element of a quality assurance strategy whose ultimate test is the product or service delivered, in an educational institution the certification is the product, and assessment is the heart of quality assurance. The social gatekeeping function of educational institutions absolutely requires them to be able to demonstrate fairness and portability. The intransigent problems concern what it is that constitutes fairness, and the fact that the vast bulk of cognitive research suggests that the portability of technical skills across contexts as a universal educational project is a chimera.

Furthermore educators are necessarily assessing performance outside a specific operational context, whereas workplace assessors are necessarily working within one.

It is noteworthy that these problems do not go away even when the objectives of the employer and those of the education system intersect. Large organisations in Australia and New Zealand are often fully committed to recognising the competence of their own employees against a system of national standards. This is sometimes a function of contract negotiations, and almost always part of the new industrial compact in a world of quantitative labour market flexibility.

To use one example, in our case study of the food processing plant of Watties Frozen Foods (WFF) (now Heinz-Watties) at Hornby, Christchurch, we concluded:

a) Continuous change and continuous learning represents a break from traditional models of apprenticeship and mastery. In traditional models a trade or profession was learned, and then one became a qualified operative. The pace of change was slow enough that new learnings were acquired through occasional top up courses. Fundamentally once a person 'had their ticket' they were not regarded as learners any more. This is no longer the case in a firm like WFF.
b) The nature of team work organisation requires a breakdown of traditional trade and job demarcation. Not only do employees continuously learn vertically (that is learn about new innovations in their core speciality) but also horizontally (that is they learn aspects of other skills and jobs as circumstances in the team dictate).

c) A further aspect of self managing team settings is the placement of responsibility for problem solving with every employee. When a machine malfunctions it is no longer automatic to close it down and call in an engineer. If the operative believes that he or she can deal with the problem then he or she is likely to act unilaterally - and is encouraged to do so by the company culture.

d) The fluid business environment has altered the nature of the compact between employer and employee. Whereas in the past the compact has been founded in a principle of continued and secure employment in return for commitment to training on the part of the employee, WFF has shifted to an increasingly common position where the compact offers employability in the labour market as a flexible and multiskilled individual as the reward for training commitment.

e) Skills based contracts - introduced to support the environment described - break down traditional distinctions between skilled and unskilled workers and replace them with a continuum. This continuum actually extends across the salary/hourly rate divide, as demonstrated by the tension articulated by respondents at WFF concerning pay rates for those shifting into managerial positions.

But at Watties we found the same experience as Bishop (1993) found at the Boyer, Tasmania plant of Australian Newsprint Mills. Even where company policy was well aligned with the goals of national vocational qualifications, supervisors - who are those most likely to become assessors - generally had a control model of their relationship with novices, and tended to make day to day assessment decisions on the basis of an intuitive appraisal of a person's attributes. This was a major problem at the Boyer Mill. The company undertook a major assessor training programme to reorient them to a model where they saw the relationship as developmental, and their job as an assessment activity to help build commitment
to personal development by the novice. In other words initially the micro-politics of the team or shift was more robust than the company training policy. Large firms such as ANM sometimes - not always - make efforts to overcome this. In our research experience small enterprises virtually never do.

The imperative to bridge the education policy and workplace contexts (and indeed that of individual motivation discussed in the next section) leads to a heavy and confusing burden being placed on assessment for qualifications. Australia's Office of Vocational Education and Training (OVET) tells the public on its home page that the purposes of workplace assessment are that it:

- Provides recognition against nationally endorsed industry and enterprise standards of the knowledge and skills employees possess.
- Helps employers to identify the areas where staff may need further training to improve business performance.
- Provides a career path for employees.
- Provides employees with nationally recognised qualifications.
- Increases employees' self confidence and motivation to work.
- Avoids duplication of training effort.

This list is astonishing but could be replicated in any of the countries deeply into competency based national systems. The question is whether such a list is supposed to describe the purposes which are all applicable to all workplace assessments, or whether it is a list of possible purposes some of which might be applicable in any given assessment event. If it is the first, then the contradictions imposed on the activity of workplace assessment are impossible to resolve. If it is the latter then consistency of assessment practices across different workplace contexts is impossible. A list like this, in attempting to be all things to all people, ends up as reducing national standards and consistency of assessment to a myth.

### The Contexts of the Assessor and the Candidate

Assessors and candidates are people who come together to undertake a specific activity which is almost always a minor aspect of their working
lives, and represents the temporary adoption of roles which are a very minor aspect of their overall workplace functions, roles and identity. It is therefore inevitable that both parties superimpose those other more significant contextual factors on to the conduct of the assessment activity.

There is no need to dwell on this truth because we have already alluded to it in generic terms in our discussion of the organisational context. There are an infinite number of ways in which the assessment event is coloured by the micropolitics of particular workplace relationships, the personal doubts and insecurities of the two actors, and the accumulated cultural baggage from the present and past workplaces, and their external social world.

Nevertheless these factors must be a crucial concern of those involved in the assessment of workplace performance for purposes of an allegedly reliable, valid and transferable qualifications system. Professional educators have problems enough in this area, but it is part of their professional responsibility to do their best to overcome the associated distortions that result in the assessment of students. But for the most part workplace assessors have no such professional imperative. They simply do the job within the existing workplace context. High levels of distortion are inevitable.

**Assessing competence in complex contexts**

We have argued that competence is a problematic concept in complex settings, and that expert performance is even more so. Both must be viewed as context specific in complex settings. We have also argued that the assessment activity is also a highly context specific activity. These variables require us to be careful about claiming validity and transferability for any qualification. Above all they call into question the use of the word 'standards' associated with such qualifications if the performances described by the qualification are at Maurino's knowledge based level, or if they are at the rule-based level as performed in turbulent contexts.

On the other hand it is absurd to conclude that we must therefore abandon the effort. Nobody would accept the proposition that we should not make judgments about competence before we decide who to allow to install electric wiring in our house, let alone who will fly our airliners
or transplant our hearts. But what we do need to remember is that despite the most rigorous licensing procedures houses still burn down because of electrical wiring faults, vastly experienced airline pilots still fly into mountains, and patients still die on the operating table because of human error.

If we understand the issues discussed here, factor them into the design of assessment systems, and are careful only to claim for the outcome what it is legitimate to claim, then we can still maintain a workable system. Above all employers and employees must recognise that at the knowledge based level of performance, or in turbulent settings, formal qualifications only ever indicate capability - and that competent performance in those settings requires continuous and collaborative learning as an organisational principle.

In conclusion we propose two related taxonomies as a contribution to such understanding. Working with Liz Bowen-Clewley we have produced a model hierarchy as a framework for thinking about workplace competence in turbulent conditions. Most of Figure Two is self explanatory, but note the special definition of 'expertise' This hierarchy does not allow the high grade performance of predetermined tasks to be dubbed 'expert'. In turbulent environments it is essential to be able to apply existing knowledge to the solution of novel problems. Sometimes 'expertise' in dealing with the problem to hand resides in people who superficially appear to be inadequately experienced, and sometimes the supposedly 'expert' practitioner is, in fact, a person who approaches novel situations with fatally channeled thinking.

This model can be better understood in its implications for workplace assessment if we refer to Maurino's three levels of performance and consider how we might identify each in assessment activities. A proposed model based on such an analysis is shown in Figure Three.

We can thus come to understand that different classes of performance and different orders of environmental turbulence present different challenges. From our field observation it seems that much poor assessment practice can be understood as a failure to recognise the category of performance being assessed, what constitutes best assessment practice for that category, and what can not or should not be assessed at the individual level.
Figure 2. Model of a hierarchy of workplace competence based on cognitive theory.

Figure Three also shows us clearly that at the knowledge based level of performance we can never adequately guarantee the required performance by any licensing or qualifications system. And yet it is precisely this level of performance that the most critical workplace incidents are encountered. At this point educational assessment theory meets organisational theory. In workplaces which have properly designed themselves for complex environments:

a) the context is that of communities of practice and distributed learning. In such workplaces *individual* performance appraisal is considered destructive of the collective approach to performance that is now regarded as best practice. There are real difficulties in the apparently contradictory signals of an individualised qualifications system;
<table>
<thead>
<tr>
<th>Transferability between contexts</th>
<th>Attributable to an individual</th>
<th>Assessment of capability in workplace</th>
<th>Assessment of competence in the workplace</th>
<th>Assessment of expertise in the workplace</th>
<th>Assessment evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills-based performance (routine performance of highly practiced, pre-programmed tasks)</td>
<td>Strong but contextual effect exists</td>
<td>Usually</td>
<td>Capability can usually be confirmed at a high confidence level, but context effect means lack of capability cannot be confirmed</td>
<td>Competence can usually be confirmed at a high confidence level, but context effect means that lack of competence cannot be confirmed</td>
<td>Expertise and its absence can be confirmed at a high confidence level</td>
</tr>
<tr>
<td>Rule-based performance (the application of pre-stored rules to a changed, but predicted situation)</td>
<td>Weak - contextual effects strong</td>
<td>Sometimes</td>
<td>Capability can usually be confirmed at a moderate confidence level, but context effect means lack of capability cannot be confirmed</td>
<td>Difficult to confirm, impossible to confirm lack of competence</td>
<td>Expertise and its absence can be confirmed at a moderate confidence level</td>
</tr>
<tr>
<td>Knowledge-based performance (the necessary use of problem solving to find solutions to novel situations)</td>
<td>Very weak - contextual effects decisive</td>
<td>Contra-indicated (individual application of knowledge based performance will usually produce a sub-optimal result)</td>
<td>Capability can sometimes be confirmed at a low confidence level, and the more turbulent the work environment the more likely this is to be possible. Lack of capability cannot be confirmed. Attribution to an individual, neither possible nor desirable</td>
<td>Extremely difficult to confirm through systematic assessment - only possible by opportunistic use of operational evidence. Lack of competence cannot be confirmed</td>
<td>Cannot and should not be confirmed in or attributed to individual performance. Potential of an individual to contribute discoverable through tests of professional knowledge and assessments of personal characteristics</td>
</tr>
</tbody>
</table>

Figure 3. Proposed Taxonomy of Characteristics of Levels of Performance and Implications for Workplace Assessment (using Maurino’s Performance Categories).
b) innovation is valued, which is concerned with simultaneously not accepting existing standards of performance and standard operating procedures as fixed, and tolerating the transaction costs of experimentation. However in safety critical situations protocols for experimentation are clear and risk management procedures are robust;
c) learning curve approaches to performance measurement are replaced by iterative processes of learning and problem solving as themselves being the measure of performance.

It is these characteristics of work design and management practice which give the best guarantees of competent performance at the knowledge based level. Coincidentally the social and cultural relationships that are the essential foundations of such workplace practices are also those which are most likely to foster the sorts of relationships between assessor and candidate which produce the most robust and reliable assessment activity at any performance level.

**BIBLIOGRAPHY**


Judgement and the Law Society of NSW
Specialist Accreditation Scheme

PAUL HAGER

This chapter outlines an example of assessment against workplace performance standards involving the accreditation of specialist solicitors by the Law Society of NSW. The chapter then discusses the strengths and weaknesses of this accreditation scheme, as identified by subsequent formal evaluations, in terms of a theory of successful workplace learning as a growing capacity to make sound context-sensitive judgements. This judgement theory of workplace learning is currently being elaborated in other work by the author.

FEATURES OF THE LAW SOCIETY OF NSW
SPECIALIST ACCREDITATION SCHEME

In 1993 the Law Society of NSW created the designation of specialist lawyer in four specializations, viz. family law, criminal law, small business law and personal injury law. The aims of this scheme were stated as:

• offering the public and the professions a reliable means of identifying solicitors as having special competency in an area of practice;
• encouraging improvement in the quality, speed, and cost of legal services;
• providing practitioners with an incentive and opportunity to improve their competency. (Armytage, Roper & Vignaendra 1995, p. 219).

The Law Society proceeded to develop integrated performance or competency standards for each specialization and then in each case devised and implemented an assessment strategy based on the performance stan-
Prior to the adoption of performance-based assessment for the accreditation of specialist lawyers, the proposal had been to use the traditional methods of unseen examinations and referees' reports. This proposal attracted considerable criticism from both inside and outside of the legal profession, mainly on the grounds that it would do little to identify those lawyers with a genuine capacity to perform at the specialist level in the identified areas. Accordingly, in response to this concerted criticism, the then risky strategy of developing and assessing against integrated performance standards for each of the specializations was adopted. (For details of this process see Gonczi, Hager & Palmer 1994). However the scheme quickly gained wide acceptance with subsequent formal evaluations confirming its effectiveness in achieving its stated aims. This initial success led the Law Society of NSW to establish further specializations in subsequent years. Now more than a dozen specializations have been accredited and the scheme has spread quickly to other Australian states in some specializations such as family law and immigration law.

In a typical specialization, the assessment strategy features a knowledge exam and referees' reports as well as two other assessments that focus on performance within the specialist area. For example, in family law candidates are required to carry out simulation exercises centred on conducting a first interview with a person acting in the role of a client. This simulation, of approximately 60 minutes duration, is videotaped and the videotape assessed by the examiners. Various versions of this simulation have been constructed so as to assess a wide range of the contents of the performance standards including those related to interaction between the solicitor and the client, taking instructions and giving advice, assessing facts and legal options, canvassing the options with the client, and developing the initial plan. Underpinning attributes tested by the simulation include communication, evidence gathering skills, and acting ethically, as well as various kinds of knowledge and its application. Thus the simulation was developed with many elements and performance criteria from a variety of units of the standards in mind. While depicting different clients, situations and problems, the range of simulation exercises that have been developed all have the same basic structure: an immediate need; long term issues; information not disclosed unless appropriate questions are asked; client's hidden agenda; presentation of a problem that requires
non-legal solutions, (including some of a religious/cultural kind that require sensitive handling); an ethical issue; and a query on costs.

In family law, the other performance-based assessment activity requires the candidate to complete specified tasks on a mock file compiled by the examining committee. This provides assessment evidence on various aspects of the performance standards, including legal analysis, presentation of various options to the client, and preparation of court documents in a timely way. The combination of simulated client and mock file might be taken to suggest that a more valid assessment strategy would employ a real client and a real file. It is true, in general, that assessment of performance of real work situations is more valid than of simulated work situations. However practical and ethical considerations, the relative weight of which varies with the nature of the occupation, can sometimes tip the scales in favour of simulations. In the medical and paramedical professions, for example, simulated patients are likely to be much less satisfactory than real patients for purposes of performance assessment. However, simulated clients have distinct advantages in the field of law. Provided that the person playing the role of the client has been well trained, thereby minimising relevant differences from a real client, it is possible to employ carefully designed cases that are much richer from an assessment point of view than are typical real cases. The experience of the Law Society of NSW has been that employment of professional actors to play the role of the client works very satisfactorily. Thus a well-designed simulation and mock file can readily yield data that is much more cumbersome to obtain from an appropriate combination of real cases.

This sort of combination of performance assessment supplemented by more traditional types of assessment that is being used to accredit specialist lawyers, is not, of course, something totally new. Clinical assessment of this kind features in the final years of the university degree courses for many health-related professions. String quartets and the like commonly fill vacancies by trialing in actual performances applicants selected by interviews. Driving licences are typically issued on demonstrated capacity to drive in actual road conditions with successful completion of a knowledge test being a pre-requisite for taking the performance test. It is noteworthy that whatever the limitations of assessment procedures of this kind, suggested improvements usually relate to making the performance
assessment more demanding rather than to replacing it by traditional exams. What is most novel about the law example is how the performance assessment was developed from integrated standards. The performance-based assessment strategy ensures that evidence is collected on all aspects of what is considered crucial to overall effective performance in the respective specialist areas.

The Law Society of NSW Specialist Accreditation Scheme was formally evaluated in its first years of operation and regular evaluations have continued as the scheme has grown both in size and complexity. The early reviewers (Armytage, Roper & Vignaendra 1995) used focus groups and a survey to assess the perceptions of clients. While they cautioned readers to be careful in interpreting their results, they concluded that there had been an increase in expectations of clients as a result of the scheme and that there were high levels of satisfaction among clients:

“Overall the data reveal an increasingly discerning clientele whose expectations of service have consistently risen and have almost universally been satisfied or exceeded by their specialists. These findings reflect the ultimate performance indicator [their italics] for the accreditation program which is client satisfaction with specialists’ service: and more specifically they demonstrate the overall effectiveness of the assessment process in providing a mechanism for the identification of solicitors as having special competence in an area of practice” (p. 17).

When asked whether the assessment had influenced their practices, 62 per cent of the successful candidates felt that it had. In the area of Wills and Estates the proportion was as high as 79 per cent. The lawyers identified a range of areas such as: review of office procedures; increased awareness of precedents; heightened awareness of time limits in practice; increased knowledge of law and legal principles. This is strong evidence of the consequential validity of the performance-based assessment scheme.

Another consistent finding of the evaluations has been that those accreditation methods which concentrate on the performance of ‘real’ tasks meet with strong satisfaction while traditional written tests meet with relatively low approval. In 1994 for example, in the Personal Injury specialty, the mock file (a task which asks solicitors to undertake research, draft pleadings for court, organise a brief for barristers, etc) was rated by 53 per cent as likely ‘to a great extent’ to give them an opportunity to
demonstrate their ability - this was the top of a five point scale. Taking
the fourth and fifth points together, the satisfaction rates were 91 per cent
for the mock file. The same level of satisfaction for the written test of
knowledge was 13 per cent for the fifth point of the scale and 41 per cent
for the fourth and fifth points combined. In the same year in the Family
Law speciality, satisfaction rates were 19 per cent and 1.6 per cent for the
top of the scale for the mock file and written knowledge test respectively.
For the fourth and fifth points of the scale combined, satisfaction levels
were 81 per cent for the mock file and 37 per cent for the written test
of knowledge. Similar results are available for the other specialities.

Significantly, one hundred percent of candidates felt that the assess­
ment experience was educational in the sense that it gave them the
opportunity to exchange ideas with colleagues, to revise and to get up
to date. Given the consistent finding that the candidates generally find the
written examinations to be the least satisfactory component of the assess­
ment process, some modifications have been introduced by various spe­
cializations. The main problem with the written examinations is that
handwriting well-argued answers to a series of probing questions in a closely
restricted time frame (three hours) is not a performance that is represen­
tative of a solicitor's day-to-day work. For many candidates, it is twenty
or thirty years since their last experience of written examinations. Con­
sequently examination nerves are a problem that has been addressed in
several ways. Some specializations have introduced take-home exams that
include a signed declaration that the submitted answers are the candidate's
own work. Naturally, this leads to much better answers than the super­
ficial ones commonly produced in the traditional alternatives. Other
specializations have adopted the strategy of providing candidates with a
pool of exam questions some of which will be in the actual examination.
For instance personal injury law circulates sixty questions, twenty of which
will constitute the first section of the exam paper, the other two sections
remaining unseen. There are obvious educational benefits from the pool
of questions being circulated in advance, benefits that are independent of
the examination itself.

These developments might lead to a questioning of whether tradi­
tional written examinations have a valid role in performance-based assess­
ment. It can be argued that knowledge is better assessed in application
rather than in isolation from application. Certainly the administrators of the Law Society of NSW Specialist Accreditation Scheme repeatedly find that "knowledge keeps creeping into application and vice versa". However those responsible for the various specializations seem to be convinced that specialist solicitors need to demonstrate a significant level of legal knowledge and that examinations are the most efficient and practical way for this to be achieved. If that is so, there appears to be no inconsistency in having examinations as one part of a performance-based assessment scheme.

WORKPLACE LEARNING AS GROWING CAPACITY TO MAKE SOUND JUDGEMENTS

The learning that is being assessed by the Law Society of NSW Specialist Accreditation Scheme is, of course, learning that has been acquired largely from the experience of engaging in professional practice. That is, this learning is a type of workplace learning. Recent years have witnessed a burgeoning of interest in workplace learning, particularly in its informal manifestations (e.g. Beckett 1998, Hager 1997). One of the clear findings of this work is that an unusually large number of variables influence workplace learning (Hager 1997). Such variables include:

- the workplace environment/culture
- authentic learning experiences
- quality of learning materials
- role of language and literacy
- company/business size

This creates the problem of 'far too many variables' for researchers wanting to investigate workplace learning. What is needed is some way of conceptualising workplace learning that draws attention to the main features of the phenomenon, while at the same time being sensitive to the potential contributions of the many variables that have been shown to influence workplace learning. It is proposed that conceptualising workplace learning as a growing capacity to make judgements (Beckett 1996, Hager 1996a) incorporates these many variables while providing a manageable means of investigating workplace learning empirically.
The claim is that making judgements is a central learning activity of people in the workplace. It is hypothesised that making better judgements represents a paradigmatic aim of workplace learning, and that a growth in such learning represents a growing capacity to make appropriate judgements in the changing, and often unique, circumstances that occur in many workplaces. Of course, the extent to which workers make judgements during the course of their work depends, amongst other things, on the way that the work is structured and organised. An assembly line, e.g., is organised so that workers will exercise minimal judgement, therefore there will be little or no workplace learning. The much discussed 'learning organisation' maximises the exercise of judgement, and, hence, learning. Most jobs fall somewhere between these two extremes. It is assumed that by theorising workplace learning in terms of what people actually do (make judgements), we can then take account of the effects of the many variables that influence workplace learning via their influence on such judgements. It turns out that the many variables that influence workplace learning are just the kinds of factors that are taken into account when judgements are made.

For the purposes of this paper, we can say that judgement involves deciding what to believe or do taking into account a variety of relevant factors and then acting accordingly. More generally and technically, according to Lipman "[t]o judge is to judge relationships, either by discovering relationships or inventing them." (Lipman 1991, p. 16). However, following Dewey (1938), I want to stress that judgements are directed at action rather than truth as such. Judgements aim to bring coherence and relative stability to a given situation. Thus judgements are about reacting to or changing concrete situations. That is, they are practical judgements. This means that although propositions (e.g. true or false statements) play some role in judgements (since a judgement will typically involve the affirmation or denial of any number of propositions), they are a subsidiary part of judgements. As well, judgements are shaped by a range of other factors that are not essentially propositional such as conative (of the will), emotional, attitudinal, and value commitments.

This understanding of workplace learning via judgements can be extended by ideas from Dewey's hitherto neglected logic (Burke 1994) and its account of judgements. Traditionally, logic was concerned centrally with universal propositions, which were also the mark of the highest forms
of knowledge. In this scheme, judgements were also propositions. On this approach, workplace learning is of little interest, since, at best, its particularities are but distantly connected to the ideal of universal knowledge. Thus the problem becomes one of accounting for how practice is connected to theory. Notoriously theory/practice accounts of workplace judgements have repeatedly failed (Hager 1996b).

Dewey's logic, however, is a logic of action which repudiates the theory/practice dichotomy (and cognate dichotomies such as discursive vs practical). It also distinguishes propositions from judgements. With the development of artificial intelligence, robotics, etc. the field of logic is finally turning its attention to the logic of action and Dewey's ideas are starting to receive serious scholarly attention (Burke 1994). In a logic of action, vocational (or professional) knowledge is no longer placed at the periphery of knowledge. Such a logic does not invert the order of traditional logic and privilege the particular over the universal and the practical over the discursive. Rather it incorporates all of these and rejects as false dichotomies theory/practice, universal/particular, discursive/practical, etc. (Hickman 1990).

The theoretical ideas underpinning the account of workplace learning as development of judgement capability, which I recommend, are in need of further refinement. However, it is possible to extract from this work a number of main features of workplace practical judgement against which possible strengths and weaknesses of the Law Society of NSW Specialist Accreditation Scheme can be discussed.

**Main features of workplace practical judgement and their role in the Law Society of NSW Specialist Accreditation Scheme**

1. **Workplace practical judgement is not simply "rational"—rather it often involves the full gamut of human attributes**

Workplace practical judgement integrates the cognitive with the practical, ethical, moral, attitudinal, volitional, etc. As well the specialist solicitor is not simply a disembodied mind. Many requirements of such specialists hinge on their capacity to relate effectively to the client. This in turn points
to the importance of such matters as body language, eye contact and other aspects of effective communication. So the workplace practical judger is as much an embodied judger as a rational judger. Thus workplace practical judgement is holistic in at least two clear senses.

This holistic feature of judgement has interesting links to the recent international interest in higher order generic attributes, such as collecting and analysing information, communicating ideas and information, planning and organising activities, and working with others and in teams. These generic attributes are as much attitudinal and volitional as they are cognitive. They focus on what people do in diverse life situations. The main findings of research on the occurrence of these generic attributes in diverse life situations, including the workplace, is that they cluster and integrate in seamless holistic ways. They are also extremely context sensitive, thereby dashes naive notions of transferability (see, e.g. Hager 1997). For example, a solicitor might be good at establishing rapport with clients from their own class and background, but much less successful with other kinds of clients. These higher order generic attributes also constitute a significant part of workplace judgement. This clustering and integration of higher order generic attributes in judgements can be seen clearly in the Law Society assessments for the various specialties. For example, in the simulated interview in immigration law, the main assessment criteria centre on establishing rapport, communicating effectively, eliciting facts via a framework, and addressing the key issues of the case to provide sound advice. During the course of the interview the candidate makes a series of judgements that lead up to the major judgements about the nature of the case and what action needs to be taken. At each stage the assessors will assess the appropriateness or otherwise of the candidate’s judgements. But note how the criteria cluster and integrate in practice. A faulty judgement may be traceable initially to (say) a failure to elicit relevant facts. But this will likely in turn be traceable to a communication breakdown or lack of rapport. Thus good practice involves, amongst other things, skilful clustering of higher order generic attributes as appropriate to the given situation. Such clustering is a generalisation of the observation that “knowledge keeps creeping into application and vice versa”.

This skilful clustering of higher order generic attributes as appropriate to the given situation involves much more than proficiency in each of the generic attributes taken singly. There is the extra dimension of putt-
ing it all together. However, while assessors will be able to judge a performance as a whole, they will necessarily analyse and unpack the performance into the various generic attributes and the judgements involving them as they advise candidates on strengths and weaknesses. For example a candidate might be commended for establishing good rapport but still failed for giving the wrong advice. In advising candidates on establishing good rapport assessors will need specific criteria for judging such things as body language and eye contact. So while holism rules, analysis plays its part. For this reason, multiple sources of evidence enhance the reliability of the performance-based assessment decision. This principle is reflected in the Law Society of NSW Specialist Accreditation Scheme generally involving four components of assessment. Another instance of this principle is that the actor playing the client is asked to assess the candidate’s capacity to establish rapport, their communication capacity and the clarity of their advice.

The highly contextual sensitivity of workplace practical judgements poses some challenges for the Specialist Accreditation Scheme as, for example, the simulations only test the candidates in one case. While the candidate might well demonstrate the required alertness, situational appreciation, and attentiveness in the particular case represented in their simulation, it is difficult to infer from this how they would perform in very different contexts. The scheme takes account of this to some extent by making the simulation a difficult case and inferring from a satisfactory performance on the difficult case a capacity to deal adequately with easier cases. But this assumption does not adequately deal with the full range of contextual variations. This is a problem with no easy solution as the shorter components of the assessment mix tend to be relatively decontextualised. Perhaps the choice of larger assessment components for a particular candidate could be made with this problem in mind. For instance a mock file with very different contextual features from the candidate’s simulation interview.

2. **Workplace practical judgement has as much to do with identifying what problem needs to be solved as about how to solve it**

Schön (1983) and others have emphasised that professional practitioners need to be more than just problem solvers, since problems do not simply
come along in a pre-packaged way. Rather, skilful practice often involves identifying the real problem that initially may be far from apparent in the situation that is presented to the practitioner. In the case of legal practice, for example, the client will often have a mistaken idea of what the problem is that needs solving. Thus the Law Society of NSW Specialist Accreditation Scheme needs to provide plenty of scope in its assessments for the candidate to be required to identify what the problem is in situations that are not clearcut. This certainly happens to some extent in the current assessments. For example, the scripts for the actors in the simulations are set up in such a way that the ‘client’ does not establish the nature of the problem for the examinee. This is done by the script having two levels of information. The actor is instructed to provide routinely the information shown in plain case in the script, whereas the information shown in italics is to be provided by the actor only if the examinee’s questions are skilful enough to extract it.

This level of uncertainty is important since other parts of the overall assessment scheme may present relatively clearcut problems. This is true of most of the written examination questions. It seems to be true also for mock files. Whether there is sufficient assessment of candidates’ capacities to identify problems as against solving them needs to be kept in mind as the assessment scheme is further revised.

3. WORKPLACE PRACTICAL JUDGEMENT IS LEARNT BY EXPERIENCE OF PRACTICE

Since practical judgement requires experience of practice for its development, it follows that formal course by themselves are insufficient to create a competent practitioner. Though such courses may simulate practice in various ways, they typically lack important ingredients of the real thing. Referring to the Law Society of NSW Specialist Accreditation Scheme, legal academic Michael Chesterman noted: “Specialist accreditation reflects a greater recognition by legal educators and the profession that legal education doesn’t stop at graduation.”

Of course, while development of practical judgement requires experience of practice, it is also the case that not just any experience of practice will suffice. In effect the Law Society of NSW Specialist Accreditation Scheme
is selecting out those solicitors whose workplace practical judgement, learnt by experience of practice, is deemed to be of the right kind. How do they know what is the “right kind”? The performance standards for each specialisation were designed to reflect the practice of a group of solicitors who had *de facto* recognition within the profession as specialists in their respective areas.

The existence of the Specialist Accreditation Scheme is itself a promoter of enriched workplace practice as practitioners seek to refine and enhance their practice along the lines represented in the performance standards. The evaluations of the scheme have shown strong support amongst candidates, including unsuccessful ones, for the educational value of the assessment. The accreditation scheme has clearly motivated practitioners to think about practice in new ways. This is in line with the claim that performance-based assessment is itself educational in that learning and assessment are not as rigidly separated as has often been the case with some other types of assessment.

4. **WORKPLACE PRACTICAL JUDGEMENT REQUIRES CHARACTER**

According to Lipman, “....judgments, unlike skills, are minuscule versions of the persons who perform them. This is so in the sense that each and every judgment expresses the person who makes the judgment and at the same time appraises the situation or world about which the judgment is made. We are our judgments and they are us. This is why the strengthening of my judgment results in the growth and strengthening of myself as a person” (Lipman 1991:171).

Thus, in an important sense, workplace practical judgements are bound up with the kind of persons that we are. This follows, of course, from the holism discussed above. Given this, it is interesting to find that evaluations of the Specialist Accreditation Scheme found that a major quality that clients want in a specialist solicitor is “humanness”.

The evaluator expanded on this as follows: “To put it simply, what clients want is someone who understands them and treats them well. They want a solicitor who is considerate, kind, trustworthy, and who is interested in what the client has to say. The specialist is somebody who is
personable, puts the client first and is approachable. The specialist should have a genuine interest in the solving of the problem” (Armytage, Roper & Vignaendra 1995:93).

CONCLUSION

The Law Society of NSW Specialist Accreditation Scheme appears to be a very successful example of performance-based assessment. Like any assessment system it represents a tradeoff between what is desirable to maximise the validity and reliability of the system and what is practically feasible. Since the scheme essentially assesses the development of solicitors’ workplace practical judgements, some features of such judgements have been discussed as a way of highlighting the strengths and limitations of the Specialist Accreditation Scheme.

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Standards-based assessment for the historically dispossessed-moving mountains as well as coal: work in progress

ANNEMARIE RADEMEYER

INTRODUCTION

"Competency-based education" must lead to competent performance. Competent performance is judged against the requirements of a standard of performance. This chapter is premised on the following definition: Competence is the ability to perform to standard. This chapter contributes to this book about the implementation of competency based education by reflecting on the implementation of a system of judging competent performance. The chapter is about implementing standards-based assessment in the South African context.

This chapter contributes a case study to this book whose central theme is the implementation of competency based education. The chapter presents a case study of the implementation of standards-based assessment in a South African coal-mining house and falls squarely in the arena of implementation of assessing against workplace standards. This chapter is about the challenges of establishing an enabling environment for assessing against workplace standards in a hostile context. It is about implementation in a hostile environment whilst responsibly setting precedents for workplace assessment in a country in which the National Qualifications Framework (at the time of going to print) has not a single registered standard.

What is required to implement standards based assessment in any workplace internationally? In essence technically very little is actually required. At a minimum an organisation implementing assessment against workplace standards requires legitimate performance standards and an

\[ \text{In this chapter the phrase workplace assessment is used intending the meaning of assessment of competence against workplace performance standards.}\]
effectively managed assessment system. The real challenge to implementation is enabling a shift in mindset about learning and assessment. Shift in mindset is the greatest challenge to practitioners all around the world when they implement standards-based assessment. It is a mindset in which performance standards specify excellence and in which assessment is open and assesseee-driven. It is a mindset in which the notion of competence shifts to the ability to perform to the required standard of performance.

The chapter provides the reader with a case study of the national and company context in which the standards-based initiative is unfolding and reflects primarily on the mindset challenges referred to above. These challenges may be particular to the South African experience but they are also likely to be shared by practitioners around the world. This chapter, and the effort it reflects, is work in progress.

CASE STUDY BACKGROUND

A major change initiative has been underway since mid-1996 in Ingwe Coal, a coal mining organisation in South Africa. It is the standards-based assessment initiative that will result in the assessment of every employee against the performance standards attached to their role. It is the standards-based assessment initiative in Ingwe Coal which forms the basis of the case study on which this chapter is based. The term standards-based assessment (SBA) is given to a comprehensive and rigorous process of making judgements about employees’ performance. It is a form of assessment in which a person’s performance is considered against clear descriptions of the performance expected.

In September 1996 the writer negotiated a post with the Senior Human Resources manager of Ingwe Coal to implement a standards-based assessment system in the organisation. The motivation for this negotiation is a belief that standards-based assessment would establish a revolutionary way of recognising workplace competence, contribute to the National Qualifications Framework, which is in its infancy in South Africa, make a fundamental contribution to improving productivity and safety and substantially shift the relationships in the working operations away from paternalism and racism. The writer was, and remains, driven by estab-
lishing a successful implementation site of standards-based assessment in the mining industry. The assumption was, and remains, that if standards-based assessment can work in the mining industry in South Africa it can work anywhere in the world.

The case study commences with an overview of the organisation and the South African legislation that relates to the implementation of standards-based assessment in Ingwe Coal.

MINING INDUSTRY BACKGROUND

Billiton Coal is, at the time of going to print, an international coal company based primarily in South Africa and Australia, wholly owned by London based Billiton. Its South African operation (known as Ingwe Coal) employs 12 000 employees in a regional head office and ten mining operations.

Billiton Coal is the world's largest steam coal exporter and the fifth largest coal producer. Ingwe is South Africa's largest coal producer, producing approximately 30% of South Africa's coal output. Ingwe operates ten mines in South Africa, comprising both open cast and underground mines. Approximately 60% of Ingwe's production is based on open-cast mining methods, which primarily involves the use of draglines, but also truck and shovel mining methods.

To come to grips with the complexities of the actual implementation of standards-based assessment in the organisation the reader must take into account a number of influencing areas.

These include

- A socio-political perspective on the mining industry in South Africa in terms of the power relations between employees of the industry and the particularities of trade unionism within the industry;
- A sociological analysis of the effect of male domination of the industry;
- A socio-psycho analysis of the health and safety record of the industry;
- An economic analysis of the history and future of the mining industry in South Africa;
• An historical analysis of apartheid education in terms of its effect on skills shortages in the mining industry, illiteracy and innumeracy amongst the majority of employees in the industry as well as learner attitude to education and training;

• A management and business perspective on change, change management, and innovation.

The reader needs to contextualise their reading of this case study, which reflects on the implementation of standards-based assessment in Ingwe, by keeping in mind that the mining industry in South Africa is characterised by:

• High levels of mistrust amongst employees;
• Predominantly patriarchal, militaristic styles of management;
• Poor health and safety records and high HIV infection rates;
• High levels of retrenchments and mine closure;
• High levels of illiteracy and even higher levels of innumeracy;
• High resistance to change amongst predominantly white middle management.

Conforming to new legislation the standards-based assessment process is a process that intends to encourage Ingwe employees to accept individual responsibility for performance and safety, opening up access to learning and assessment and encouraging the deployment of new skills, knowledge and attitudes in the workplace.

LEGISLATIVE BACKGROUND

The decision to implement standards-based assessment originated in the imperative to be a world class coal producer in a setting in which many mines have gone into terminal decline. Although the decision to implement standards-based assessment primarily lies with a business imperative, there is an organisational decision to promote the National Qualifications Framework (NQF) set up by the South African Qualifications Authority Act of 1995. A further driver to Ingwe's implementation of the formal recognition and assessment system is the Mine Health and Safety Act (Act 29 of
1997). These two pieces of legislation are briefly reviewed in the sections that follow.

**The Mine Health and Safety Act**

The Mine Health and Safety Act (MHSA) requires the employer to staff the mine with due regard to health and safety:

(7)(1) To the extent that it is reasonably practicable every employer must
(d) consider an employee’s training and capabilities in respect of health and safety before assigning a task to that employee.

As standards-based assessment has unfolded the requirement quoted above has become the primary driver for the standards-based assessment initiative. For management it is legally binding to be able to prove competence of employees in terms of the MHSA. Standards-based assessment provides a tool for the individual, their supervisor and therefore the employer, through Ingwe registered assessors, to assess and verify workplace ‘capabilities’. Ingwe has adopted the standards-based assessment system, which simultaneously to integrating the principles of the NQF into its operations, provides the mechanism by which Ingwe is able to prove that the employer staffs the mine with due regard to health and safety.

Since liberation was achieved in South Africa in 1994, several other relevant pieces of legislation dealing with education and training have been developed and promulgated. Those impacting directly on organisations are:

- The South African Qualifications Authority Act (Act No. 58 of 1995)
- The Skills Development Act (Act No. 97 of 1998)
- The Employment Equity Act (Act No. 55 of 1998)

The central premise of these Acts is that the general level of skills in South Africa must be upgraded in order for people to access opportunities, and for the country to prosper. Conscious provision must be made for access to education and training opportunities, with the main objective being to enable advancement in the workplace. Organisations are
therefore called upon to align themselves with the national systems and structures that emerge as a result of the above legislation. The specific immediate requirements for organisations in respect of these Acts are:

- To identify their competency requirements
- To develop the concomitant unit standards and qualifications
- Where appropriate, to package these unit standards and qualifications into learnerships (formal, structured learning programmes with practical and theoretical components, and an agreement between the learner, employer and provider)
- To align their training provision with all of the above
- To develop an organisation Skills Plan to feed into their Sector's Skills Plan
- To position themselves for accreditation as providers of education and training and/or assessment.

**THE SOUTH AFRICAN QUALIFICATIONS AUTHORITY ACT**

The South African Qualifications Authority (SAQA) was established to implement the National Qualifications Framework (NQF). The fundamental objectives of the NQF are to:

- integrate education and training
- provide for the recognition of individuals' prior learning
- facilitate greater portability of qualifications from one work-place to another
- enable greater, more equitable access to education and training opportunities.

The South African system resembles (although there are differences) the outcomes-based education, training and assessment systems which operate in the United Kingdom, Australia and New Zealand.

SAQA has responsibility for the registration of unit standards and qualifications on the NQF, and quality assurance in respect of the training towards and assessment against these unit standards and qualifications. Provision is made in the SAQA Act for the establishment of National Standards Bodies (NSBs’), Standards Generating Bodies (SGBs) and Education and
Training Quality Assurers (ETQA's) – bodies at economic, educational or professional sector level - to whom SAQA will respectively devolve the functions of standards and qualifications setting, and quality assurance.

**STANDARDS-BASED ASSESSMENT: THE PERFORMANCE STANDARDS**

At the end of 1999, more than 1000 performance standards were available in the Ingwe database. The process of writing the performance standards commenced in July 1996 and by January 1998, there were sufficient performance standards available for mines to start using them and hence piloting of standards-based assessment commenced. At the same time, Ingwe was in a position to feed its standards into national standards generating processes. The case study at this point goes in two directions. One path, leads the reader to review the processes through which Ingwe ensures that performance standards on the NQF related to its business needs are fit for purpose. The second path leads the reader to review the use of Ingwe performance standards to assess individual competence in the organisation.

**DERIVING DRAFT UNIT STANDARDS**

A statement of the obvious introduces this section. In order to assess employees against workplace standards, Ingwe needs performance standards. Draft performance standards covering Mining (coal extraction in underground and opencast sites), Engineering (support services to coal extraction machinery) and Processing (transforming extracted coal into saleable coal) have been written in accordance with the SAQA format (SAQA decision 0208/96). It is anticipated that Ingwe's draft performance standards will ultimately reflect in Mining Qualifications Authority submissions to National Standards Body 06: Manufacturing, Engineering and Technology.²

² 12 National Standards Bodies are established. Their role is to propose unit standards and qualifications to SAQA for registration on the NQF.
The philosophy that frames the performance standards generation process in Ingwe includes the following:

- Employees want recognition for their achievements and perform better when what they are required to do is clearly articulated.
- A decision by a recognised assessor that an individual is competent (defined as the ability to perform to standard) is necessary to confirm that individuals are working to the legislated standards of production and safety.
- Performance standards set common quality indicators that benchmark decisions about the expected performance of people, systems and structures and are therefore clearly articulated endpoints of learning.
- Training inputs will align to ensure employees meet the benchmark requirements.
- Performance standards are explicitly developed against the need for constant improvements in production and safety performance and the innovation this requires.

The performance standards for the Mining discipline were derived as follows. The functional analysis on which the draft performance standards for the Mining discipline were based was conducted in the period prior to July 1996 by joint teams of management and unions as part of a broader process in the company. The information contained in the performance standards was obtained from all the Ingwe mines. Management 'training and development committees' on the basis of their expertise in the mining field selected the standards-writers. A framework development officer of the New Zealand Qualifications Authority (NZQA) trained the Ingwe standards-writers. The draft performance standards that resulted were circulated to all the mines for consultation with the relevant role holders. Following this broad consultation process the performance standards were redrafted, critiqued by the NZQA and re-presented to the original union/management teams which had conducted the functional analyses. Once the proposed changes to the performance standards had been completed assessment documents were drafted as a final and very demanding quality check on the usability of the standards. A limited selection of the perfor-
mance standards were then piloted at one of the mines after which they were tabled with the “Mining Training and Development” committee for approval for in-house use and as input into industry level deliberations. These performance standards with their associated assessment documents are in the Ingwe database and can be downloaded to Ingwe mines for use.

The standards have been written in the form of meaningful clusters of performance outcomes that are recognised as having high value in the world of coal mining. They represent complete statements of the competence required, including any requirements relating to health and safety, organising work, solving problems and dealing with people and they signify a rounded achievement that Ingwe believes is worthy of public accreditation.

In the section which directly follows, Ingwe’s interaction with the statutory body, the Mining Qualification Authority, is described. The use of the performance standards in the workplace is picked up in the later section entitled ‘SBA: the assessment in the workplace’.

THE MINING QUALIFICATIONS AUTHORITY

The Mine Health and Safety Act makes provision for the establishment of a Mining Qualifications Authority to enhance the quality of education and training in the mining industry and thereby improve health and safety standards. The main functions of the MQA, which was officially launched on 30 June 1997, are those required of SGBs and ETQA’s under the SAQA Act. The MQA will also take responsibility for addressing the requirements of the Skills Development Act in the mining sector; it has been recognised as the Sector Education and Training Authority (SETA) for the mining sector. In essence, the MQA has the following key deliverables in the mining industry:

- The development of mining industry unit standards and qualifications for registration on the NQF
- The establishment of a quality assurance system
- The promotion of optimal utilisation of the unit standards and qualifications
- The development of a mining sector skills plan
• The development of learnerships
• The collection of levies from employers
• The allocation of training grants to employers
• The provision of performance reports to the government.

THE MQA STANDARDS GENERATING INITIATIVE

The MQA began the actual task of generating or writing unit standards in March 1999, following several months of preparatory work. In March 1998 a workshop was held between the MQA and all Professional Associations that are active in the mining industry, including Statutory Bodies. The objective was to find a way of collaborating on the question of standards generation and qualifications design, and to this end, a “Memorandum of Understanding” was signed indicating the intention of the parties to establish mechanisms for collaboration. Further discussion between the parties has resulted in the following developments:

• identification of “domains” (or areas) within which standards will be generated;
• establishment of Standards Generating Groups (SGGs) for each of these domains;
• establishment of Standards and Qualifications Co-ordinating Groups (SQCGs), constituted of representatives of the MQA and the Professional Associations to oversee and co-ordinate the work of the SGGs;
• nomination and training of standards writers from the MQA (State, labour and employers) and the Professional Associations for each of the Standards Generating Groups. The New Zealand High Commission financed the participation, as a resource person, of the head of Framework Development from the New Zealand Qualifications Authority.

With the registration in early 2000 by SAQA of the “Minerals and Mining Standards Generating Body” the mining industry is well poised to ensure that the standards required by it are developed and registered on the South African NQF. In addition the MQA standards generating initia-
tive provides a lead model in South Africa for the generation of standards within an industry.

**TURNING INGWE PERFORMANCE STANDARDS INTO NQF UNIT STANDARDS**

Ingwe’s strategy with regard to standards generation has been complex in its simplicity. Ingwe has its database of performance standards that are attached to the roles of every Ingwe employee. For coal mining, engineering and processing the standards are internally generated as per the processes previously described. Performance standards applicable to senior management and executive roles are primarily drawn from international frameworks and their applicability confirmed for internal use. It is anticipated that the Ingwe framework will be made up of mostly nationally registered unit standards, Ingwe performance standards\(^3\) and a small number of mine specific performance standards\(^4\). The return on investment for Ingwe’s standard generating Rands will be reaped in two ways.

- **The national recognition of the competence of its employees who, as individuals, will be able to use the credits achieved towards newly established mining qualifications.**
- **The confirmation of competence of employees against the standards attached to their current roles. In this way Ingwe exceeds the requirements of the Mine Health and Safety Act.**

Whilst the internal imperatives for standards-based assessment are Ingwe’s primary motivation for generating standards, Ingwe has co-operated with standards generating activities within the employer lobby and within the Mining and Minerals SGB. As SAQA moves to focus on implementing the NQF, Ingwe Coal preparations are enabling it to play a very active role within the MQA, in deriving coal-mining performance standards for registration on the NQF as well as providing responsible and effective precedents for implementation of workplace assessment.

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\(^3\) There may be a small number of Ingwe standards which are not registered nationally but still required by Ingwe in order to benchmark employee performance.

\(^4\) There are instances of specific types of machinery that are only used at one mine.
STANDARDS-BASED ASSESSMENT: THE ASSESSMENT IN THE WORKPLACE

Ingwe “imported” NZQA expertise in framework implementation to assist in the development of the policies, procedures and methodology for implementing SBA at Ingwe’s nominated pilot site. The workplace assessment model illustrated in the figure below and elaborated in the paragraphs that follow, review a three stage training and assessment process which assesses the competence (the ability to perform to standard) of Ingwe employees in their “current work roles”.

WORKPLACE ASSESSMENT MODEL

1. Employees get the performance standards relevant to their workplace roles from a Human Resource Development staff member.
2. Prior to being assessed by an Ingwe registered assessor, employees assess their own skill levels against the draft standards associated with their roles in the company. This is done with the help of an assessment facilitator. The assessment facilitator’s role is to act as a sounding board and to assist the assessee to prepare for
formal assessment. The assessment facilitator is usually a first-line manager who is familiar with the person’s roles and responsibilities.

3. When the person decides they are ready for formal assessment, they apply for assessment. Assessment is then scheduled and carried out as a natural part of a person’s working day. For the majority of production personnel, assessment appropriate to what is being assessed usually involves a mix of questions and direct observation of the person on the relevant working areas. The outcomes of the assessment is stated as ‘competent’ or ‘not yet’ competent against the standards with reasons stated if the assessment is ‘not yet’. If they are judged not yet competent they undertake further training. This training is usually slotted into the production process so there are no disruptions to production.

Employees and their representatives have endorsed the implementation of standards-based assessment in the organisation because the advantages to the individual employee in participating in standards-based assessment is the possibility (assuming the South African NQF actually materialises) of formal, national and international recognition of their competence.

Employees of Ingwe who have had the opportunity to be assessed have embraced standards-based assessment because it offers them access to transparent assessment (performance) requirements. Due to performance standards being explicit about the skills, knowledge and attitudes required of employees in order to receive formal recognition of their competence, assessment is transformed from something that is done to the learner into something which learners can plan to participate in when they are ready. This form of assessment recognises that adults decide what they need or want to learn by assessing their current performance against desired performance and identifying either gaps in their performance or new skills they wish to acquire.

**TRAINING AND ASSESSMENT OF ASSESSORS**

Assessors are selected and recruited at each mine in accordance with the policies and procedures established for standards-based assessment by
the SBA team at a mine. HRD staff at the mine train the potential assessors. Their training is based on a generic training programme which is customised to the mine specific SBA policies and procedures. The assessor training is premised on the assumption that assessment facilitators will facilitate assessment to standard\(^5\). Ingwe has not bought in any assessor training thus saving significant amounts of training Rands, building internal capacity to train assessors and ensuring assessor training is focused on individual and company needs. HRD staff members act as assessment facilitators for trainee assessors. Individuals who are able to meet the standard without going through a training process are also able to apply for assessment. The difficulties related to establishing a corps of workplace assessors is dealt with in the section of this paper dealing with assessment challenges.

**Turning Ingwe registered assessors into MQA registered assessors**

Ingwe has set up quality assurance mechanisms at Head Office and mine level. Policies and procedures apply to the selection, recruitment, training, assessment and registration of workplace assessors at head office and mine level. At mine level, policies and procedures apply to all other quality assurance mechanisms including moderation and the maintenance of a Record of Learning. Policies and procedures are formalised and where applicable have been integrated into ISO 9000-type policies and procedures. It has been assumed, given the universality of quality assurance mechanisms in education, training and assessment, that ultimate alignment with SAQA's requirements will flow relatively smoothly. Ingwe operations will apply for accreditation as providers of training and assessment for the range of coal mining performance standards. They will also apply for registration of assessors immediately the MQA as ETQA for mining can cope with the application and unit standards applicable to assessment are generated and registered by SAQA on the NQF.

\(^{5}\) Prepare candidates for assessment (based on NZQA unit standard 11281).
MINDSET SHIFTS AND ORGANISATIONAL CHALLENGES

The following section of the chapter turns to analysing the implementation challenges that have faced and continue to face Ingwe Coal as it implements the holistic system of standards-based assessment outlined in the preceding sections of the paper. The sections which follow will be fleshed out by the writer in months to come through further research and writing in order to contribute to those South African organisations which have yet to commence establishing systems through which they can assess against workplace standards.

MINDSET SHIFTS

The writer makes a simple assertion. In order to successfully implement standards-based assessment a shift in mindset is required. In order to create the required shift, employees must internalise an attitude toward their work: perform to standard or close the gap in your performance until you are able to perform to standard.

For the employees of Ingwe Coal, across levels of the organisation, from the machine operator at the coal face to the Chief Executive Officer, across the disciplines from Mining to Engineering to Human Resources, from management to unions, all have had to learn a new language and a new attitude. Ingwe Coal employees have had to wrap their heads round new ways of talking about competence, about assessment, about training inputs, about performance management. What follows is an overview of some of the shifts in language and understanding that are taking place in Ingwe whilst implementing standards-based assessment.

FROM "INPUT" TO "OUTPUT"

The shift in understanding, which the writer has characterised as input to output, is exceptionally difficult for people to grasp. The shift is required at the level of generating unit standards as well as describing forms of evidence in the assessment process. For employees to understand the
term "outcome" to carry the meaning of a result of work activity rather than the activities or tasks that lead to the result is an ongoing challenge. For employees to understand that results of assessment activities collected during a training phase provide evidence of competence but may be insufficient as evidence of current competence, can be very threatening. The complexities of the shift are not explored in more detail in this paper. Further research as to why the shift is so difficult for people to grasp is required so as to enable articulating the shift in ways that help people to make the shift.

**FROM “FAIL” TO “NOT YET COMPETENT”**

The challenge of viewing learning as a process that enables a person to meet a standard of performance is not unique to South Africa. The assessment world internationally inherited the language of ‘pass’ and ‘fail’. This legacy resulted in an iron wall between learning and assessment. South Africa’s history, however, meant that often the distinction between those who pass and those who fail was largely racial. Fears about what standards-based assessment means to different employees can in part be explained by this heritage. For some white employees there has been the fear of “failing” in the new system and therefore having the “pass” of the past made illegitimate. For some black employees there has been the fear that the standards-based assessment system is another management trick to “fail” employees and keep them from development opportunities. The power of the standards-based assessment system as it has been introduced into Ingwe is that for all employees their dignity is affirmed when they can embrace the notion of being “not yet competent”. The employee plans to close the gaps in their performance against the standards attached to their current roles. A shortfall in performance will no longer carry all the personal and social stigma of failure. In training of its assessees, assessment facilitators and assessors, the following message to employees is repeatedly communicated: “I am not yet competent against standard X,” means, “I do not yet meet the required standard of performance required by unit standard X”. I have not failed. I am not a failure. I am not incompetent.
FROM "TEST" TO "ASSESSMENT"

In helping employees learn to use the phrase "I am not yet competent" or "S/He is not yet competent", Ingwe employees have had to (and continue to) internalise that learning and assessment are integrated. They continue to have to take on board that assessment is no longer a once off event (a test) after which one gets a large red tick or from which one leaves wearing a public 'dunce' hat. The submission of different forms of direct, indirect and historical evidence for consideration by the assessor is a radical shift from the "test/exam". This shift in language from once-off-test to integrated assessment is not particular to South Africa. However in the South African context this shift in language and in understanding continues to be a major challenge for those implementing standards-based assessment in Ingwe.

ORGANISATIONAL CHALLENGES

The previous sections have dealt with how implementing a standards-based assessment system constitutes a shift in the way management, the unions and employees think about learning and assessment.

The executive levels of Ingwe Coal have committed themselves to the implementation of standards-based assessment because they have accepted the following logic:

- Improved company performance results from access to economically viable coal reserves AND improved systems AND improved human performance
- Standards-based assessment specifically targets human performance and will result in improved individual employee performance as each employee moves to close any gaps in their individual performance
- The systems that the company requires employees to perform within will need to be articulated clearly and made accessible to employees to enable confirmation of competence.
- Standards-based assessment will create synergies across departments and disciplines, across organisational requirements rang-
ing from performance management to training needs analyses, using a common tool from the people at the face to the people charged with ensuring the ongoing viability of the organisation.

ASSESSMENT CHALLENGES

There are numerous challenges that face the actual assessment process beyond those already described. These include:

- overcoming of anxiety amongst production managers that the new system will jeopardise production;
- shifting responsibility for HRD and assessment to line;
- entrenching assessment as assesseee-driven;
- establishing assessment systems to manage ongoing confirmation of competence;
- training enough assessors to adequately cover the large number of assessments required;
- ensuring that assessment facilitators perform the required role;
- establishing the credibility of assessors;
- rewriting of all Mine Standards and Procedures at each mine which support the standards-based approach to assessment. 6

A specific assessment challenge facing assessment in the South African mining industry is the challenge of illiteracy. This aspect provides a plethora of research opportunities afforded by standards-based assessment in Ingwe.

CONCLUDING COMMENTS

This case study has taken the reader through the enabling legislative frameworks that have added impetus to the implementation of standards-based assessment in Ingwe Coal. The chapter has described the internal

6 For example an assessment criteria may read: Pre-use inspection is conducted in accordance with mine specific requirements. The mine specific requirements need to be clearly articulated and readily available to assesses, assessment facilitators and assessors.
processes required to implement standards-based assessment as well as the ongoing paradigm shifts and organisational challenges which continue to face Ingwe as it moves to assess all its employees against workplace standards.

This has been a chapter about a revolution: an organisational revolution taking place within a broader international revolution in performance, HRD and assessment systems. For Ingwe, standards-based assessment is a coal face revolution. A revolution aimed at saving lives, empowering employees, setting national precedents and improving individual and company performance.

Within the stark contradictions of South African society and the multiplicity of problems facing the country, protagonists of an NQF with its related quality assurance mechanisms are compelled to remain doggedly focused on what they aim to achieve. Protagonists of workplace assessment systems aligned to an NQF require new forums and new spaces to debate and build the discipline. The discipline needs to move out of the education field, out of the HRD field and into a new field where the challenges and complexities are elaborated in order to harness the growth opportunities of assessing against workplace standards.

The case study has provided an example of the implementation of a standards approach to workplace assessment in the South African context. Readers of this book are exposed to a broad range of international case studies. The writer invites readers to reflect on the following questions:

- What are the possibilities for a qualification free recognition framework?
- What comes after standards-based assessment?
- Why national qualifications – why not individualised qualifications with broad rules of combination?
- Can we generate common explanations of successful workplace assessment across contexts?
- Is an international framework desirable for workplaces?
- How does a National Qualifications Framework enable and constrain workplace assessment that is assessee-focussed?
- What values drive standards-based assessment in workplaces across international contexts?
Assessing against competency standards in the workplace – a New Zealand perspective

LIZ BOWEN-CLEWLEY

BACKGROUND

In 1990 New Zealand Qualifications Authority presented a blueprint for a National Qualifications Framework (NQF), a structure intended to cater for New Zealand’s qualifications needs into the 21st century.

That blueprint reflected requirements set by government and views and recommendations expressed in a series of papers, reviews and reports over several decades. It consolidated views that were emerging on changing purposes for assessment, changing types of qualifications needed in local and international economies, international trends in assessment and certification and positive and negative aspects of current practices.

In 1993 the first unit standards were registered on the National Qualifications Framework and assessment and moderation practices were developed by providers and workplaces to meet the requirements of assessing against competency standards. Various approaches were used and in the emerging practice issues identified were workload effects, definition and application of standards, suitability for all areas of learning, effects on learning and learner, inference of capability from assessment and comparability of judgements. A significant divide between workplace and provider based assessment was also apparent as attempts were made to implement traditional approaches to assessment in a competency based regime.

In 1998, Chris Devereux from the United Kingdom and Liz Bowen-Clewley of New Zealand were both working in the field of assessing workplace learning against competency standards and met to discuss their conceptual frameworks and methodologies.

1 In New Zealand the term used is standards based assessment but it is synonymous with the international move to competency based assessment.
Independently they had reached similar conclusions that are summarised below.

- The collection of evidence/formative assessment model is the only feasible model for assessment in the workplace.
- The focus of assessment should be on the learner rather than the assessor and on whole task performance judged against holistic assessment criteria/judgement statements which generate reflective thought on personal practice.
- Validity and sufficiency are the two key determinants in workplace assessment and must be fully understood by workplace assessors and moderators.
- Assessing against variance from, rather than adherence to standards is acceptable practice in workplaces with high levels of quality controls.
- Actual performance is the only determinant of competence.
- Learners can be trusted to make sound judgements about their own performance when the criteria are clear.
- The notion of professional judgement has been made redundant in the face of slavish adherence to the words on paper and "learned interpretations". Professional judgement, supported by learner feedback can be trusted and should be an integral part of the assessment process.

This paper tracks the New Zealand side of the development of the methodologies that are part of the current practice of the author and her associates. It also draws on a review undertaken for the New Zealand Qualifications Authority by the author and Jim Strachan in 1997.

**THE CATELYST TO CHANGE**

In making research and development a primary focus of their operations in order to provide clients with the latest research on best practice in

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implementation and practical solutions that have been industry tested, Competency International (CIL) started to develop some alternative approaches to workplace assessment. This was largely motivated by an initial workload that was focused on remediating workplace assessment systems that were unmanageable, irrespective of high levels of commitment to implementing and maintaining them. CIL decided to return to placing a focus on the work being done as generating naturally occurring evidence of competence rather than on the specific design of assessment tasks that required the trainee to “perform” in set pieces for assessment purposes.

Thus was born the farm gate model, which uses the example of normal work activities as generating evidence against a number of unit standards. In this model the focus moves away from designing and making judgement of the performance of specific assessment tasks (assessor centred) to the candidate collecting, recording and having verified evidence of competence (learner centred).

**THE FARM GATE MODEL**

**INTEGRATING WORK AND ASSESSMENT USING NATURALLY OCCURRING EVIDENCE**

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>STANDARDS FOR WHICH ACTIVITY IS PRODUCING EVIDENCE</th>
</tr>
</thead>
</table>
| Make a farm gate and fit on site | 2430 Draw and interpret engineering sketches under supervision  
• Sketch drawing and have it checked by the boss  
• Interpret drawing  
• Select steel  
• Cut to lengths |
| 2430 (As above) |
| 4798 Identify and select engineering materials for specified applications  
• Cut to lengths |
| 2418 Lay out and mark off irregular fabrication shapes under supervision  
• Weld |
| 2425 Mechanically cut sheet, plate, tube, pipe and structural sections  
• Weld |
| 2682 Weld steel up to 10mm thick with the manual metal arc welding process in the downhand position  
• Assemble  
• Fit on site |
| 2424 Assemble and mechanically join sheet, plate, tube, pipe and structural sections  
• Assemble  
• Fit on site |
| 2424 (As above) |

3 The currency of competence in New Zealand
This approach is being translated into a new approach to the writing of evidence guides and the actual collection of evidence by apprentices in the Light Fabrication area of the Engineering Industry in New Zealand. This is to be trialled in 2000 and, if successful, is likely to be adopted by other sectors serviced by the Industry Training Organisation. The first stage of training for an apprentice is as follows:

JOB/UNIT STANDARD MATCHING TABLE

<table>
<thead>
<tr>
<th>STAGE ONE</th>
<th>WORK SAFELY IN ALL AREAS</th>
<th>USE AND CARE FOR A RANGE OF WORKSHOP EQUIPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHEN YOU HAVE COMPLETED THE FOLLOWING JOBS (BEEN SIGNED OFF BY YOUR SUPERVISOR):</td>
<td>WHEN YOU HAVE COMPLETED THE FOLLOWING JOBS (BEEN SIGNED OFF BY YOUR SUPERVISOR):</td>
<td></td>
</tr>
<tr>
<td>JOB 1.1</td>
<td>WORK SAFELY IN ALL AREAS</td>
<td>USE AND CARE FOR BASIC HAND TOOLS</td>
</tr>
<tr>
<td></td>
<td>2670, 2824, 15848</td>
<td>2395, 2396 12299</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2387, 2395, 2396, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2672, 2676, 2678, 2679, 2682, 2680, 2683, 12299, 4796</td>
<td>2387, 2414, 2415, 2416, 2417, 2418, 2420, 2432, 2670, 2672, 2676, 2678, 2679, 2682, 2680, 2683, 2824, 4795, 4796, 15848</td>
</tr>
</tbody>
</table>

4 Reproduced with permission from COMPETENZ. This draft material is currently out for consultation and trial and may be subject to alteration.
**Identify and use different metals and materials**

<table>
<thead>
<tr>
<th>WHEN YOU HAVE COMPLETED THE FOLLOWING JOBS (BEEN SIGNED OFF BY YOUR SUPERVISOR):</th>
<th>YOU WILL BE READY TO BE ASSESSED FOR THE FOLLOWING UNIT STANDARDS:</th>
<th>YOU WILL HAVE COLLECTED EVIDENCE TOWARDS THESE STANDARDS:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Job 1.6</strong> Join Metals</td>
<td>2416 4795, 4796</td>
<td>12299, 2387, 2395, 2396, 2414, 2415, 2417, 2418, 2419, 2420, 2432, 2672, 2676, 2678, 2679, 2682, 2680, 2683, 2824, 9184, 15848</td>
</tr>
</tbody>
</table>

**Job 1.7** Identify and use different materials

**Job 1.8** Grind and polish

**Job 1.9** Set up welding equipment and weld, solder or braze under supervision

**Produce end product from drawing or sketch under supervision**

<table>
<thead>
<tr>
<th>WHEN YOU HAVE COMPLETED THE FOLLOWING JOBS (BEEN SIGNED OFF BY YOUR SUPERVISOR):</th>
<th>YOU WILL BE READY TO BE ASSESSED FOR THE FOLLOWING UNIT STANDARDS:</th>
<th>YOU WILL HAVE COLLECTED EVIDENCE TOWARDS THESE STANDARDS:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Job 1.10</strong> Use a simple sketch/drawing to produce end product</td>
<td>2430, 2431, 2432, 2414 4432, 4433, 4436, 8492, 8489</td>
<td>2387, 2395, 2396, 2415, 2416, 2417, 2418, 2419, 2420, 2672, 2676, 2678, 2679, 2682, 2680, 2683, 2824, 4796</td>
</tr>
</tbody>
</table>

**Job 1.11** Use measuring tools

**Job 1.12** Practice quality management under supervision

**Job 1.13** Do basic calculations

**Job 1.14** Do basic marking out and simple patterns
These tasks are supported by guides which outline the activities and their related standard required of the apprentices. These are designed as one document that assist workplace trainers and their apprentices. They are also the evidence guides for the assessors.

**ASSESSMENT**

The model above is the result of considerable research into assessment and moderation and, more importantly, practical observations in the workplace. The selection of the theoretical framework that underpins the model is discussed below.

*The nature of competence and benchmarking of entry levels*

Implicit in any discussion of the acquisition of skills and their application is the notion of competence and how it can be assessed. This is of particular concern where safety of both structures and people can be compromised by incompetent performance.

There is considerable debate over how to define competence in general terms. Gonczi defines it as *the collection of attributes needed for intelligent performance in specific situations*, while Beaumont (1996) suggests it is *the ability to apply knowledge, understanding and skills and performing to the standards required in employment. This includes problem solving and meeting changing demands*.

However, most agree with Worsnop (1993) who suggests that the concept of competence should encompass four elements:

- The requirement to perform individual tasks (repeatedly to a set standard)
- The requirement to manage a number of different tasks within a job

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5 Quoted by Gonczi's colleague Flowers at a seminar in New Zealand
6 Beaumont, G. (1995), Review of 100 NVQs and SVQs
7 Worsnop, P, Competency Based Training: How to do it - for Trainers, 1993
• The requirement to respond to irregularities and breakdowns in routine
• The requirement to deal with the responsibilities and expectations of the work environment, including working with others

Capper (1996)\(^8\) suggests that another element should be added:

• The requirement to handle continuous learning in a constantly changing work environment

Given those elements, there is an emerging view that competence can only be demonstrated by performance in a specific context. Assessing parts of a role in isolation from one another may give some evidence towards that judgement, but the most satisfactory evidence of competence comes from on-going actual performance. Moreover, whilst performance may demonstrate knowledge and understanding, evidence of knowledge per se most often does not demonstrate understanding and application.

This is supported by some of the leading experts in competence based assessment. Raggatt and Hevey (1994)\(^9\) refer to such factors as – whole evidence package decision making; … evidence gathered for consistency over time; use of events which provide evidence across a number of elements; fostering professional judgement and a shared understanding of what is a quality standard; recording instruments that focus on what students can do and the swift identification of competence gaps.

Wolf (1995)\(^10\), Beaumont (1996)\(^11\), and Eraut and Cole (1993)\(^12\) indicate that competence style assessments have a demonstrable validity in measuring occupational performance that academic and psychological tests lack. Wolf reviews the literature on academic measures and occupational performance and shows low correlations in research reviews between

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\(^11\) ibid.

academic performance and occupational performance: The evidence on the link between academic measures and vocational performance is almost consistently damming. Wolf also suggests that assessment should be as close as possible to the outcomes one is interested in. This is a message repeated again and again in the authentic assessment and performance assessment literature.

Moreover, this is growing agreement that qualification does not equal competence as demonstrated in Table 1 below. Many groups recognise this by requiring a registration process for membership of their associa-

<table>
<thead>
<tr>
<th>LEARNING STAGE</th>
<th>IN TRAINING</th>
<th>CAPABLE(^\text{14})</th>
<th>COMPETENT</th>
<th>EXPERT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LEARNS AND PRACTISES NEW SKILLS</td>
<td>PERFORMS SPECIFIC TASKS WITHIN A SIMULATED OR PROVIDER BASED ENVIRONMENT</td>
<td>PERFORMS A RANGE OF TASKS TO A SPECIFIED STANDARD CONSISTENTLY AND MEETS OTHER COMPETENCE REQUIREMENTS IN A PERFORMANCE ENVIRONMENT</td>
<td>DEVELOPS NEW METHODOLOGIES AND ROUTINELY ADVISES/ TRAINS/ SUPERVISES OTHERS</td>
</tr>
</tbody>
</table>

| COGNITIVE SKILL | INSUFFICIENT EXPERIENCE TO IDENTIFY PATTERNS OR OCCURRENCES | UNDERSTANDS PATTERNS AND WHAT SITUATIONS ARE LIKELY TO OCCUR | IDENTIFY PATTERNS OF RECURRING EVENTS AND APPLIES CORRECTLY IN MOST SITUATIONS | IDENTIFIES WHEN EXISTING KNOWLEDGE IS INADEQUATE FOR CURRENT SITUATION/S AND DEVELOPS NEW PATTERNS AND TESTS HYPOTHESES |

| SAMPLE CREDENTIAL | NONE | 1\(^{ST}\) QUALIFICATION | PROFESSIONAL INSTITUTE MEMBERSHIP | PROFESSIONAL INSTITUTE FELLOWSHIP |

\(^{13}\) This model has been designed based on the material gathered from theorists in both assessment and cognition. It draws heavily on the work by Berryman in the area of cognitive theory and from the learning theories of Vygosky and Senge.

\(^{14}\) The term is based on research and practice used within the Canadian Rescue Services that validates the view that simulated and provider based performance is an unreliable indicator of actual workplace performance where the variables change from situation to situation.
tions/institutes, which can only be gained by demonstration of competence. The "Master Builder" and professional membership status requirements are examples of this. The mechanisms by which this is assessed vary, but almost all the groups require evidence of on-going, satisfactory performance as a component of the evidence of competence.

**ASSESSMENT MODELS**

Currently there are three major models of standards/competence based assessment operating in the professions and industry in New Zealand. These are:

**BEHAVIOURIST MODEL**

The behaviourist model requires an assessor to "see" evidence of each component of a standard or set of performance criteria. It usually requires separate assessment activities for each criterion, does not allow inference and is often based around checklists which detail all the components of the criteria.

Assessors express considerable concern about the workload and fragmentation imposed by this model and it is a difficult, if not impossible model to use in the workplace. Black (1994) described it as "the well known trap of death by drowning in detail". Indeed, the research done by Capper (1994) suggests that the attempted use of this model has been a direct cause of the lack of acceptance of standards based assessment in industry and the professions. However, many still perceive it as the model required by the use of the NQF standards and by the NZQA moderation approach.

**INTEGRATED ASSESSMENT MODEL**

Integrated assessment operates around the premise of identifying underpinning knowledge, skills and attributes across a range of standards and inferring competence in these from performance in context. The perfor-

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mance may be simulated or real. Where simulation is used, there is a requirement to design assessment activities. In New Zealand, moderation\(^\text{16}\) processes require that where this model is used, the links between the underpinning knowledge, skills and attributes and the standard/s are clearly shown in order to demonstrate validity and coverage.

Many assessors in New Zealand have heard of the work by Gonczi and Hager and are attracted to their holistic approach, which they see as important in judging competence.

**COLLECTION OF EVIDENCE MODEL**

Whilst not dissimilar from the integrated assessment model, this model focuses on the assessor, assessment facilitator/verifier\(^\text{17}\) (where one is used) and the candidate preparing an assessment plan which identifies the standards to be assessed. It identifies opportunities for collecting appropriate evidence from a range of sources but with emphasis on actual workplace activities.

The evidence is then collected by the candidate, recorded and authenticated by an authorised person, who may be a registered assessor, supervisor, verifier or an assessment facilitator. The evidence is submitted to a registered assessor, who may require further evidence before awarding credit. Once the candidate and the assessor are confident that the standard/s have been met, the appropriate documentation is completed.

It is usual for an evidence/assessment guide to support this approach by providing clear judgement requirements.

**BEST PRACTICE IN ASSESSMENT**

Recent research into best practice in workplace assessment\(^\text{18}\) indicates that assessment of competence should:

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\(^\text{16}\) Moderation is a term which represents the concept of ensuring consistency of assessors' judgement in relation to a set standard. It is known as external verification in the UK.

\(^\text{17}\) Full definitions of these terms and descriptions of their roles may be found on http://qualifications.co.nz

• combine work, training and assessment;
• make the maximum use of performance events which produce valid evidence across a number of elements;
• make maximum use of naturally occurring and readily available evidence in the work or learning setting;
• allow for the clear presentation and cross-referencing of evidence;
• ensure that candidates take an active role in planning and collecting evidence.

Moreover, Sadler (Professor of Education at Griffiths University, Australia) believes that assessment quality depends on three integrated components that make up the notion of a benchmark or standard of competence:

• well written broadly based standards;
• trained and experienced assessors – he often describes this as *guild knowledge*;
• availability of quality exemplars.¹⁹

Wolf (1995)²⁰ comes to the same conclusion, referring to networks and exemplars as mechanisms to enhance consistency. She notes all the research evidence that we have on assessors' behaviour, and emphasises the very active role their own concepts and interpretations play ... *They operate in terms of an internalised, holistic set of concepts about how an assessment ought to show, and about how, and how far, they can take account of the context of the performance.* Wolf argues that we can reach quite high levels of standardisation with decentralised assessment systems of the type which competence demands. The key requirements are exemplars and networks of assessors – plus a good deal of realism of what can be claimed and achieved.

The notion of validity has undergone a significant rethink in recent years. Initially regarded as the extent to which a test measures what it is intended to measure, validity has been reconceptualised through the work

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¹⁹ Personal interview, November 1996
The extended concept of validity has been called consequential validity, concerned as it is with the consequences of assessment and its interpretation.

The change is reviewed by Gipps (1994)\textsuperscript{21}. In describing Messick’s concept, she notes that \textit{Validity ... relates to the evidence available to support test interpretation and potential consequences of test use}. These consequences include the “washback” on teaching and the curriculum (\textit{which} are long-established consequences of assessment, particularly high-stakes testing).\textsuperscript{22} Gipps also quotes Fredricksen and Collins who refer to a particular case of consequential validity: \textit{A systemically valid test is one that induces in the education system curricular and instructional changes that foster the development of the cognitive skills that the test is designed to measure}. Given concerns over the limited range of abilities assessed in external examinations, and the intention of the National Qualifications Framework to recognise a broader range of skills and assess against standards rather than other people, this shift in thinking about validity has had important implications for workplace assessment in New Zealand.

Moreover, the concept of validity has been extended beyond the design of assessment tasks to the design of competency standards, assessment systems and moderation procedures. The definition of validity is now often given as “fitness for purpose” and at a symposium on competency based assessment in the workplace\textsuperscript{23} at the University of Cambridge in the UK in 1999, the group went so far as to define some key requirements which reflect this. They noted, for example that standards design should be adapted to particular and changing workplace circumstances ‘fitness for purpose’, rather than being used as an all-purpose template. Oates (1999)\textsuperscript{24} explores these issues in reviewing approaches to analysing and describing competence.

\begin{footnotes}
\item Gipps C (1994) \textit{Beyond Testing? Towards a Theory of Educational Assessment} Falmer, Lewes.
\item Gipps \textit{ibid.}
\item The papers presented at this symposium with commentary on conclusions reached by participants are currently being prepared for publication as a CD ROM.
\item Oates, T., (1999) \textit{Analysing and describing competence – critical perspectives}, QCA.
\end{footnotes}
One other shift regarding validity is worth noting. While validity has always been acknowledged as more important than reliability (the second criterion of test quality), it is only recently that the acknowledgement has been acted on. In other words, comparability does not supersede validity in importance, a point to note when considering the objectives of moderation.

The related issue of sufficiency is linked to two underlying aspects: the purpose for which the result will be used, and the confidence with which the assessor makes judgements. Purpose underlies all validity judgements. Wolf\textsuperscript{25} comments that the competence movement in the United States, the UK and Australia has always paid attention to the importance of broad conceptions of what ‘competence’ involves - insisting that ‘competence is a wide concept, embracing transfer, planning, personal effectiveness and not merely narrow skills.

Focusing on the purposes of NVQ assessment, Beaumont\textsuperscript{26} (1995) says employers need to know their employees can actually do what is required of them. ... Employers' performance reviews check for total competence, irrespective of qualifications. NVQ/SVQ assessment is carried out over an extended period. It includes repeated demonstrations. Candidates must demonstrate they have knowledge and understanding and can apply them. On the other hand, Capey\textsuperscript{27} (1995) recognises that the GNVQ differs significantly from the NVQ in its broader purpose and range, offering a general preparation for work or for further study in a vocational area. This in itself is sufficient to justify a different approach to the assessment outcomes. The implication of this is a further move toward more holistic judgements and away from checking of detailed coverage.

The discussion above validates the move towards evidence collection and holistic performance assessment models by many workplace assessors. Moreover, the work done by Devereux\textsuperscript{28} exploring the uses of professional conversation as a means of collecting evidence of competence has influenced our latest work and further involves the candidate in the assessment process.


\textsuperscript{26} Beaumont, G. (1995) Review of 100 NVQs and SVQs

\textsuperscript{27} Capey, J. (1995) GNVQ Assessment Review

CIL is currently using professional conversation, in conjunction with the collection of supporting documentation and validations as a method to assess the current competence of senior managers against high-level management standards registered on the NQF. This methodology is also being developed for professional registration requirements for a number of professional associations in New Zealand. It is also being used in some industries such as meat processing to assess generic skills such as conflict management and problem solving in workplace situations where it is difficult to gain direct evidence and where simulations have insufficient consequential validity. Initial use of the methodology is giving very promising results in terms of rigour and the requirement for personal reflection by candidates using this process. We will continue to review this approach to determine its applicability in a range of sectors.

CIL is also exploring issues of transferability of competence from one context to another and whether knowledge, within generic competencies in areas such as management, is demonstrated by performance. Work by Capper (1996) continues to address these issues and is being closely monitored by us in our development of assessment methodologies.

**Moderation**

Moderation has become an area of considerable debate in New Zealand. There is no doubt that methods to ensure consistency of assessor judgements need to be implemented. However, it is our view that the methodologies, scope and cost of compliance need to be subject to a cost/benefit analysis to ensure that the moderation tail is not wagging the assessment dog. Moreover, it needs to be remembered that the ultimate form of moderation in workplace assessment lies with the industry purchasing the knowledge and skills. It is our view that good accreditation and internal quality management systems supported by audit and the opinions of the end users are often more effective than nationally operated moderation systems.

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THE MODERATION PROCESS

External moderation is described in *Learning and Assessment*\(^{30}\) as a process that helps to ensure consistency of (assessment) judgements. Strachan (1995)\(^{31}\) proposes a systemic approach to Qualifications Framework moderation, and refers to a wider definition: *moderation comprises all activities that help to ensure consistent interpretation and application of standards.*

Systems to moderate assessor consistency are designed by standards setting bodies in consultation with the Authority’s Framework Development and Moderation Services teams. The systems run by Moderation Services\(^{32}\) have traditionally operated in one of three ways:

These are:

- Moderator based systems: centrally established and nationally directed systems using an hierarchical combination of NZQA personnel, contracted moderators and assessors. These systems can be postal systems or postal and validation systems.
- Cluster based systems: local cluster systems linking a network of local assessors (providers). Membership of each local network is centrally established to ensure cross-sector representation where this is appropriate.
- Inter-provider moderation systems: providers link with at least one other provider assessing registered standards in the same domain.

Most industry training organisations run their own moderation systems, which may also have involvement from Moderation Services in the areas of design and development. These have established a variety of options for operation, some of which are similar to those described above.

It is to be expected that in establishing the part of the NQF quality system which assures the consistency of assessments and assessment results, there will be some initial operating problems, yet it is in this area

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\(^{30}\) *Learning and Assessment* NZQA 1996


\(^{32}\) It should be noted that moderation systems have been the subject of review and are evolving to meet more clearly defined needs in both the workplace and provider sectors.
that some of the most emotive criticism is levelled at the NQF and the New Zealand Qualifications Authority. This is particularly prevalent from the provider sector.

As indicated in the discussion on assessment above, many of the providers are keen to use a collection of evidence model which requires learners to take an active part in planning and collecting evidence of their competence. There may be some specific assessment tasks, usually relating to theory, but the practice which is required by the standards will be subject to the circumstances in which the learner finds themselves. Indeed industry requires this approach when assessing on job performance.

Providers and industry have expressed concern at the implications that some current moderation systems have for the manageability of moderation and the cost of compliance. These models usually require pre-task and assessor judgement moderation.

There are limited precedents elsewhere on which to base a response: Sass and Wagner (1992)\textsuperscript{33}, surveying moderation and its effects during the design of the Qualifications Framework, found that much of the reported work had been undertaken in New Zealand. However, Wolf (1995)\textsuperscript{34} and Black (1994)\textsuperscript{35}, note the effectiveness of networks and the designation of a group of “leader” or “master” teachers in a provider environment. These processes, they argue, will not only improve assessment, but have spin-off into quality of instruction and learning. This may well prove true when used with networks of workplace assessors.

ROLE OF THE MODERATOR

Part of resolving the moderation debate lies in defining the role of the moderator. There are two differing viewpoints in this area. The first viewpoint sees the moderator solely as an auditor/verifier of assessor judgements. Whilst some minimal review of assessment tasks is incumbent within

\textsuperscript{33} Sass and Wagner \textit{Moderation Strategies for Achieving Consistency with Unit Standards} NZCER, Wellington 1992
\textsuperscript{34} Wolf A \textit{Competency Based Assessment} Buckingham: Open University Press 1995
\textsuperscript{35} Black P \textit{Performance Assessment and Accountability} Educational Evaluation and Policy Analysis 16(2) 1994
this role, the key function is to review comparability of standards interpretation and assessor judgements in accordance with this interpretation. Because it is a post-assessment role, this viewpoint has principal impact on later assessment decisions. This is the approach used largely in England and Wales.

The second view, preferred by Scotland and Queensland, is that the moderator has both pre-assessment and post-assessment roles. In the first, assessment tasks and schedules are reviewed to ensure they are of appropriate standard, while the latter verifies that judgements of student work are correct. This role may be involved in raising assessment quality through assisting assessors with advice and training. It has a balance of pre-assessment task review and post-assessment verification. It can be expected to have an additional secondary benefit of professional development, and may thereby hasten the time when less moderation is needed. Moderators may, for example, be involved in exemplar development and cluster group support. Whilst it may be seen as a more broadly based system than the first, the cost of compliance is often very high and its operation, in the workplace, may be difficult. It is often seen as having more relevance in provider based assessment, where training and assessment is the key focus of activities.

In industry, the former system is often regarded as more feasible as most assessors and moderators have the role as a task that is extra to their normal workplace functions. Moreover, there is the view that the ultimate form of moderation lies in the industry or profession itself - productivity, lack of rework and output targets met. Professional membership or registration is also a form of moderation that supports this approach.

Recently CII was contracted to explore alternative systems for moderation in the Electrotechnology Industry Training area, given that this ITO covers eight sector groups.

The outcome was the development of one Moderation Action Plan (MAP) detailing the philosophies and principles by which the ITO wished to operate. The specific policies and procedures for each sector are contained in Sector Policy And Procedure Manuals. The two are linked by way of reference within the MAP to the Manual.

36 This material is discussed with permission from ETITO.
As a result of this approach the Moderation Action Plan is now a one page document of guiding principles. These include the requirement to:

- ensure that assessment is fair, valid and consistent;
- ensure that assessment meets the nationally prescribed standards;
- reflect that the purpose of a moderation system is to detect variance from the standard and to keep the variance to an agreed level;
- ensure that a moderation system should include a process for moderating judgements and monitoring assessment systems and processes;
- reflect that a moderation system should suit the culture of the particular industry sector;
- ensure that a moderation system includes systems and processes that support 'best practice' in assessment which include using an integrated method of assessment based around a collection of evidence model.

The Policies and Procedures Manual for each sector may include but are not limited to the following items:

- Criteria and responsibilities for National Moderator
- Make up of Moderation panel
- Moderation Procedure
- Moderation of Assessment materials
- Reporting
- Candidate surveys
- Non-compliance
- Funding
- Appeals

This new approach to moderation in New Zealand means that the ITO need only to register a moderation action plan which defines the principles and philosophies applying to the industry, while publishing the policies and procedures specific to each sector as a manual. This means any changes which may be required from time to time to a sector’s moderation processes can be dealt with by republishing a revised manual, instead
of going through NZQA's revision procedures. This will significantly decrease the cost of compliance of meeting NZQA requirements, whilst maintaining the assessment rigour required by the industry.

It seems likely that moderation of workplace assessment will continue to be an area for debate and development. CIL will continue to monitor and reflect these developments in its practice in this area.

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Antonio Argüelles studied his BA in economy and german studies at the University of Stanford. Since 1985 he has occupied positions in the public administration in Mexico in the Secretary of Finance and Public Credit, in the Secretary of Commerce and Industrial Development and, since 1995, as Director General of the National College of Technical Professional Education. In this latter position he has overseen the development of competency based education and training in the College. Antonio has published two anthologies on CBET, Competencia laboral y educación basada en normas de competencia (1996) y La educación tecnológica en el mundo (1998), as well as a number of books, co-authored with José Antonio Gómez Mandujano, on modernizing the public administration. Of particular interest is Hacia la reingenieria educativa: El caso del Conalep (1999).

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Andrew Gonczi is actually the Dean of the Faculty of Education of the University of Technology, Sydney (Australia). He has been involved in teaching and research on competency-based education and training for many years and has published widely on the subject. He has dedicated particular attention to the demands and implications of the introduction of competency based systems with particular attention to the areas of curriculum and teacher training.

Articles by Andrew Gonczi published in Spanish can be found in Competencia laboral y educación basada en normas de competencia (1996) and La educación tecnológica en el mundo (1998), both published by Limusa. Prior to his position as Dean of the Faculty of Education, he was Head of the School of Adult Education.
This book examines the implementation of competency based education in a number of countries. Contained in it are examples of how this new approach to vocational education and training (VET) has been developed (and changed) at a national level but there are also examples of pilot projects within educational systems and examples, too, of implementation in particular industries and specific firms.

The editors felt that there was the need, after some 15 years of international experience with competency based approaches to VET to examine what had emerged and changed since its introduction in the United Kingdom. Since that time competency based approaches have been introduced in Australia, New Zealand, South Africa, a number of European countries, and in more recent times in México and in Central America.

All the countries which have introduced competency based education in the last two decades have done so in the recognition that international economic competitiveness has sharpened the need to have a well educated innovative workforce at all occupational levels.

Our hope is that the integrated approach to competency based education which is argued in these chapters will help to revolutionize approaches to education at all levels-school and university as well as technical college levels.

We believe competency based education will not only play an important part in increasing economic competitiveness but also in breaking down the perceived lack of status of VET qualifications which will have a positive impact on the life chances of individuals who possess them.