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Structures and functions of Competency-based Education and Training (CBET): a comparative perspective

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of BMZ Federal Ministry for Economic Cooperation and Development

Imprint

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Introduction

Established on 1 January 2011, GIZ brings together under one roof the long-standing expertise of the Deutscher Entwicklungsdienst (DED) gGmbH (German Development Service), the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH (German Technical Cooperation) and InWEnt – Capacity Building International, Germany. GIZ operates in more than 130 countries worldwide. In Germany we maintain a presence in nearly all federal states.

As a 100% federally owned enterprise, we support the German Government in achieving its objectives in the field of international cooperation for sustainable development.

The section "Human Capacity Development for Vocational Education and Training" is seated in Mannheim and conducts advanced training programmes under the banner of "sustainable development". Its dialogue and training programmes are targeted at decision makers from the public and private sectors, junior managers and multipliers from vocational training systems.

From 2003 onwards, GIZ's section "Human Capacity Development for Vocational Education and Training" is to present a series on everyday practice in vocational training.

The intention of this series is described in the title itself ("Beiträge aus der Praxis der beruflichen Bildung" – series on everyday practice in vocational training). The division aims to support are programmes of the international personnel development in the above-mentioned areas with technical documentation in both printed and electronic form.

These reports

- originate in the partner countries, taking into account specific situational demand
- will be tested with and for experts in vocational training in the partner countries in conjunction with respective practice-oriented training programmes on offer, and
- with a view to global learning, will be improved and adapted prior to publication according to the recommendations of the partners or the results of the pilot events.

Thus, the section "Human Capacity Development for Vocational Education and Training" is applying the requirements of GIZ training programme to its own products in the above faculties: i.e. these can only be as good as their practical relevance for the experts of vocational training system in the partner countries.

To this effect, we look forward to critical and constructive feedback from all readers and users of these special series.

This manual is one of an entire series of GIZ publications that have been produced as a result of training seminars and courses.

Our special thanks go to who made invaluable contributions to these activities.

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1 The Philosophy behind the concept of CBET

1.1 Historical background of CBET

Competency-based Education and Training (CBET) can be traced back to the education of primary and vocational teachers in the USA in the 1970s. Poor learning in vocational education programs was the reason for applying new principles to teacher education. Teaching should be based on the role requirements and standards of the behaviour of effective teachers. The National Center for Research in Vocational Education at Ohio State University started research on "performance-based vocational teacher education" in 1969. Over a period of ten years 100 performance-based modules for vocational education were developed, which were supplemented by modules for adult and special education. In 1977, some 23 states had implemented performance-based vocational teacher education and in the late 1980s the concept shaped many programs of vocational education and training (VET). Despite scepticism from the very beginning, CBET gradually entered the context of VET in the UK, Australia and New Zealand. Several other countries are currently copying the concept of CBET by re-inventing or reforming their VET systems. Many hopes lie on CBET respectively because it is an "outcome-based approach" and is seen as a "major driver, incentive and motivator of learning" where the role of individuals is rated higher than that of teachers, government or other stakeholders (Reuling, 2002, p. 15). Therefore, CBET has both a didactical dimension (competences and qualifications) and a political and social dimension (pathways and opportunities for learning).

1.2 Definition of CBET

CBET is an approach to VET, in which skills, knowledge and attitudes are specified in order to define, steer and help to achieve competence standards, mostly within a kind of national qualifications framework. Competence (e.g. in the British context) or competency (e.g. in the Australian context) can be understood as

- "(...) the specification of knowledge and skill and the application of that knowledge and skill to the standard of performance expected in the workplace".

Consequently, CBET itself may be described as

- "(...) training which is performance- and standards-based and related to realistic workplace practices (...) It is focussed on what learners can do rather than on the courses they have done".

This definition (ANTA, 1998, p. 10; Misko, 1999, p. 3) places the focus of CBET on outcomes measured against industry standards rather than on courses based on institutional arrangements (classes in schools, e.g., or apprenticeships) where individual achievements are normally valued against others. Outcome orientation places emphasis on new forms of assessment. "Recognition" or "Accreditation of Prior Learning" (RPL/APL), mainly through work experience, is another essential tool to ensure the relevance and transferability of skills and knowledge as well as to lead people back into learning.

Competency-based curricula consist of workplace-oriented and performance-based modules or units of competence that can be accumulated to a vocational qualification. Delivery of CBET can be designed individually by learners, teachers and trainers, which allows a self-paced mode independent from courses. However, a modular and self-paced approach to curricula and delivery is not necessary, although it is very compatible with CBET.

A definition of CBET stated by the Australian Chamber of Commerce and Industry in 1992 summarises its characteristics as follows:

- "A way of approaching (vocational) training that places primary emphasis on what a person can do as a result of training (the outcome), and as such represents a shift away from an emphasis on the process involved in training (the inputs). It is concerned with training to industry specific standards rather than an individual's achievement relative to others in the group".

1.3 Structural features of CBET

The Victorian State Training Board (Harris et al., 1995, p. 26) defined six criteria that describe the typical structure of CBET programs. These criteria specify both the micro structure of CBET, i.e. its learning and assessment dimension, and the macro-structure, i.e. its institutional framework. The criteria were defined for the Australian system but can be summarised in a generalised form in the following tables:

Figure 1: Micro structure of CBET

Outcome criterion
The course is recognised to meet national competence standards that have been endorsed by a national authority. In the absence of national standards, course outcomes should be based on the authority's definition of competence and endorsed by industry training boards or by relevant industry parties where industry training board coverage is not appropriate.
Curricular criterion
The curriculum gives learners a clear indication of what is expected of them in terms of performance, conditions and standard. Also, if appropriate, workplace and off-the-job training and assessment responsibilities should be identified.
Delivery criterion
Delivery is flexible and learners can exercise initiative in the learning process. Learning materials used by providers indicate the degree to which program delivery is learner-centred.
Assessment criterion
Assessment should: ▸ Measure performance demonstrated against a specified competence standard; ▸ Be available for competences gained outside the course; ▸ Include workplace or off-the-job components if appropriate.
Reporting / recording criterion
Reports of competences gained should be provided to learners. Reporting may be in terms of completed modules provided that the relationship between competences and modules is understood.
Certification criterion
Persons demonstrating all prescribed competences in an accredited course or training program should obtain a credential or statement of attainment which is recognised within the national framework.

Source: Victorian State Training Board, 1992

The criteria specifying the micro structure of CBET in figure 1 primarily refer to the design and realisation of the learning process. Besides, four criteria that shape the political and regulative framework of CBET can be identified:

Figure 2: Macro structure of CBET

System criterion

The system, in which CBET is implemented, is marketoriented and a major influence of the industry is prevalent. The educational system is dominated by the general education sector and VET.

Policy criterion

The philosophy of workplace-based training and the concept of competence define the VET system. Although the government passes policies industry plays a major role.

Authority criterion

Industry is in charge of training, lead bodies define standards and awarding bodies are authorised to carry out workplace and off-the-job assessment.

Regulative criterion

Legal regulations are limited due to demanded flexibility by industry.

1.4 Objectives of CBET

CBET aims at preparing learners more effectively for real workplaces, which means that the acquisition of competences takes into account the requirements of companies and industry. Furthermore, CBET should enable employees not only to increase their knowledge and skills at the workplace but also to gain nationally accredited certificates for workplace-based learning. The self-paced and flexible structure of CBET programs should encourage learners to become responsible for their individual learning process. The modular structure allows for individual combinations of competences limited only by certain "packaging rules" which refer to accredited national vocational qualifications.

The objectives of nationally endorsed competence standards as the core of CBET are on the one hand to transform the requirements of industry and enterprises into the world of learning. On the other hand, standards shall provide transparency of competences underlying vocational qualifications.

2 Realisation and implementation of CBET

2.1 Requirements for the successful implementation of CBET

According to Harris et al. (1995, p. 206) a number of reflective questions referring to three categories (knowledge, skills and attitudes) need to be clarified before implementing CBET:

Figure 3: Implementing CBET

Knowledge

1. How well do we understand the context of the current VET system and the role of CBET in furthering the system?
2. How confidently can we explain CBET's key characteristics, advantages and limitations, components and potential alternatives?

Skills

3. How well can we perform the following functions?
   - Orient others to CBET
   - Design a CBET program
   - Obtain/deliver learning materials and resources
   - Establish appropriate facilities
   - Develop procedures for managing CBET
   - Foster partnerships between education and industry

Attitudes

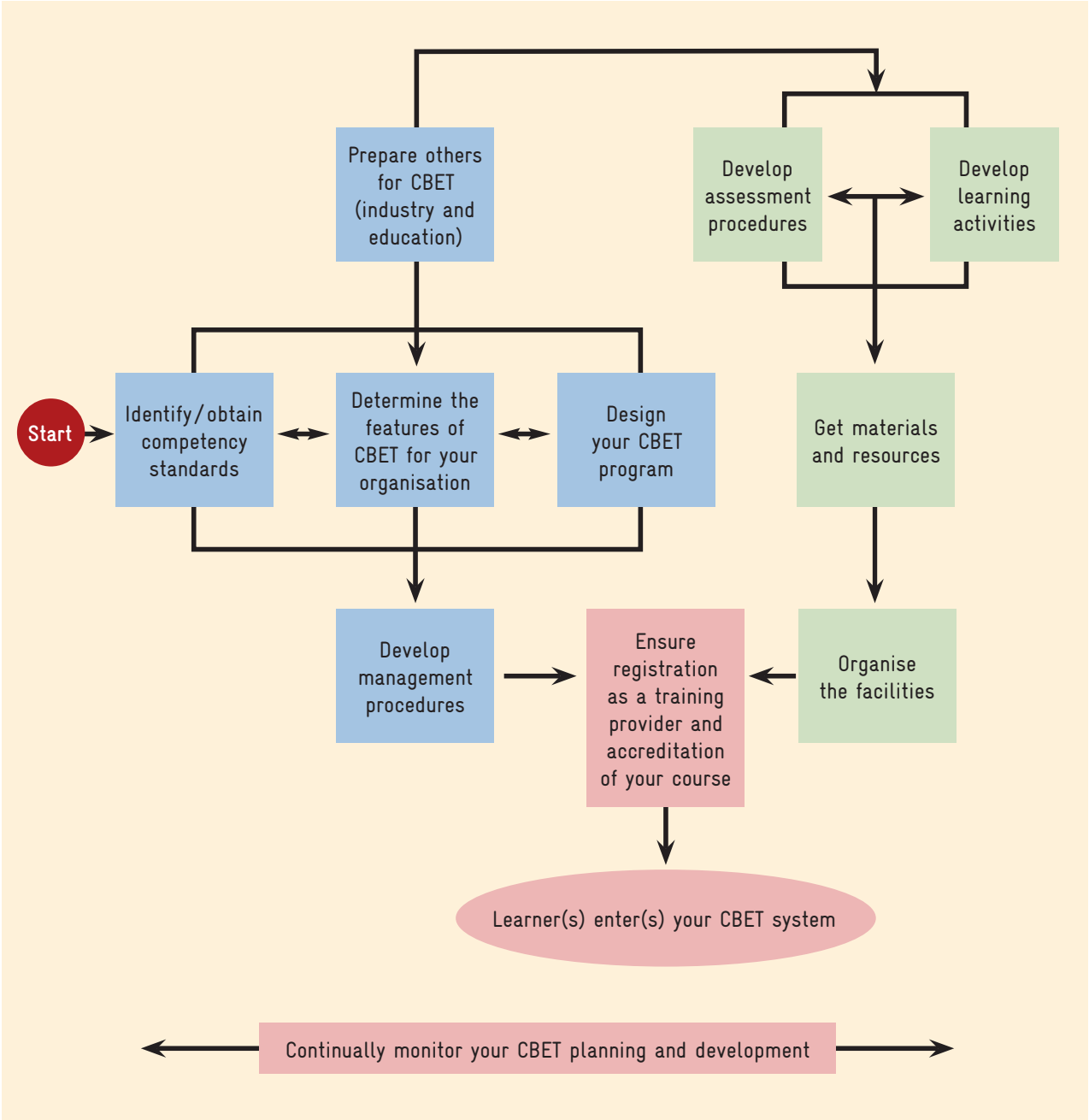
4. How enthusiastic are we about CBET, about applying the principles in practice and overcoming the barriers and solving the problems that are bound to emerge with a new program?
5. How comfortable are we with the philosophy of CBET?
6. How strongly do we believe in the potential of the CBET system?
7. How open-minded are we about pushing ahead into the relative unknown that lies ahead?

Thus, for a successful implementation of CBET it is important to understand that CBET is a new approach and different to traditional course-based teaching and training. Furthermore it is important for teachers and trainers to be well informed about the concept and prepared for its realisation. Assessment plays a major role in the new concept and the requirements for appropriate assessment procedures must be made clear to assessors as well as teachers and trainers.

2.2 Planning and developing CBET

The design of CBET programs requires careful planning and continuous monitoring of development steps. The first step is to define competence standards by translating work-based requirements into nationally endorsed industry standards. This requires experts in relevant occupational fields who are able to depict essential work activities, tasks and functions with respect to a specific competence profile. The methods applied can either be DACUM or functional analysis (see 2.3 for more details). Furthermore, the forms of delivery and assessment need to be specified in accordance with the respective training provider. Thus, the learning environment of workplaces or training providers must be defined and resources and learning materials obtained. Information on assessment requirements and procedures must be distributed to learners and trainers by registered assessors. The organisation and management of CBET programs has to be efficient to assure the quality of outcomes and learning processes. A model of the planning and developing process of CBET is shown in figure 4.

Figure 4: Planning and developing CBET



Source: Harris et al., 1995, p. 209

2.3 Curriculum development in the CBET world

Creating a curriculum is one of the essential functions within an education or training system as it constitutes the guideline for planning, conducting and assessing learning processes. Curriculum development can be approached from three different perspectives (Smith/ Keating, 2003, p. 121):

- The first perspective is to regard it as "rational" or "linear", i.e. it is a logical process which proceeds from objectives to the selection of learning experiences to the organisation of learning material to evaluation.
- The second one sees curriculum development as a "cyclical" model, where the whole learning process is a cycle which continually renews itself so that evaluation leads to the reformulation of objectives.
- The third perspective implies an "interactive" model assuming that curriculum development can commence at any stage and that feedback leads to constant change at any stage.

The two most commonly used methods for curriculum development – DACUM and functional analysis – can be rated and described as linear models.

DACUM (acronym for develop a curriculum) is a method to define systematically the tasks, jobs, competences and tools associated with a certain type of workplace. DACUM is an inductive approach, i.e. small units are defined and gradually extended to be applied in a broad context. Three assumptions are underlying DACUM: First, persons who do certain activities regularly can describe them in a realistic and precise manner. Second, an efficient way of work and job analysis is to describe the tasks of a specialist precisely and completely and third, every successfully completed task requires special knowledge, skills, equipment and behaviour, which can be identified implicitly through work and job analysis.

The job analysis that is required by DACUM includes several aspects such as the analysis of occupations, jobs, duties, tasks and single work steps. Additional issues such as workers behaviour, general knowledge and skills, tools, equipment, supplies and materials as well as future concerns should be considered. Gonczi/Hager/ Oliver (1990, p. 38) defined steps to be undertaken in order to set up and conduct a DACUM procedure:

- First, it is necessary to choose an expert facilitator and select participants from various levels of the relevant occupation. Participants must have a profound knowledge of the occupation and it is important that different interests (e.g. educators, practitioners, unionists) are involved.
- Second, a pre-DACUM session must be organised in order to explain the process of curriculum development.

At the beginning of the session, the facilitator has to give a general introduction to and review of the occupational area. Then the main duties within the occupation must be outlined and associated tasks, sub tasks and required competences must be identified. Additionally, the importance of each task, sub task and competence must be rated according to its frequency of performance and its importance for a holistic work performance. The results must be structured and recorded for a final report, which is disseminated to the relevant authorities. The steps of a typical DACUM session are outlined in figure 5.

Figure 5: Conducting a DACUM session

1. General introduction and orientation.
2. Review of occupational area.
3. Identification of the duties.
4. Identification of tasks, sub tasks and competences associated with each duty.
5. Reviewing and refining the outcomes so far.
6. Establishing importance of each task and/or competence by rating on frequency ofperformance, essentialness etc.
7. Final structuring
8. Recording of final results.
9. Preparing report.

Source: Gonczi/Hager/Oliver, 1990, p. 39.

Problems articulated with regard to DACUM are that mainly the status quo of a job description is taken into account and that methodical aspects as well as assessment designs are disregarded. To address this problem a holistic approach to curriculum development is necessary, which determines not only learning targets in terms of competence standards, but also respective and appropriate assessment guidelines as well as methodical support for teachers or instructors. An example of such an approach can be found in the Australian concept of "training packages", which is described in more detail in chapter 4.1. Critics also claim that DACUM is time-consuming and complex. However, it seems unrealistic to set up appropriate procedures that generate elaborated curricula within a short period of time.

Functional analysis is another method for curriculum development that is widely used in the UK in a variety of industries. Functional analysis is a deductive and target-oriented approach (Gonczi/Hager/Oliver, 1990, p. 43). In the analysis the central task of an occupation is defined and complex functions are derived. Furthermore, basic sub-functions and simple tasks are derived from complex functions of the occupation. Therefore, functional analysis may be characterised as a process of disaggregating complex functions into smaller components, where functions are the defined outcome of a realised activity without describing the specific context of the activity. Functional analysis leads to small units and elements of competence which compose the design of a competence standard.

A problem articulated in this respect is that functions should be generally defined, although they are not necessarily suitable for all different contexts. Another difficulty is that the complexity of work processes and occupations cannot be simply addressed by disaggregating complex functions into smaller units.

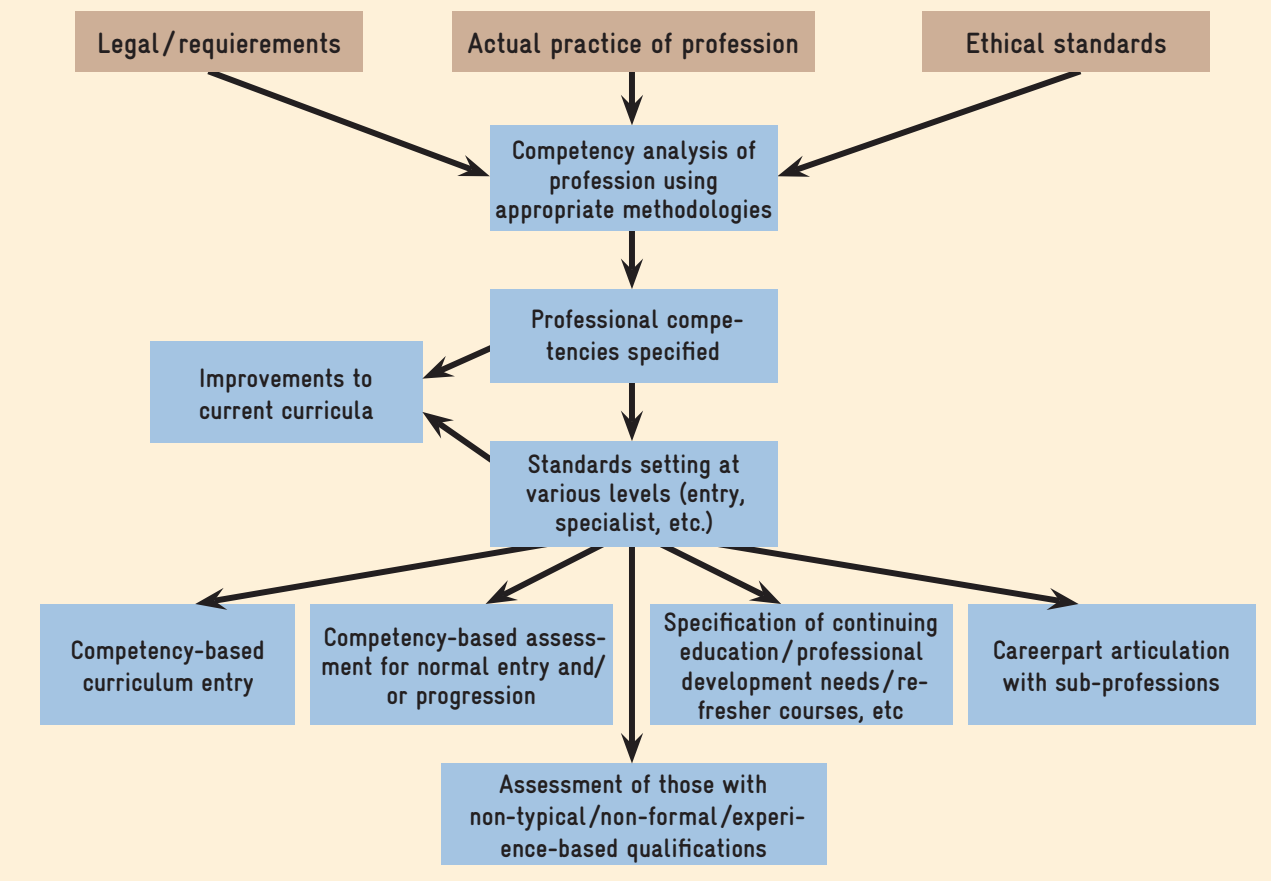
Although both functional analysis and DACUM are complex procedures that require sufficient expertise from practitioners they depict the most commonly used methods for curriculum development in CBET. Other methods such as expert interviews, questionnaires, Delphi or CODAP (Gonczi/Hager/Oliver, 1990) could not be established as appropriate tools for curriculum development within CBET on a big scale.

2.4 Competence standards

Competence standards are the core feature of a Competency-based curriculum, since they are an important instrument for identifying training needs, specifying career paths and recruiting personnel (Gonczi/Hager/Oliver, 1990, p. 35). Competence standards can be categorised into three types, namely industry standards, cross-industry standards and enterprise standards (Harris et al., 1995, p. 105). Industry standards refer to units of competence that are required in a range of workplaces within a certain industry. Cross-industry standards share common units of competence and are integrated into industry standards. Enterprise standards are developed and implemented at the level of an individual company and are usually a specification of industry standards as additional units are added, replaced or modified. Although the flexible development of standards at the enterprise level is important to address individual needs, national consistency and acceptance of competences across industries or even nation-wide must be preserved. Therefore, authorised institutions approve these enterprise standards before they are endorsed.

Industry bodies representing the interests of managers, industry trainers and assessors develop all three kinds of standards. Before applying a method to create a curriculum for CBET it is necessary to analyse the legal, ethical and practical context in which competence standards are to be endorsed. The discrete components (tasks, jobs, duties) identified through either DACUM or functional analysis must be translated into the competence standard format illustrated in figure 7. Furthermore, levels for the standards must be determined according to the complexity and severity of the various competences. Finally, appropriate assessment procedures have to be set up, since the efficiency of competence standards relies heavily on the quality of their verification. The process of developing competence standards is illustrated in figure 6.

Figure 6: Developing competence standards

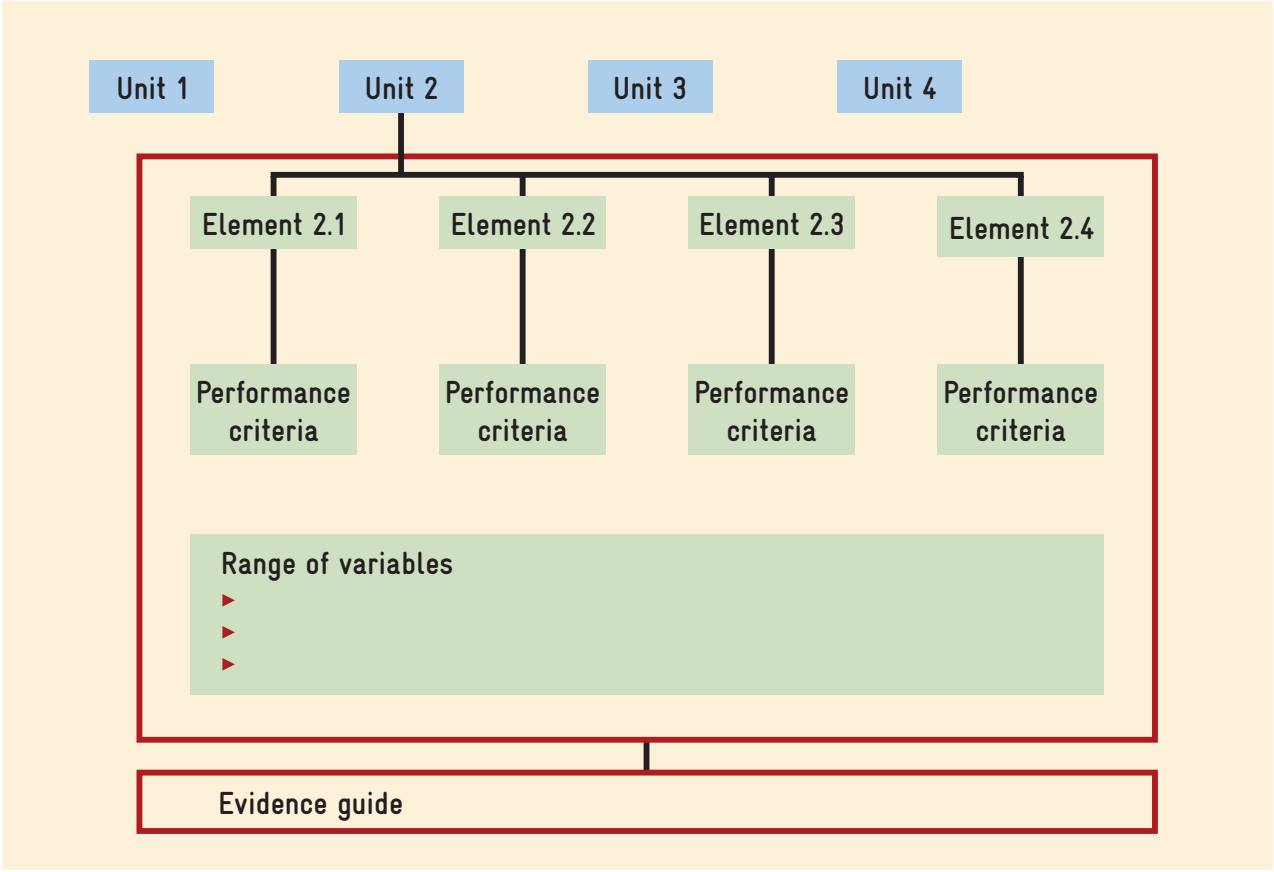


Source: Gonczi/Hager/Oliver, 1990, p. 12

Format of a competence standard

The typical format of a competence standard consists of units of competence, elements of competence and performance criteria. Moreover, the system makes use of range variables and an evidence guide for the learner. Units of competence consist of a coherent group of elements of competence and associated performance criteria. Units function as modules or sub-areas of competence profiles defining a vocational qualification and are supposed to have an independent value on the labour market. Thus, even if a national qualification is not entirely achieved, the awarded units of competence already qualify an individual seeking employment. Elements of competence as the smallest components making up a competence profile or standard provide a detailed description of individual competences (perceived as workplace activities) and are closely linked to performance criteria (Jessup, 1991, p. 32). Performance criteria prescribe the level or standard for a competent performance of a task, function or activity by indicating what needs to be achieved for the successful performance of a certain element. In order to set the range of application for an element of competence so called range variables are added. They outline the scope of the activity in material or personal terms (Ertl, 2000, p. 53).

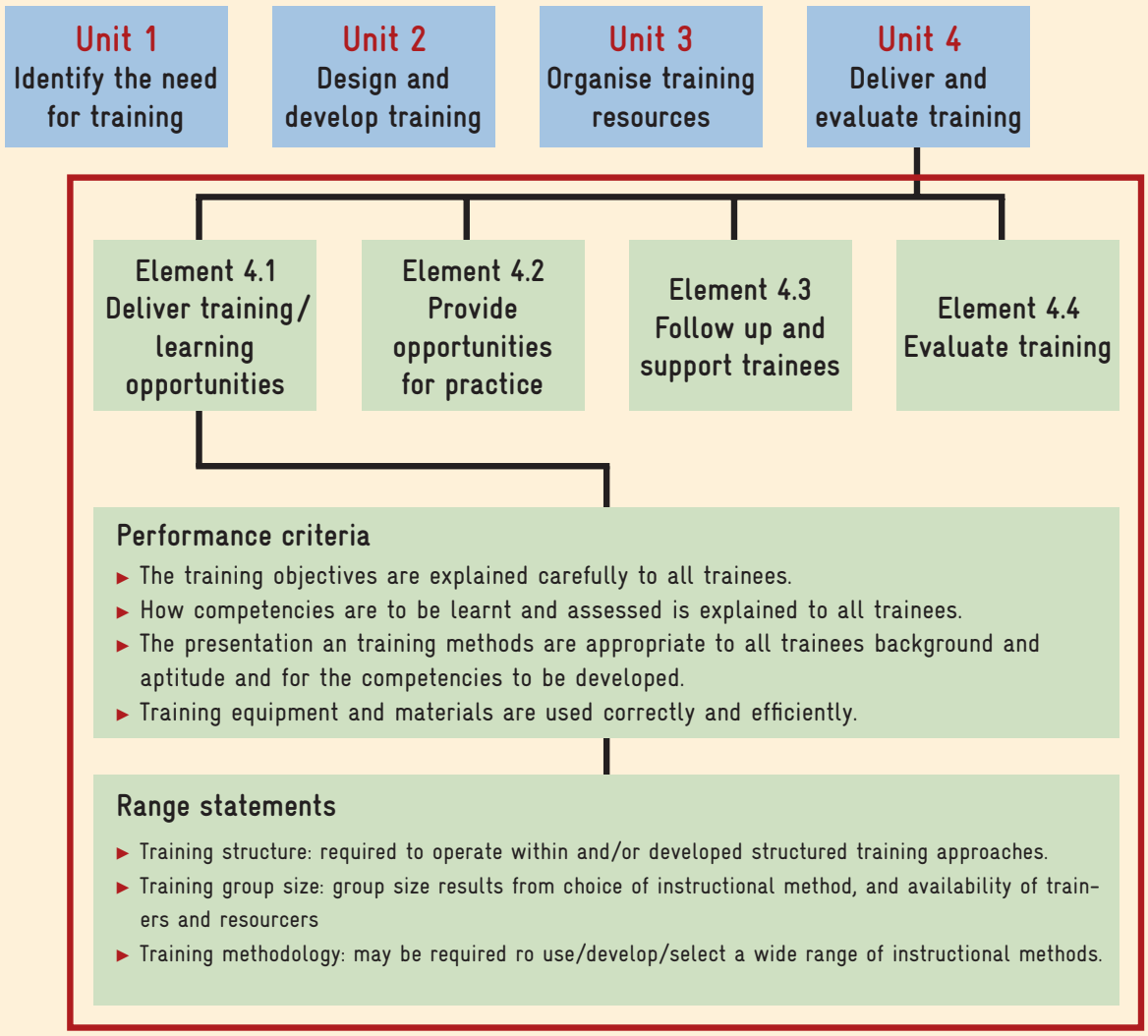
Figure 7: Format for competence standards



Source: Harris et al., 1995, p. 107

To illustrate a competence standard extracts from a standard for workplace trainers as stated by the Australian Competency Standard Body are given below.

Figure 8: Competence standard for workplace trainers



Source: Harris et al., 1995, pp. 108

2.5 Assessment

With the shift from processes to outcomes assessment has to be rethought and re-defined as it is indispensable for the verification and valorisation of competences. Wolf (1995, p. 1) defines assessment in CBET programs as follows:

- "Competency-based assessment is a form of assessment that is derived from the specification of a set of outcomes; that so clearly states both the outcomes – general and specific – that assessors, students and interested third parties can all make reasonably objective judgements with respect to student achievement or nonachievement of these outcomes; and that certifies student progress on the basis of demonstrated achievement of these outcomes. Assessments are not tied to time served in formal educational settings".

It is the outcomes and not the learning processes or courses which are assessed. Outcomes have to be clearly identifiable as such in order to assure transparent and reliable assessment procedures. Outcomes are the "real side" of a competence standard and according to the CBET philosophy it is essential to conduct assessment strictly in accordance with these standards irrespective of the learning process or the circumstances involved. However, it also means an individual decides which element of competence should be assessed and the assessor then only measures the demonstrated performance in line with the relevant criteria. Every single criterion must be fully met before the assessor can judge the performance as competent, otherwise the assessment must be repeated. Graded assessment is not encountered in Competency-based assessment. Competency-based assessment is conducted on demand and under conditions which should come as close as possible to real workplaces (Wolf, 1995, pp. 21). CBET assessment does not require a peer group to measure an individual's achievement against others, i.e. norm-referenced assessment, as it is criterion-referenced, i.e. achievements are measured against the respective competence standard. The differences between traditional and Competency-based approaches to assessment are illustrated in figure 9.

Figure 9: Different approaches to assessment

Features of tasks/situations	Performance approach	Performance approach
1. Task format	Closed (multiple choice)	Open ended
2. Required skills	Narrow, specific	High order, complex
3. Environment relation	Context free	Context sensitive
4. Task / requirement	Limited scope, single and isolated skills, short time processing	Complex problems, requiring several types of performances and significant time
5. Social relations	Individual	Individual or group performance
6. Choices	Restricted	Significant degrees

Source: Baker et al., 1993

Principles of assessment

In order to conduct Competency-based assessment it is not only important to understand and apply the technical procedure, but also to be aware of certain principles. According to the Australian Vocational Education, Employment and Training Advisory Committee (now ANTA) four principles, namely validity, reliability, flexibility and fairness are essential features of good assessment. Validity requires that assessments actually assess what they claim to assess. Reliability demands for methods and procedures that consistently measure the achievements from different learners over time. Fairness is given when assessment is equitable, accessible, transparent and participatory for all, i.e. individual learners must not be disadvantaged. Flexibility requires that a range of assessment methods, referring to a range of delivery modes, learning sites and needs, is provided. These principles are specified in more detail in figure 10.

Types of assessment

One of the characteristics (and claimed advantages) of CBET is that the learning process can be designed individually by learners, teachers and/or trainers to assure flexibility. Consequently assessment procedures cannot be restricted to one standard method, but must provide a range of different methods that can be applied according to the needs and potentials of learners and assessors. Assessment can be conducted as an observation of processes or products on the job, as a skills test in which a certain practical sample of a skill must be demonstrated or as a simulation of work activities, which is normally conducted off the job. Formerly gained competences can be assessed through the provision of evidence of these competences. Furthermore, more traditional forms of assessment such as oral or written tests can be applied especially with regard to assessment of underpinning theoretical knowledge. The different types of assessment with the respective methods and processes are described in more detail in figure 11.

Figure 10: Principles of assessment

Validity

1. Assessment will cover the range of skills and knowledge sufficient to demonstrate competence.
2. Assessment of competence should be a process which integrates knowledge and skills with their practical application.
3. During assessment, judgements to determine a learner's competence should, wherever practicable, be made on evidence gathered on a number of occasions and in a variety of contexts or situations.

Reliability

4. Assessment practices should be monitored and reviewed to ensure that there is consistency in the collection and interpretation of evidence.
5. Assessors must be competent in terms of the national competence standards for assessors.

Flexibility

6. Assessment should cover both the on- and off-the job components of training.
7. Assessment procedures should provide for the recognition of competences no matter how, where or when they have been acquired.
8. Assessment procedures should be made accessible to learners so that learners can proceed readily from one competence standard to another.

Fairness

9. Assessment practices and methods must be equitable to all groups of learners.
10. Assessment procedures and the criteria for judging performance must be made clear to all learners seeking assessment.
11. There should be a participatory approach to assessment. The process of assessment should be jointly developed/agreed between assessor and the assessed.
12. Opportunities must be provided to allow learners to challenge assessments and provision must be made for re-assessment.

Source: Baker et al., 1993

Figure 11: Types of assessment

Assessment form	Observation
Methods	Product and/or process on-the-job
Type	Checklists, rating scales, log books, skills books, work experience diary, interaction analysis, peer assessments, time series analysis
Testing process	Checking, categorising, rating

Assessment form	Skills tests
Methods	Work sample, skill sample, practical project
Type	Checklists, rating scales, research tasks, assignments
Testing process	Checking, categorising, rating

Assessment form	Simulations
Methods	Simulation, observation of product and/or process
Type	Case studies, simulators, computer-adaptive tests, faults-findings
Testing process	Checking, categorising, rating

Assessment form	Evidence of prior learning/achievement
Methods	Examination of evidence
Type	Certification, transcripts, portfolios
Testing process	Checking, categorising, rating

Assessment form	Questioning
Methods	Oral, written, questioning
Type	Supply answer (short answer, restricted essay, extended essay) vs. select answer (multiple choice, matching, completion, truefalse, alternate answer, identification), viva voce or oral exam, self-ratings
Testing process	Checking, categorising, rating

Source: Hager et al., 1994, pp. 49

2.6 Recognition /accreditation of prior learning (RPL / APL)

The idea of flexible and individual acquisition of competences in CBET which is independent from courses provides the basis for open learning arrangements. In order to allow for and accredit the competences in the context of RPL/APL, however, two main issues arise:

1. How can an individual's competence as demonstrated through past experience be related to the standards required by qualifications?

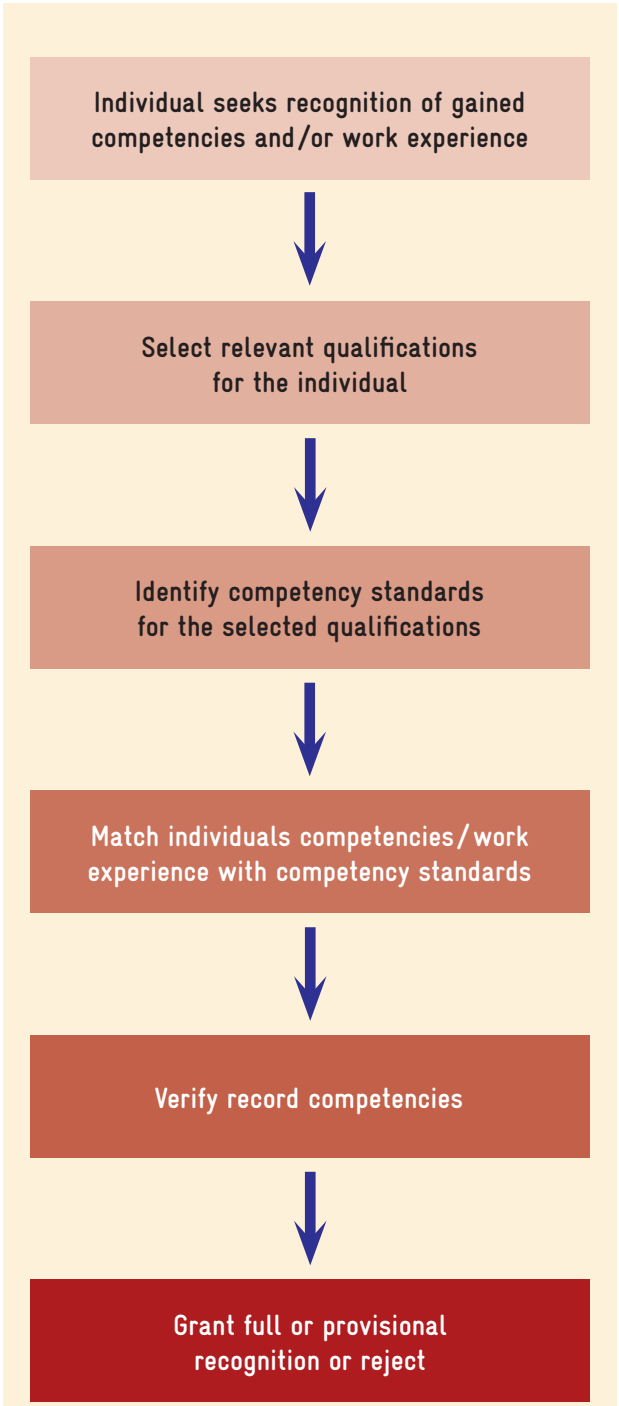
2. How can an individual's competence gained in the past reliably be measured, accredited and certificated?

The process of RPL/APL starts with an individual seeking recognition for work experience or other non-certified competences. Then a qualification accredited in the national framework which matches the individual needs must be selected. For this selected qualification the respective competence standards have to be identified and the competences will then be measured against these standards and verified through formal assessment. If the competence is successfully assessed full recognition is certified. If the standards are only partially met, partial recognition is possible. A model of the process of RPL/APL is given in figure 12.

For the process of RPL/APL it is necessary that approved local assessment centres provide open access to assessment independent from learning programmes or courses (Harris et al., 1995, pp. 164). Furthermore candidates who apply for RPL/APL must be well informed about the process and the competences they are eligible to claim recognition for.

The typical process and the preconditions of APL/RPL give a clear picture of what is expected both from the individual and the assessor or verifier. As doubts about the reliability and validity of RPL/APL still exist, the Australian Vocational Education, Employment and Training Advisory Committee (Harris et al., 1995, p. 80) defined five principles that ought to be considered:

Figure 12: Process of RPL / APL



Source: Harris et al., 1995, p. 166

1. Competence: focus on competences, not on how, when or where they were gained

2. Commitment: training providers must have demonstrable commitment to APL/RPL

3. Access: available to all applicants

4. Fairness: processes must be fair to all candidates

5. Support: provision of adequate support to all applicants

Nevertheless problems continue to be discussed and articulated. It stills seems difficult to define and supply appropriate evidence for the recognition of competences, thus different forms of evidence have been applied. Evidence for gained competences can be provided as products or artefacts (e.g. written reports, design, computer programs, machine tools), as documentation (e.g. job description, production schedules, accounts) or as endorsements of performance (e.g. previous certificates, letter of validation). Another problem is that candidates mostly have partial competences and need further training tailored in a way which leads them to gain full qualifications. Furthermore, it is a time-consuming process to identify prior experiences as relevant competences, assess the evidence and plan, design and envisage continuing training. There are also doubts whether the problem of transparency, reliability and validity of accreditation processes has been solved yet.

2.7 Key competences

The objective behind the idea of key competences within CBET is to have a set of generally applicable competences facilitating the employability of young people who enter the labour market. Key competences should underpin technical knowledge and skills and assure the transfer of skills and knowledge in different learning and work environments. Especially in Anglophone countries key competences, as an integral part of CBET, have been embedded in different programs. Although there is no consensus on what key competences really are, some common traits across borders can be identified which are obviously associated with this pedagogical concept:

Figure 13: Key competences

Australia Key competences	UK Core skills	USA Workplace know-how
Collecting, analysing and organising information	Communication	Information, foundation skills (basic skills)
Communicating ideas and information	Communication, personal skills (improving own learning and performance)	Information, foundation skills (basic skills)
Planning and organising activities	Personal skills (improving own learning and performance)	Resources, foundation skills (personal qualities)
Working with others and in teams	Personal skills (working with others)	Interpersonal skills
Using mathematical ideas and techniques	Innumeracy (application of number)	Foundation skills (basic skills)
Solving problems	Problem solving	Foundation skills (thinking skills)
Using technology	Information technology	Technology systems
	Modern foreign language	

Source: Harris et al., 1995, p. 97

2.8 Methodical aspects

Conducting CBET programs requires a shift from traditional teaching to flexible delivery and learning. The learner has more responsibility for the learning process, however teachers and trainers must be able to support and guide the individual by offering appropriate learning materials and facilities as well as assessment procedures.

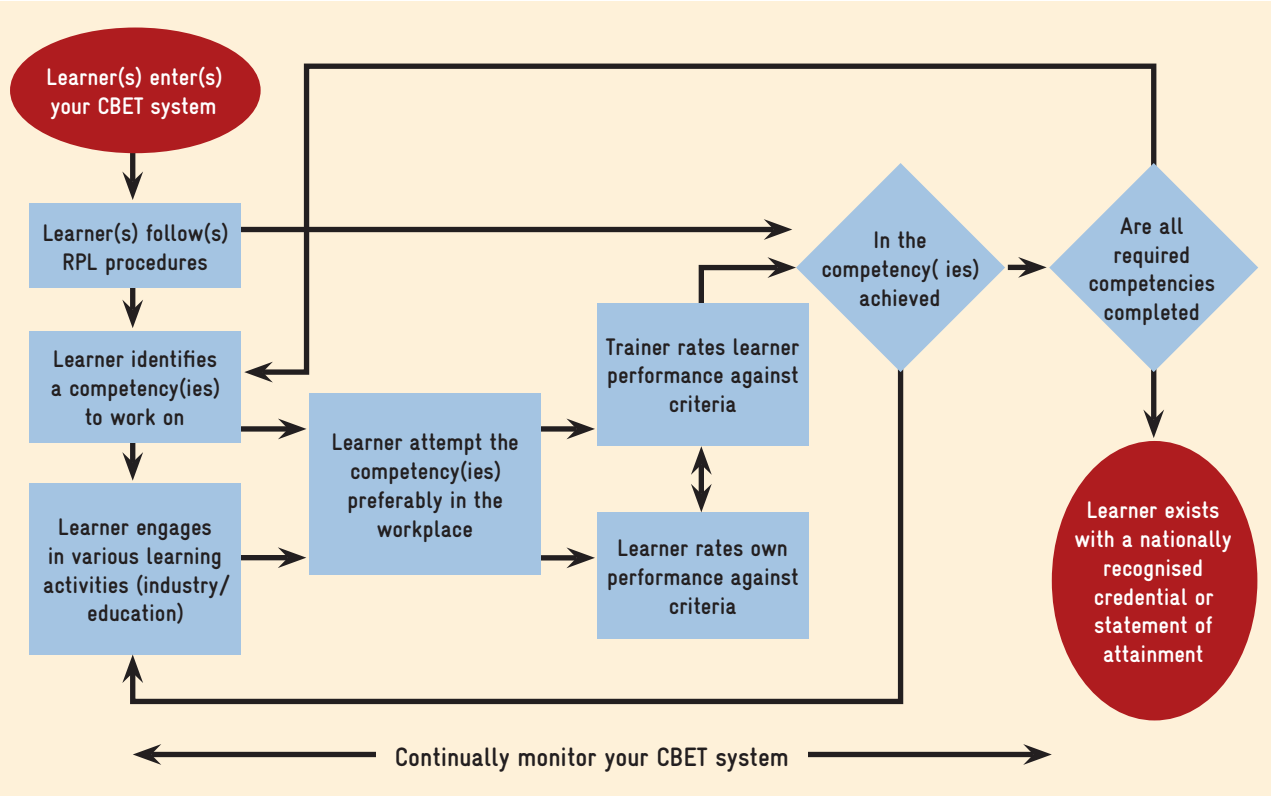
Learning in a CBET program

As indicated above CBET favours, recommends and sets the scene for a self-paced mode of learning and the flexible delivery of competences. However, this does not mean that learning is totally unstructured:

- First, it is important to allow for APL/RPL in order to identify the competences already gained and avoid redundant assessment.
- Second, an analysis of the competences the learner wants to achieve must be undertaken. This includes a context analysis, i.e. which competences are available, where can they be awarded, which learning activity will be appropriate and who will guide the activity.
- Third, the learner undertakes the activity and the performance is measured against specified criteria stated in the competence standard.
- Finally, the assessor confirms whether all required elements of competence have been successfully achieved. If this is the case the learner receives a nationally recognised certificate.

The whole process of learning in a CBET program is illustrated in figures 14 and 15.

Figure 14: Learning in a CBET program



Source: Harris et al., 1995, p. 210

Figure 15: Process model of CBET

1. Initial assessment and APL/RPL
Draw a profile of the learner Assess the competences of the learner
2. Guidance
Give the learner guidance on what competences can be pursued Discover learning opportunities Discuss functions and requirements of anticipated qualifications and occupations
3. Action planning
Define targets for future learning Combine educational and training targets
4. Programs of learning
Define learning process (workplace, college, open learning) Be open to more than one learning site and form of learning material
5. Continuous assessment
Assess competences while they are practised and demonstrated Accumulate evidence
6. Unit credit
Accumulate credits and record them in an individual's National Record
7. Completion of action plan
Result is the award of an NVQ

Source: Jessup, 1991, p. 89

3 Contrasts between traditional and CBET programs

As pointed out above CBET programs constitute a different approach to vocational training as opposed to traditional course-based programs. Contrasts are apparent with regard to national standards, credentials, assessment, credit transfer, accreditation and recognition of competences and prior learning. Furthermore, the requirements for training providers are stated nationally in a CBET system, whereas in traditional programs there might be regional differences. These aspects are contrasted in more detail in figure 16 and the perceived advantage for each aspect is indicated as well.

Figure 16: Traditional versus CBET programs

	Registered credentials
Traditional approaches	Series of credentials in each state/territory, often with little relationship to each other. Similar credentials often known under different names.
CBET approaches	Credentials are registered and recognised nationally.
Perceived advantages	National consistency in the meaning of credentials. Credentials are fully portable across industries.

	Proof of competency
Traditional approaches	Credentials indicate holder has successfully completed a course, but do not indicate level of competence.
CBET approaches	Credentials indicate holder has achieved specific competences to specific standards.
Perceived advantages	Credentials certify holder's ability to do a range of jobs. Credentials give proof that specific knowledge has been acquired.

	Accreditation
Traditional approaches	Accreditation process might differ according to regional structures.
CBET approaches	Accreditation is by single authority, nationally recognised.
Perceived advantages	Standards for assessment are provided for consistent national recognition of credentials.

	National standards
Traditional approaches	Curriculum is based on the time spent in training and the expectation that knowledge would be gained.
CBET approaches	Curriculum is based on competences derived from industry needs and based on endorsed national standards. Confusion is minimised because all terms are used nationally.
Perceived advantages	Assurance that: ▸ Learners gain competences of recognised national standard ▸ Competences reflect need ▸ There is consistency in awards ▸ Learners' rate of progress hinges on competence.

	Consistent outcomes
Traditional approaches	Courses and outcomes are dependent on individual trainers so can be inconsistent.
CBET approaches	Courses centred on achievement of competence.
Perceived advantages	More efficient training courses/programs. Outcomes directly benefit learners, increasing their motivation.

	Registration of providers
Traditional approaches	Recognised providers in public institutions. Private providers have minimum standing. Any registration differs regionally. In-company training has little or no formal status.
CBET approaches	Training providers will be registered and their quality monitored. Registration will be valid nationally. Training courses are to be submitted for accreditation.
Perceived advantages	A wider range of providers. Recognition of valid competences in registered credentials. Closer integration of public and private training efforts. Better use of expertise in the community.

	National standards
Traditional approaches	No structured system of recognition; learners have to challenge authorities to gain credit. Credit for prior learning is open to interpretation.
CBET approaches	Current competences will be recognised through a formal system of RPL and credits. Less duplication of learning activity.
Perceived advantages	Reliable process of RPL assigned, regardless of where or how competences were attained. Encouragement for people to complete further qualifications and extend competence.

	Transfer of credits
Traditional approaches	Ad hoc transfer of credits from one course to another.
CBET approaches	Credit transfer process is structured in the credentials system.
Perceived advantages	Recognition for learning is built into the national system.

	Assessment
Traditional approaches	Assessment of learning achievement varies regionally with different types of examination.
CBET approaches	Assessment is directly related to the achievement of competences specified.
Perceived advantages	Guarantee that a registered credential certifies competency of the holder before training commences.

Source: Harris et al., 1995, pp. 27

According to figure 16 CBET seems to provide several advantages compared to traditional courses. However, especially with regard to the realisation of CBET programs certain problems can be identified. This includes for example a limited perspective on observable outcomes rather than processes, which disregards underpinning and conceptual knowledge. A summary of perceived strengths and weaknesses according to different studies (Misko, 1999; Mulcahy/James, 1999; Billet et al., 1999) is given in figure 17.

Figure 17: Strengths and weaknesses of CBET programs

Strengths	Weaknesses
Nationally agreed objectives are established by government agencies, employers and employees with one regulative statutory body	Focus on observable outcome and performance and not on learning processes
National standards ensure transparency of qualifications and employability	Problem of accreditation of underpinning knowledge
Experts define competence standards and the required knowledge, skills and attitudes	Conceptual understanding of a workplace is not achieved due to superficial learning
Relevance of industry and enterprise needs is reflected in the competence standards due to industry-led DACUM or functional analysis	Fragmentation of training and learning -> few connections between tasks
Complementary evidence of underpinning knowledge is required, i.e. knowing what, how and why certain actions are taken	Concern that only minimum standards of performance are to be met
Enables a learner-centred approach: students decide when, where and how they learn	Competence standards reflect only the requirements of large enterprises, small businesses are underrepresented
Self-paced learning enables students to develop competences they would not develop in a traditional classroom	Working environments change often and unpredictably, which makes it difficult to identify competence standards that respond in a flexible and effective way to organisational changes and innovations
CBET increases students' competence and diversifies skills and knowledge	Modules are based on uniform strategies, which are not equally appropriate for all learners
CBET addresses individual needs	Concern about valid and reliable assessment: one test at the end of a module does not reveal the real competence
Modules increase flexibility in timetabling and updating courses	Lack of skilled personnel for providing workplace assessment
Assessment of modules enable learners to repeat a module when it is not achieved without having to repeat a whole course or unit	Deficits in training of vocational teachers -> little motivation to teach according to CBET imperatives
CBET functions as a mechanism for economic survival in times of technological change and increased competition due to globalisation	Danger of misinterpreting standards due to different resources material for delivering the standards

4 Comparative perspective on CBET

The implementation of CBET in individual countries has to be seen as part of wider reforms in the VET sector. New approaches to training generating a flexible and skilled workforce in order to reduce unemployment especially among young people were needed. CBET was also implemented to increase the recognition of VET, the social acceptance and the take-up of vocational qualifications, especially among school-leavers. Another reason was the need of standards and frameworks to provide a coherent and transparent VET system. At the same time, the introduction of CBET aimed at increasing the influence of industry on VET. Enterprises should be involved in curriculum development by setting standards for competences required in workplaces and should also contribute to delivery by functioning as accredited training providers.

4.1 Australia

The discussion on CBET entered Australian VET policy and research in the mid-1980s. Various government committees and working parties suggested a new approach to apprenticeships and other forms of training that should be based on standards and competence. An official statement called "Improving Australia's Training System" by the Minister of Employment, Education and Training in 1989 called for reforms including CBET, more flexible, broadly-based and modular training arrangements, national consistency in training standards and certification as well as better articulation of on-the-job and off-the-job training and credit transfer (Harris et al., 1995, p. 51). This statement triggered the decision to implement a CBET system and establish a national framework for accreditation of qualifications. Competence standard bodies were established to develop standards and define coherent vocational qualifications that can be integrated into a national qualifications framework combining secondary schools and training, vocational education and higher education. The first framework was introduced in 1994, however a Competency-based system was not yet achieved nationally. The introduction of "training packages" in 1997 shaped a new format for a Competency-based curriculum and contributed to a better understanding and wider implementation of CBET. In 1998 only 14,9 % of apprenticeships and traineeships were undertaken within training packages. This proportion increased significantly up to 84,4 % in 2002 (Blythe, 2004, p. 15). Now a Competency-based curriculum characterises the majority of VET, which is why Australia is often considered as the prototype of CBET.

Institutions

The CBET framework in Australia comprises government and industry bodies. The Australian National Training Authority (ANTA) and the Department of Education, Science and Training (DEST) form the two major government institutions. ANTA was established in 1992 and has accomplished several reforms within the last decade. However, ANTA will be abolished by July 2005 and its responsibility will be taken into DEST. The main tasks of ANTA and DEST are to develop a national strategy for VET, to manage and promote national frameworks, to provide national statistical data and to administer programs requiring national delivery. Industry Skills Councils on the other hand are responsible for providing industry intelligence to VET about current and future skill needs and training requirements. Furthermore they support the development, implementation and improvement of training products and services. Industry Skills Councils are currently established for ten industrial areas and it is anticipated that they will expand and gradually replace existing industry advisory bodies. In addition to regulative institutions such as DEST and Industry Skills Councils public and private providers shape the institutional framework and contribute to an "open training market" (Harris, 2001). Learners can either decide to undergo training in a public Technical and Further Education (TAFE) institution or sign a contract with private registered training organisations for on and off-the-job training. The Australian Quality Training Framework sets standards for all registered training organisations to assure consistency and quality of training across Australia.

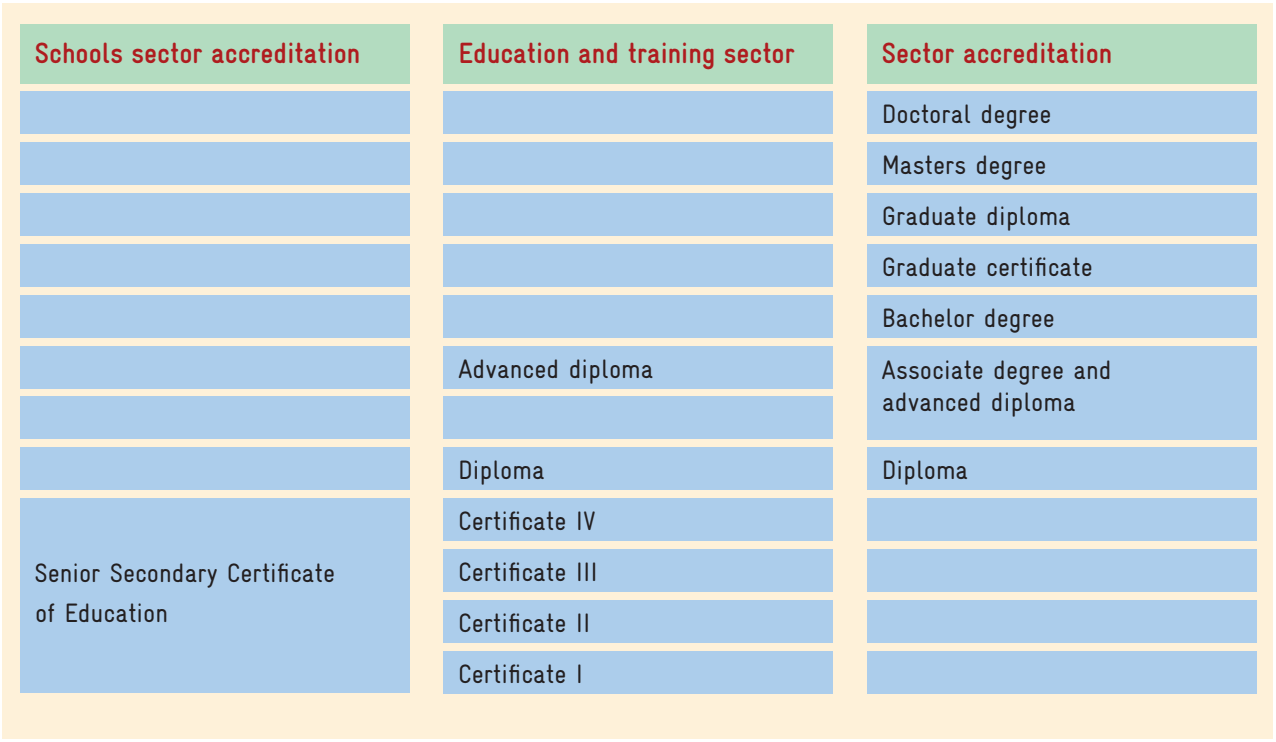
Australian Qualifications Framework

The Australian Qualifications Framework (AQF) was introduced Australia-wide in 1995 in order to provide a

coherent system of work-based and academic qualifications. According to ANTA (2002, p. 29) the Australian Qualifications Framework can be characterised as follows:

- The Australian Qualifications Framework (AQF) is a single, coherent framework for qualifications from Senior Secondary Certificates through to Doctoral Degrees.
- The Framework links together all these qualifications and is a highly visible, quality-assured national system of educational recognition, which promotes lifelong learning and a seamless and diverse education and training system.
- It covers qualifications issued by secondary schools, VET providers and higher education institutions. All qualifications are nationally recognised.
- Within the framework, there are six VET qualifications available: Certificates I, II, III and IV; Diploma and Advanced Diploma.
- "Training packages" specify the combination of competence standards required to achieve a particular qualification. Learners who complete some, but not all, standards for a qualification are awarded a statement of attainment. When they are assessed as competent in the remaining standards, they attain the qualification.

Figure 18: Australian Qualifications Framework



The majority of vocational qualifications are either Certificate III or Certificate IV of the Australian Qualifications Framework. However, almost 25 % of all vocational qualifications are on Diplomas or even Advanced Diplomas, which illustrates that vocational qualifications are not necessarily on the lower levels of the qualifications framework. A statistical overview of vocational qualifications gained from 2001 until 2003 is presented in figure 19.

Figure 19: Vocational qualifications in the Australian Qualifications Framework

	2001 (%)	2002 (%)	2003 (%)
Diploma or Advanced Diploma	23,0	24,7	24,5
Certificate III or IV	48,4	49,6	50,6
Certificate I or II	23,5	21,3	19,3
Other	5,2	4,4	5,1

Source: NCVER, 2004

Training providers

In the 1990s the government aimed at increasing the number of providers, especially among private training organisations and enterprises, by subsidising private registered training organisations. With the policy of a so-called "user choice" (Noble et al., 1999) employers and students shall have a greater choice of VET programs, accompanied by more competition between providers. The resulting "open training market" is meant to enhance both the quality and the quantity of training and to address customer needs more precisely. The various providers of CBET, which can be classified into government or public institutions and private institutions, are listed below:

Government sector

- Technical and further education (TAFE) institutes
- Agricultural colleges
- Some higher education institutions
- Multi-sector providers and campuses
- Secondary schools
- Registered community providers
- Aboriginal education providers
- Private providers under contract to governments

Private sector

- Private providers not in receipt of government funds
- Private business colleges
- Enterprises providing training to their employees
- Suppliers providing training in product use
- Unregistered community providers

Throughout the different training providers mainly three pathways for VET can be identified:

- The first and most formalised pathway is an apprenticeship or traineeship, which integrates on-the-job and off-the-job components in the learning process.
- A special derivative is the concept of "school-based new apprenticeships" (SBNA). This program offers secondary school students in their last two years to either start an apprenticeship or complete a traineeship. Students undergo workplace-based training and take vocational courses in addition to their general studies at high school leading to a "double qualification" (both vocational and general). This requires a strong cooperation between schools, enterprises and TAFE institutes. Although school-based new apprenticeships are considered as being stressful and often related to timetabling problems in schools and enterprises, a sharp increase in the commencements can be asserted. In 1998 about 1,500 students commenced a school-based new apprenticeship, whereas in 2001 the commencements reached 5,755 (Smith/Keating, 2003, p. 114).
- The third way to gain a vocational qualification is through fully on-the-job training, which has also increased with the number of enterprises registering as training providers.

Training packages

Training packages form the new architecture for a Competency-based curriculum. According to ANTA a training package is "a set of nationally endorsed standards and qualifications for recognising and assessing people's skills in a specific industry, industry sector or enterprise". Training packages contain national competence standards in the above-mentioned format. Thus they define skills and knowledge required in a certain workplace within a specific occupational field. Training packages also include a title and details of national qualifications and national assessment guidelines, which define assessment procedures and the required qualifications of assessors. According to the guidelines assessment must be valid, reliable, fair, flexible and in accordance with the standards set in the Australian Quality Training Framework. Furthermore, support material for teachers, trainers and learners is provided and may include learning strategies, professional development materials, assessment materials, learning guides for units and qualifications, teachers' guides and online resources. However, training packages do not describe how a learner should be trained. Thus, flexibility is provided for teachers and trainers to develop learning strategies and apply them in accordance with the learners' needs, abilities and circumstances.

Training packages are developed by Industry Skills Councils, however enterprises are eligible to define their own training packages according to their specific needs. These training packages are assessed and endorsed by the National Training Quality Council to assure consistency and quality of the contents. Within a period of three years training packages are reviewed. The review process is divided into two phases, whereas in the first phase research is undertaken by acknowledged researchers of national institutes and universities who publish analysis and recommendations. After the research phase of six months current training packages are modified and others are defined for new areas.

Currently, 81 industry training packages are endorsed and nine training packages have been developed by enterprises to address their specific needs (Blythe, 2004, p. 6). Industry training packages provide a coherent curricular framework for training, which allows for portability of qualifications and flexible "packaging" of units of competence. Furthermore learners and trainers can design delivery and assessment individually.

Concerns about the variance in the quality of training have been picked up by implementing quality assurance through supervisory bodies with advanced skills in the respective branch or industry. Another issue that is often raised refers to the primary focus on assessment rather than learning processes and the neglecting of underpinning knowledge. Teachers also criticise the lack of information concerning didactical and methodical guidance in the learning process. On the other hand, practitioners from industries regard the focus on industry standards and the acknowledgement of industry and workplace requirements as supportive and functional in terms of integrating technological changes with training packages. Protagonists also claim that training packages lead to national accredited qualifications, which produce transparency and increased mobility for students and employees.

The increasing training package enrolments indicate that the acceptance of training packages has become wider. It is anticipated that the importance of training packages will increase due to new developments and current reviews. Another aspect illustrating the growing importance of training packages is the distribution of qualifications gained within the AQF which shows that training packages provide qualifications even on the upper levels of the framework:

Figure 20: Training package qualifications (2002)

AQF level I		AQF level II		AQF level III		AQF level IV		AQF diploma or higher	
('000)	%	('000)	%	('000)	%	('000)	%	('000)	%
49,6	5,9	244,0	29,1	324,1	38,7	134,7	16,1	85,6	10,2

Source: NCVER, 2004

4.2 England, Wales and Northern Ireland

In England and Wales the National Council for Vocational Qualifications (NCVQ) was established in October 1986 following the publication of the White Paper "Working Together – Education and Training". An independent body, NCVQ had the role of establishing a National Vocational Qualification (NVQ) framework based on occupational standards and linked to emerging vocational markets in the European Community. These Competency-based qualifications were designed for people in work and offered as an independent but parallel education and training "track" to complement academic qualifications (Canning, 2001, p. 165).

As early as 1981, the Manpower Services Commission (MSC) had addressed the need of a Competency-based approach to VET in the UK in the New Training Initiative. Attempts to cope with the skills shortages in the British economy which followed comprised the introduction of the Youth Training Scheme (YTS) and the Technical and Vocational Education Initiative (TVEI). Both programs aimed at the reduction of the high rate of youth unemployment by providing access to a basic vocational training program which was meant to lead into employment. The introduction of NVQs in 1993 and their integration within a National Qualifications Framework (NQF) in 1999 completed the institutional corset of a new standards-based, competitive and outcomeled VET system. NVQs are based on standards of work-related competences and therefore provide formal consistency of vocational qualifications throughout England, Wales and Northern Ireland. NVQs quite ideally represent the central premises of CBET, as the system trusts in a new definition of competence rather than in occupational traditions (Wolf, 1998, p. 210):

- "As national qualifications, NVQs each cover a particular area of work, at a specific level of achievement. They are based on the fundamental assumption that, for each industry, there exists a single identifiable model of what 'competent' performance entails. The idea that, for each role, there exists such an agreed notion of competence, which can be elicited and command consensus, is fundamental to any assessment system of this type."

Quite clearly, this notion of competence alludes to functions rather than holistic sets of competences based on vocational knowledge (Wolf, 1998, p. 208):

- "NVQs were to be based on a 'functional analysis' of what occupational roles implied, from which would be derived detailed but national specifications of occupational competence. Direct assessment of someone's competence – not their book knowledge, and not their time on the job – would be the defining requirement for award of an NVQ."

Institutions

The institutional framework is characterised by a range of industry sector bodies that define and update competence standards for respective occupations (see figure 21). Awarding bodies on the other hand design assessment and quality assurance systems in accordance with industry bodies. Competence standards and assessment procedures therefore are supposed to be in line with each other. Awarding bodies approve and monitor regional assessment centres which conduct assessment according to defined criteria. The central overarching government institution within the CBET system is the Qualifications and Curriculum Authority (QCA), which supervises both sector and awarding bodies and decides on proposals for qualifications, competence standards and assessment.

Figure 21: Institutions responsible for qualifications in England and Wales

National qualifications framework

A national framework for vocational and academic qualifications was developed in 1986 by the National Council for Vocational Qualifications (NCVQ) to be endorsed in England, Wales and Northern Ireland. The framework originally contained three forms of available qualifications, namely National Vocational Qualifications (NVQs), General National Vocational Qualifications (GNVQs) and general (school and academic) qualifications. GNVQs aimed at bridging the gap between vocational and academic qualifications by offering vocationally related general learning units. However, GNVQs have never really become rooted and accepted within the education system, which resulted in the recent political move to abolish them within the next few years.

The original framework comprised five levels on which qualifications could be awarded. In 2004, the framework underwent revision which resulted in a nine level framework systematising the totality of vocational and academic qualifications. The entry level as well as level one to three of the original framework have remained

unchanged, i.e. NVQs and the respective general qualifications (secondary school qualifications and A levels) are still on level one to three. NVQs level four and five are not included in the new framework, since the upper levels only are now made up of academic qualifications and vocational diplomas. The framework is illustrated in figure 22:

Figure 22: National qualifications framework

<table>
<tr><th colspan="2">National qualifications framework</th><th rowspan="2">Framework for higher education qualification levels (FHEQ)</th></tr>
<tr><th>Original levels</th><th>Revised levels</th></tr>
<tr><td rowspan="2">5
Level 5 NVQ in Construction Project Management
Level 5 Diploma in Translation</td><td>8 Specialist awards</td><td>D (doctoral) doctorates</td></tr>
<tr><td>7 Level 7 Diploma in Translation</td><td>M (masters) masters degrees, postgraduate certificates and diplomas</td></tr>
<tr><td rowspan="3">4
Level 4 NVQ in Advice and Guidance
Level 4 Diploma in Management
Level 4 BTEC Higher National Diploma in 3D Design
Level 4 Certificate in Early Years Practice</td><td>6 Level 6 Diploma in Management</td><td>H (honours) bachelors degrees, graduate certificates and diplomas</td></tr>
<tr><td>5 Level 5 BTEC Higher National Diploma in 3D Design</td><td>I (intermediate) diplomas of higher education and further education, foundation degrees, higher national diplomas</td></tr>
<tr><td>4 Level 4 Certificate in Early Years Practice</td><td>C (certificate) certificates of higher education</td></tr>
<tr><td colspan="2">3
(There is no change to level 3 in the revised NQF)
Level 3 Certificate in Small Animal Care
Level 3 NVQ in Aeronautical Engineering
A levels</td><td rowspan="4"></td></tr>
<tr><td colspan="2">2
(There is no change to level 2 in the revised NQF)
Level 2 Diploma for Beauty Specialists
Level 2 NVQ in Agricultural Crop Production
GCSEs Grades A*–C</td></tr>
<tr><td colspan="2">1
(There is no change to level 1 in the revised NQF)
Level 1 Certificate in Motor Vehicle Studies
Level 1 NVQ in Bakery
GCSEs Grades D–G</td></tr>
<tr><td colspan="2">Entry
(There is no change to entry level in the revised NQF)
Entry Level Certificate in Adult Literacy</td></tr>
</table>

Source: QCA, 2004

The English National Qualifications Framework is not only a formal tool to describe and locate qualifications, but also a means to promote access, motivation and achievements in education and training. According to QCA its function is to promote lifelong learning by helping people to understand progression routes and to avoid duplication and overlap of qualifications, while assuring that all learning needs are covered. Furthermore, the framework fosters public and professional confidence in the integrity and relevance of national qualifications (QCA, 2004).

QCA has also set up level indicators for all types of competence profiles and qualifications within the NQF (see figure 23). They comprise names of qualifications and related work activities for the respective competence level. These indicators are not intended to be precise or comprehensive, they rather function as guides for individual learners, parents, teachers/tutors/trainers, career advisers and employers.

Figure 23: Level indicators

Framework level	Level indicators	
Entry	Entry level qualifications recognise basic knowledge and skills and the ability to apply learning in everyday situations under direct guidance or supervision. Learning at this level involves building basic knowledge and skills and is not geared towards specific occupations.	Qualifications are offered at Entry 1, Entry 2 and Entry 3, in a range of subjects
Level 1	Level 1 qualifications recognise basic knowledge and skills and the ability to apply learning with guidance or supervision. Learning at this level is about activities which mostly relate to everyday situations and may be linked to job competence.	NVQ 1; Certificate in Plastering; GCSEs Grades D – G; Certificate in Motor Vehicle Studies
Level 2	Level 2 qualifications recognise the ability to gain a good knowledge and understanding of a subject area of work or study, and to perform varied tasks with some guidance or supervision. Learning at this level involves building knowledge and/or skills in relation to an area of work or a subject area and is appropriate for many job roles.	NVQ 2; GCSEs Grades A* – C; Certificate in Coaching Football; Diploma for Beauty Specialists
Level 3	Level 3 qualifications recognise the ability to gain, and where relevant apply a range of knowledge, skills and understanding. Learning at this level involves obtaining detailed knowledge and skills. It is appropriate for people wishing to go to university, people working independently, or in some areas supervising and training others in their field of work.	Certificate for Teaching Assistants; NVQ 3; A levels; Advanced Extension Awards; Certificate in Small Animal Care

Framework level	Level indicators	Examples of qualifications
Level 4	Level 4 qualifications recognise specialist learning and involve detailed analysis of a high level of information and knowledge in an area of work or study. Learning at this level is appropriate for people working in technical and professional jobs, and/or managing and developing others. Level 4 qualifications are at a level equivalent to Certificates of Higher Education.	Diploma in Sport & Recreation; Certificate in Site Management; Certificate in Early Years Practice
Level 5	Level 5 qualifications recognise the ability to increase the depth of knowledge and understanding of an area of work or study to enable the formulation of solutions and responses to complex problems and situations. Learning at this level involves the demonstration of high levels of knowledge, a high level of work expertise in job roles and competence in managing and training others. Qualifications at this level are appropriate for people working as higher grade technicians, professionals or managers. Level 5 qualifications are at a level equivalent to intermediate Higher Education qualifications such as Diplomas of Higher Education, Foundation and other degrees that do not typically provide access to postgraduate programmes.	Diploma in Construction; Certificate in Performing Arts
Level 6	Level 6 qualifications recognise a specialist high level knowledge of an area of work or study to enable the use of an individual's own ideas and research in response to complex problems and situations. Learning at this level involves the achievement of a high level of professional knowledge and is appropriate for people working as knowledge-based professionals or in professional management positions. Level 6 qualifications are at a level equivalent to Bachelors degrees with honours, graduate certificates and graduate diplomas.	Certificate or Diploma in Management
Level 7	Level 7 qualifications recognise highly developed and complex levels of knowledge which enable the development of in-depth and original responses to complicated and unpredictable problems and situations. Learning at this level involves the demonstration of high level specialist professional knowledge and is appropriate for senior professionals and managers. Level 7 qualifications are at a level equivalent to Masters degrees, postgraduate certificates and postgraduate diplomas.	Diploma in Translation; Fellowship in Music Literacy
Level 8	Level 8 qualifications recognise leading experts or practitioners in a particular field. Learning at this level involves the development of new and creative approaches that extend or redefine existing knowledge or professional practice.	Specialist awards

Source: QCA, 2004

4.3 Scotland

In 1989 the political decision was taken to extend the development of the NVQ framework to Scotland, and to give SCOTVEC (the Scottish Vocational Education Council) the sole responsibility as and accrediting and awarding body for what would become to be known as SVQs (Scottish Vocational Qualifications). In practice the structure was the same as NVQs, confirming the prominence of English policy making in this field (Canning, 2001, p. 165). The development of SVQs marked the first attempt in Scotland to introduce a national work-based qualification framework. The CBET system introduced in the 1980s was to achieve more industry relevance in the VET system. Some 150 industry lead bodies were established in 1987 to set up criteria for vocational qualifications by linking them to competence standards (Harris et al., 1995, p. 44). Furthermore, with the introduction of CBET, VET policy was intent to secure access to different forms of training and vocational qualifications, clearly encouraging individuals to progress to further training and lifelong learning. The expansion of the VET system during this period was given additional impetus in 1990 by the creation of a devolved enterprise network that was meant to link more closely the economic expansion of the nation with the education and skills of its workforce (Fairley, 1996).

Institutions

The Scottish Vocational Education Council (SCOTVEC) used to be the executive authority for VET and contributed largely to the development of a Competency-based system. However, in 1997 SCOTVEC was abolished and its responsibilities were transferred to the Scottish Qualifications Authority (SQA), which is now the main institution for accrediting proposals for vocational qualifications as well as supervising industry lead bodies and awarding bodies. Furthermore, the SQA approves institutions engaged in the delivery and assessment of national qualifications, i.e. public providers, such as further education colleges, and public sector employers as well as private providers, such as private sector training companies and private employers (Osbourne/ Turner, 2002, pp. 276). SQA is the Scottish counterpart to the QCA in England and the resulting institutional structures, with industry bodies in charge of defining competence standards for national vocational qualifications on the one hand, and awarding bodies in charge of assessment and certification on the other, are identical with the structures described above.

The Scottish Credit and Qualifications Framework (SCQF) The Scottish Credit and Qualifications Framework (SCQF) was introduced in 2001 and encompasses twelve levels for general, vocational and higher qualifications (see figure 24). The framework aims at providing more transparency of qualifications and the relationships between them (Raffe, 2003, p. 239). The SCQF is supposed to help learners seeking for further training or education opportunities to understand the different types of available qualifications and their potential benefit for the individual. The SCQF also functions as a facilitating tool with respect to the access to education and training in general and the promotion of lifelong learning.

Figure 24: Scottish Credit and Qualifications Framework

	SQA National Units, courses and group awards	Higher education	Scottish vocational qualifications
12		Doctorates	
11		Master's	SVQ 5
10		Honours degree Graduate Diploma/Certificate	
9		Ordinary degree Graduate Diploma/Certificate	
8		Higher National Diploma Diploma in Higher Education	SVQ 4
7	Advanced Higher	Higher National Certificate Certificate in Higher Education	
6	Higher		SVQ 3
5	Intermediate 2 Credit Standard Grade		SVQ 2
4	Intermediate 1 General Standard Grade		SVQ 1
3	Access 3 Foundation Standard Grade		
2	Access 2		
1	Access 1		

Source: SCQF, 2003, p. 3

As indicated in the SCQF Scottish vocational qualifications are defined on five levels (4, 5, 6, 8 and 11), which are specified in terms of occupational standards (Harris et al., 1995, p. 44). Level 1 is equivalent to a foundation level, level 2 complies with a basic craft level, level 3 with a technician, advanced craft and supervisor level, level 4 with higher technician and junior management and level 5 equals a professional level.

5 CBET versus vocationalism

5.1 Germany's apprenticeship culture

Vocational training systems are determined by a specific "philosophy" or "intrinsic logic" which gives them the character of "black boxes" as they have to be understood "in relation to other societal institutions" including the labour market, the economy, the system of industrial relations and of course the system of government (Raffe, 1998, p. 391). Although in Anglophone countries, such as the UK or Australia, apprenticeships have been revitalised or reframed in recent years (Modern Apprenticeships in the UK or New Apprenticeships in Australia) due to dissatisfaction with both school-based skill formation as well as traditional on-the-job training (Ryan, 2001; Canning, 2001; Harris/Deissinger, 2003) they have remained less strongly regulated than, e.g., the German apprenticeship system, called the "Dual System" – which certainly represents a very specific "training culture" (Deissinger, 2004a).

Despite a number of "modern" intentions backing or promoting apprenticeships, societies cannot ignore the "historical character" of their respective vocational training systems. This implies that there is a cultural foundation for the general significance given both to apprenticeship as an institutional solution towards the problem of skill formation as well as to the interaction or even interdependence between the apprenticeship system and the systems of general and higher education respectively (Deissinger, 2000). In Germany, it is an apparent phenomenon that the understanding of a separate vocational pathway as "unique" and valuable in itself is a trait which sets the country apart from most other European societies (with the exception of Austria and Switzerland). This unique positioning, however, has traditionally provoked criticism with respect to the organisation of vocational training and general education "according to separate criteria and systems of assessment" including "limited possibilities for progression between them" (Young, 2003, p. 228). On the other hand, it may be argued that academic and (nonacademic) vocational pathways, in the German case, are well rooted within disjunct but interdependent subsystems and that their mutual interaction obviously contributes to stabilizing the "vocational track" in a stronger way than in other countries. Despite serious problems related to the training market (Deissinger/Hellwig, 2004) there are no signs that the German apprenticeship system representing this strong belief in the importance of vocational qualifications has entered a stage of degradation.

If one looks at the respective apprenticeship cultures in the UK and Germany both represent an "updated past" as they follow the principles of vocational training emerging from the time of the Industrial Revolution (Deissinger, 1994; 2004b). However, whereas in Germany the state emerged as the leading force in promoting vocational training, in the UK, due to the successes of industrialisation achieved without significant contributions from the educational system, there was a strong belief that "preparation for production was best given on the job rather than in formal education" (Child et al., 1983, p. 73). The general aversion from state intervention and the reluctance on the government's side to become involved with matters linked to skill formation in particular also stifled efforts to institutionalise the day continuation school on a compulsory basis. In Germany, due to a decidedly corporatist approach to vocational training and to the successful pedagogical justification of the necessity to offer compulsory part-time education to apprentices and young workers, industrial training became based on the traditional notion of Beruf or vocation. This probably explains the major difference between Germany and the UK (Deissinger, 2002) since it touches the cultural as well as the pedagogical dimension of vocational training.

Although the combination of learning and work (part-time vocational school and training company) is normally considered to be the quintessential facet of the "German system" of vocational training (Greinert, 1994), its working principles are more complex. Its crucial 'philosophy' is vocationalism which means that training is workplaceled and predominantly practical by stressing the importance of work experience during the training period. It encompasses a 'holistic' set of competences defined "around the workplace" and based on national qualification standards according to the Vocational Training Act or Berufsbildungsgesetz (Deissinger, 1996; Raggatt, 1988). In terms of its 'macro-structure' the Dual System therefore is also determined by an active role of the state that secures occupational

standards and conditions of skilled apprenticeship. Unlike in other countries with apprenticeships as part of their training systems the law stipulates what makes out an apprenticeship (Ryan, 2001, p. 133).

Against this background the German "training culture" (Brown/Evans 1994) is based on the notion that vocational training should not only be a specific form of employment but quite manifestly an educational issue. Therefore the federal state education acts prescribe that it is mandatory for school-leavers under the age of eighteen not in higher or further education to attend the local part-time vocational school on a sandwich or day-release basis (making the system a 'dual' system).

The most interesting aspect about Germany's Dual System, however, certainly is the fact that, on the company side, the state's function is restricted to securing quality standards in a predominantly formal manner. Besides state institutions, reliable participation of firms is one of the key requirements for the working of vocational training on the side of companies. It may be argued that the training market in Germany "has the character of a suppliers' market" (Greinert, 1994, p. 80; NCVER, 2001, p. 38) as apprenticeships are offered and funded by companies themselves on a voluntary basis.

However, the importance of enterprise responsibility is not supposed to lead to over-specialised training since priority is given towards "broad-based knowledge and the acquisition of basic techniques" (Géhin/Méhaut 1995, p. 65). For this purpose, the administrative and organisational contribution of the chambers appears to be indispensable. The Vocational Training Act places vocational training in the hands of firms and chambers and thus emphasises the principle of self-government. The "competent authorities" – as the chambers are named by the law – are to monitor in-company training, support training companies and hold exams for journeymen, skilled industrial workers, commercial clerks and masters.
The German "training culture" is therefore determined by the following traits:

- Vocationalism linked to the notion of Beruf
- Formal state quality control
- Dualism of learning sites
- Compulsory attendance at the vocational part-time school
- Commitment and involvement of chambers and companies

5.2 Difference between vocationalism and CBET

In its White Paper published in 1993 (European Commission, 1993) the European Commission pointed out that Lifelong Learning should become "the overall objective to which the national educational communities can make their own contributions". Two years later, in the well-known White Paper on Teaching and Training – Towards the Learning Society (European Commission, 1995) the concept of Lifelong Learning became associated with the idea of a "personal skills card" to enable every European citizen to acquire and document new knowledge and skills both in the various formal and informal learning environments. Against this background, the strong cultural focus on apprenticeships in Germany carries some obvious ambivalence which is at least indirectly linked to the vocational principle:

- On the one hand, apprenticeship qualifications represent entry-level qualifications which help people to become competent for a given occupation. Strictly speaking, this implies that these skills should last for the whole working life.
- On the other hand, apprenticeship qualifications

are the basis of all further training activities, both informal company-based training and training given in formal learning environments (e.g. master craftsman or technician courses). This implies that skills development normally sets in at a comparatively high level.

Against this background, the German meaning and understanding of the vocational principle as realised in the dual apprenticeship system refers to a specific quality of didactical as well as institutional arrangements.

- Each occupation has to be integrally structured and relatively job-independent. Both the branch and the individual value of the qualification obtained at the end of the training process represent "special qualities" both in relation to other occupations and to qualifications in higher education. Training occupations function as the starting point as well as the target of the training process and are based on what may be called an "organisational picture" which is standardised by state statutes and thus significantly removed from the specific character of individual workplaces.

- The quantity and quality of skills and knowledge to be imparted in the training process are supervised and validated through intermediate and final examinations as well as certified in a way acceptable to the labour market. Apprenticeships hence are closely associated with the notion of homogeneous training courses based on standardised training ordinances.

The importance of entry-level qualifications is less important in Anglo-Saxon countries (Ryan, 2001; Harris/ Deissinger, 2003). Therefore the UK or Australian VET systems seem much more prepared to offer training opportunities in the context of lifelong learning. The most striking feature of certification frameworks associated with CBET is the definition of outcomes and not that of specified courses (Stead-man, 1995). The principle of modularisation gives employers and employees the opportunity to define training needs flexibly and individually and opt for the achievement of competences on various levels. Supporters of the system (Jessup, 1991) point to its function to promote job-ready skills and its general flexibility potential. On the other hand, critics utter concern that the system is too bureaucratic, the knowledge factor within the modules is rather underrepresented and that take-up among employers is far from satisfactory. Apart from its industry-led nature and its pedagogical deficiencies (e.g. Raggatt & Williams, 1999) it is obvious that – in particular from a didactical point of view – the principles that determine, e.g., the NVQ system and the inherent meaning of competence differ sharply from the German "vocational principle":

Qualifications and underlying competences are divided into units (modules) or even elements. In contrast, even "stage training" in the German Dual System is an apprenticeship and is based on the assumption that the qualification at each level should be uniform and market-able by representing an occupational standard, not just a bundle of specific competences.

In CBET systems the focus is on learning results that are "independent of the site, the form of provision and the type of pedagogy and curriculum" (Young, 2003, p. 225). In consequence, quality control during the training process is virtually absent and there is no formal examination procedure beyond assessment in the workplace.

Although there is now generally a higher degree of formalisation (and certainly more bureaucracy) within many qualification and certification frameworks in "CBET countries" the didactical understanding which determines the processes of skill formation in the area of company-based initial training differs hugely from the traditional apprenticeship model. The contrasting "character" between an "open", flexible system such as the UK system and the German system, with its specific focus on the "vocational principle", is adequately reflected in a statement which refers to the introduction of "Modern Apprenticeships" in England in the 1990s (Ryan, 2001, p. 136 f.):

"A striking difference from Germany is the absence of minimum training periods, such as a three-year programme for bakers. Similarly, apprentices need not take part-time technical education, unless they are

MA participants functioning under an NTO framework that requires it – and even then no general education is required. Indeed, "off-the-job" training in a company training centre or with an external commercial provider is often enough to meet NTO requirements, despite concerns about its quality and relevance".

The following table summarises the differences between the two "cultures":

Competency-based training	Occupation-based training
National qualifications	Recognised training occupations
National qualification standards or training packages	Training ordinances and syllabuses
Profiles can be shaped by individuals	Individuals have to complete whole course and can only go for standardised profiles
Importance of outcomes	Importance of inputs (institutions, processes)
Modular structure	Holistic structure
Certification of individual modules	Certification of whole occupation
Wide range of accreditation of prior learning or informal learning	Few regulations of accreditation of prior (formal) learning or occupational experience

6 Conclusion

Implementation of CBET requires effort from different actors in the VET system. Concerns are articulated from different perspectives, mainly from vocational teachers and employers. According to a study by Misko (1999), teachers felt not well enough informed and prepared for methodical and didactical innovations associated with CBET. Shifting from learning processes to outcomes often means that educational aspects, including underpinning knowledge and understanding, are disregarded in favour of economic objectives. The clear outcome orientation is also often associated with a decline in training quality.

"Assessment on demand" as suggested in CBET is considered to be time-consuming and complex and is therefore often not conducted in the prescribed way. Another critical aspect which is articulated is the behaviouristic tenor underlying CBET (Hyland, 1995) which stands for a narrow task-orientation, held responsible for the separation of doing and thinking (Hager, 2004).

Against the background of these reservations and critical statements, recent approaches pursue a wider concept of competence, although still far away – even in the area of apprenticeships – from the holistic German vocational tradition. This means that generic skills and underpinning knowledge are increasingly considered in the development of competence standards.

Another more general issue held against the implementation of CBET is the lack of social acceptance. CBET is often regarded as being only appropriate for low-skilled workers and trades but not for professions. This is due to the fact that there has never been an approach to implement CBET in higher education. Therefore, it seems that CBET tends to increase the dichotomy between vocational and higher education rather than to bridge the two systems by providing more permeability and transition routes. Although this separation is also existent in the German system, the value of the "vocational track" is much higher. If the two "philosophies" will ever meet is an open issue.

Glossary

Apprenticeship
A system of training regulated by law or custom which combines on-the-job training and work experience while in paid employment with formal off-the-job training. The apprentice enters into a contract of training or training agreement with an employer who imposes mutual obligations on both parties.

Assessment criteria
Statements which describe performances and place them in context with sufficient precision to allow valid and reliable assessment.

Awarding body
An organisation recognised by the regulatory authorities for the purpose of awarding accredited qualifications.

Best practice
Management practices and work processes that lead to outstanding or top-class performance and provide examples for others.

Competence standard
An industry-determined specification of performance which sets out the skills, knowledge and attitudes required to operate effectively in employment. Competence standards are made up of units of competence, which are themselves made up of elements of competence, together with performance criteria, a range of variables, and an evidence guide.

Competency-based assessment (or CBA)
The gathering and judging of evidence in order to decide whether a person has achieved a standard of competence.

Credential
Formal certification issued for successful achievement of a defined set of outcomes, e.g. successful completion of a course in recognition of having achieved particular knowledge, skills or competences; successful completion of an apprenticeship or traineeship.

Curriculum
The specifications for a course or subject (module) which describe all the learning experiences a student undergoes, generally including objectives, content, intended learning outcomes, teaching methodology, recommended or prescribed assessment tasks, assessment exemplars, etc.

Evidence guide
The part of a competence standard which provides a guide to the interpretation and assessment of the unit of competence, including the aspects which need to be emphasised in assessment, relationships to other units, and the required evidence of competence.

Flexible delivery
A range of approaches to providing education and training, giving learners greater choice of when, where and how they learn. Flexible delivery may involve distance education, mixed-mode delivery, online education, self-paced learning, self-directed learning, etc.

Formal education
Also formal training education or training provided in educational institutions such as schools, universities, colleges, etc. or off the job in a workplace, usually involving direction from a teacher or instructor.

Informal education
The acquisition of knowledge and skills through experience, reading, social contact, etc.

Key competences
Any of several generic skills or competences considered essential for people to participate effectively in the workforce. Key competences apply to work generally, rather than being specific to work in a particular occupation or industry. The Finn Report (1991) identified six key areas of competence which were subsequently developed by the Mayer committee (1992) into seven key competences: collecting, analysing and organising information; communicating ideas and information; planning and organising activities; working with others and in teams; using mathematical ideas and techniques; solving problems; and using technology.

Performance criteria
The part of a competence standard specifying the required level of performance in terms of a set of outcomes which need to be achieved in order to be deemed competent.

Quality assurance
The systems and procedures designed and implemented by an organisation to ensure that its products and services are of a consistent standard and are being continuously improved.

Recognition of prior learning (or RPL)
The acknowledgement of a person's skills and knowledge acquired through previous training, work or life experience, which may be used to grant status or credit in a subject or module.

Regulatory authority
An organisation designated by government to establish national standards for qualifications and to secure compliance with them.

Traineeship
A system of vocational training combining off-the-job training at an approved training provider with on-the-job training and practical work experience. Traineeships generally take one to two years and are now a part of the New Apprenticeships system.

Unit of competence
A component of a competence standard. A unit of competence is a statement of a key function or role in a particular job or occupation. See also element of competence, performance criteria, range of variables.

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List of figures

List of abbreviations

ANTA	Australian National Training Authority
APL	Accreditation of Prior Learning
AQF	Australian Qualifications Framework
AQTF	Australian Quality Training Framework
CBA	Competency-based Assessment
CBET	Competency-based Education and Training
DACUM	Develop a Curriculum
DEST	Department for Education, Science and Training
FE	Further Education
FHEQ	Framework for Higher Education Qualifications
GNVQ	General National Vocational Qualification
ITAB	Industry Training Advisory Body
LSC	Learning and Skills Council
MSC	Manpower Service Commission
NCVER	National Centre for Vocational Education Research
NQF	National Qualifications Framework
NTO	National Training Organisation
NVQ	National Vocational Qualification
QCA	Qualifications and Curriculum Authority
RPL	Recognition of Prior Learning
SCOTVEC	Scottish Vocational Education Council
SCQF	Scottish Credit and Qualifications Framework
SQA	Scottish Qualifications Authority
SSC	Sector Skills Council
TAFE	Technical and Further Education
TVEI	Technical and Vocational Education Initiative
VET	Vocational Education and Training

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14	Structures et fonctions de l'éducation et de la formation basées sur la compétence (CBET): une perspective comparative	French
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