The Manual for Development of

National Competency Standards and Competency Based Training Curricula

Tertiary and Vocational Education Commission

Ministry of Education

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Preface

The need for a competent workforce is paramount important for both the prosperity of individuals and also for the economic growth of the country. The NVQ Framework has been developed to meet these ever-evolving skills needs and it needs updating of NCSs and curricula in line with the advancement of the technology and skills in the local and global industry.

The process of development of NCS is a multi-faceted endeavor, requiring input from industry leaders, trainers, labour officers, trade unions, and resources on the world-wide web. The resulting standards are the foundation upon which training and assessment programmes are effectively built to ensure that individuals are equipped with the skills and knowledge necessary for meaningful employment and career advancement.

The development of curricula to instill competencies specified in NCS among trainees is equally critical. Curricula act as the roadmap that guides trainers, students, and on-the-job training providers in the pursuit of excellence. They must remain agile, adaptable, and responsive to the ever-changing dynamics of the labor market. In this manual, we provide insights and guidance on curricula development and assessment, aiming to bridge the gap between theory and practice and to create a seamless transition from education to employment.

I appreciate the collaborative approach followed in the development of this manual where TVEC, NAITA, UOVT, and external experts and the consultant had lively dialogues especially on new and innovative features introduced in this manual. While guiding developers, this manual should educate all stakeholders of NCS to enable them to have constructive communication with the developers.

I extend my gratitude to the consultant, external experts, TVEC, NAITA, and UoVT officials who contributed to successful completion of this manual, and we look forward to a future where competency standards and curricula development serves as pillars of a robust, adaptable, and inclusive National Vocational Qualification system in the country.

Dr.K. A. Lalithadheera

Director General

Abstract

National Competency Standards, CBT curricula, and assessment material are three main pillars of the NVQ Framework. Therefore, the development and implementation of those three documents should have well-refined development processes.

In the inception of the NVQ framework in 2005, only NAITA and UOVT developed NCSs and curricula. As demand for new NCSs have been increasing exponentially, it has become necessary for the TVEC to obtain the services of other agencies to develop NCSs and curricula in time. This manual is a TVEC initiative to maintain uniformity among NCS and curricula developed by multiple developers.

As NAITA and UOVT have been developing NCS and curricula for the last 20 years, the development processes and procedures are well established. However, still, there are areas that need improvement and further refinement. Therefore, innovation is an essential aspect of these development processes to be in par with ever changing technology and industry practices.

Development of NCSs and curricula are done to address the skill needs of the industries and labour market. Therefore, the identification of occupations and industry sectors for the development of NCSs and curricula is an important activity. This manual has listed all the aspects to be considered for the identification of occupations and industry sectors and issues to be avoided are explained in Annexure 07 (Box A1). In order to identify the competencies practiced under an occupation, two standard processes i.e functional analyses and DACUM approach are well explained and it further explains occupational analysis through surveys of literature and workplaces. It is expected that developers will further explore to select low-cost and effective models for occupational analysis. This has proposed to consider knowledge, digital, and green economy requirements in occupational analyses and emphasized the minimization of waste. Though NVQ Frameworks has 7 qualification levels, most NCSs have not developed level 1 and 2 qualifications. Level 1 & 2 qualifications are a reality in occupations handled by teams of different skill levels and this manual has explained how competencies of level 1 & 2 qualifications could be identified in occupational analyses.

Each competency unit has an NVQ level decided based on expert judgement on three factors; Process complexity, learning demand, and responsibility. Guiding factors to be considered for judgments of levels are listed. NVQ Level 1 -4 qualifications are developed by packaging competency units relevant to a job in workplaces . Workplace realities relevant to jobs of different levels are explained.

NVQ Level 5 & 6 qualifications are credit-based qualifications with 20 and 30 NVQ level 1 -4 credits (1 credit = 25 notional learning hours) respectively. How those NVQ level 1 – 4 credits could be chosen to provide a broader foundation for diplomats are outlined.

Under the CBT curricula, processes of development of Curriculum outline, learner guide and trainer guide are elaborated. The format of module has been formulated integrating both NVQ level 1 – 4 and NVQ Level 5 & 6 curricula formats. All sub-titles of the Modules are described and all learning should be indicated with relevant competency elements to facilitate continuous assessments where steps of writing learning outcomes and learning content are listed and how action verbs are chosen using Bloom's Taxonomy is explained. Further, how learning time could be decided and how it could be adjusted to different learning modes is briefly described.

As the modules have indicated the relevant competency units and elements, it is not difficult to identify modules relevant to a qualification. However, for the convenience of trainers and learners, a table to map qualifications with competency units has been added. Occupational outlook is useful for potential trainees to understand the prospect of occupation and it provides justification for the need for a new NCS. Factors to be considered for the development of occupational outlook are listed taking guidance from the Occupational Outlook Manual published by the US Bureau of Labour Statistics.

The Learners' Guide provides performance guides for each element and with reflective questions. The Trainer's Guide is included with course accreditation, continuous assessment, preparation of Level 5 & 6 laboratory sheets, and preparation of reports on industry visits as a practicum. It further explains how extra-curricular activities could be used as structured learning to inculcate soft-skills among trainees. It emphasizes the preparation of trainees for on-the-job training and final assessments. The assessment guide while explaining current procedures practiced at present introduces a new feature on holistic assessment as an effective and time-saving assessment method.

NVQ Framework, NCSs, CBT curricula, and assessments are linked to industries with fast dynamism. Therefore, the NVQ Framework and its sub-systems need continuous improvement while this manual also needs periodical updating and improvements.

Acknowledgements

It is our pleasure to express our sincere gratitude to all those who get involved in development of this Manual for Development of NCS and CBT Curricula and acknowledge their efforts for successful completion of the Manual. As per the Annual Implementation Plan of the TVEC, the work was initiated by Dr. Ajith Polwatte, Director (NVQ) as a priority activity of year 2023. Obviously, a common guideline which explains the general policy, procedure and practices in developing NCS and CBT curricula was a necessity given the fact that a multitude of agencies undertake development of NCS and curricula in specific industry sectors. Therefore, he deserves an appreciation for a national endevour initiated and successfully completed in timely manner.

Mr. B. H. S. Suraweera, Chartered Engineer and former Deputy Director General of TVEC, TVET Reforms Specialist of SSDP project was the Consultant of the development of the Manual whose knowledge and vast experience in TVET unconditionally provided to the development of the Manual.

The NAITA, and the UOVT were the lead bodies developing NCS and curricula in NVQ Level 1 – 6 conventionally. These two bodies have a wealth of experience in this task which was harnessed during the development of the Manual. Dr. D. D. D. Suraweera, Senior Lecturer, Mr. Suraj Jayathilake, Senior Lecturer, Mr. Indika Pushpakumara, Program Officer in charge of NCS development were get involved and they contributed in this task. From the NAITA, Mr. Channa Subasinghe, Director (Quality), Ms. Theja Malkanthi, Assistant Director, Ms. Hasini Kaushika, Inspector was very helpful and provided their views and comments in this task.

Mr. P. N. K. Dias, former Director of the NAITA who currently works as a process expert of NCS development was also very helpful and he shared his vast experiences in the development of the Manual.

TVEC staff including all the Directors, Deputy Directors and Assistant Directors of the NVQ division contributed immensely in successful completion of the Manual.

For and on behalf of the TVEC, we graciously acknowledge all the contributions extended by all the parties mentioned above for this national endevour.

Dr. K. A. Lalithadheera

Director General

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Deputy Director General

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Abbreviations and Acronyms

CBT	Competency-Based Training
DACUM	The acronym for the 'Development of a Curriculum'
ICT	Information and Communication Technology
LMI	Labour Market Information
NAITA	National Apprentice and Industrial Training Authority
NCS	National Competency Standards
NDMC	NCS and curriculum development monitoring committee
NITAC	National Industrial and Training Advisory Committee
NVQ	National Vocational Qualification
NYSC	National Youth Services Council
OJT	On the Job Training
RPL	Recognition of Prior Learning
TVEC	Tertiary and Vocational Education Commission
TVET	Technical and Vocational Education and Training
UOVT / UNIVOTEC	University of Vocational Technology

Glossary of Terms

Accreditation	Confirmation that a particular course meets the requirements of the relevant NVQ qualifications
Assessment	Making a judgment on the competency of a person based on his /her performance or evidences of performance
Assessor	Assessor is referred to competency assessor who if officially authorized to make a judgment of satisfactory performance for certifications
Blooms-taxonomy	A classification system used to define different levels of human cognition—i.e., thinking, learning, and understanding etc.
Certificate	Qualification awarded at Levels 1 – 4 of the National Vocational Qualification Framework
Competency	Performance demonstrated by an individual to meet the standards specified in competency standards.
Competency Based Training	Training with continuous assessment against standards to ensure the development of relevant competencies during training
Credit	It is a common currency to value the amount of learning which is useful for the articulation of qualifications.
Curriculum	Collection of modules that specify how skills, knowledge, and attitudes specified in competency standards are transferred to learners.
Competency unit	A key activity or a job function of an occupation in which a person could be trained and assessed independently without interference from other activities of the occupation.
Competency Map	DACUM chart is also referred to as the competency map
Dimension of competencies	It is a broad concept of competency, which includes all aspects of performance as represented by task skills, task management skills, contingency management skills, and job/role environment skills.
Diploma	Qualification awarded at levels 5 & 6 of the National Vocational Qualification Framework
DACUM	A method of occupational analysis starting from basic level activities and going to higher level jobs
DACUM Chart	It is a pictorial presentation of Jobs/duties and tasks identified through an occupational analysis
Dual Training	Trainees in dual Training spend part of their training at a vocational school and the other part at a company.
Element of Competence	A building block of a competency unit
Employability Unit	Soft skills-related competency units that improve the potential of employment of qualification holders
Endorsement	A formal process of recognition of a Competency Standard as a National Competency Standard
Formative Assessment	Assessment that supports the formation of competencies. It is a form of continuous assessment

Functional Analysis	A method of occupational analysis starting from the key purpose at the top and goes down to the sub-functional level.
Functional Map	Pictorial presentation how functions are linked to key purpose of an occupation
Industry Lead Body	A body which plays a decisive or key role in developing the industry
Industry Sector Skills Council.	It is an industry led and industry body to address skills issues in respective industry sectors established in patronage of the line Ministry of Vocational Training and Skills development
Learning Objective / Outcome	It is the achievement target of a learner on completion of the learning module.
Level Descriptor	The National Vocational Qualification Framework has 7 levels of qualifications and those levels are described by level descriptors
National Competency Standards	It is a written specification of the knowledge, skills, and attitude widely recognized for effective workplace performance of the relevant occupation.
National Industrial Training Advisory Committee (NITAC)	This is a committee of members from industry, relevant professional institutions (incorporated by an Act of Parliament of Sri Lanka), Ministry of Labour, a trade union appointed by NAITA for respective industry sectors, representatives from public and private training providers including VTA, NAITA, DTET, NYSC and representatives from TVEC, UNIVOTEC, Ministry of Public Administration to advise on skills needs of the industry to validate NCS and curricula. Its' terms of reference are given in the NVQ Operation Manual
Module	It is a distinctly identifiable independent building blocks, of a curriculum
Qualification Package	Collection of competency units relevant to a job practiced in workplaces.
Summative assessment	It is the final assessment that summarizes all the competencies relevant to a qualification.3
Unit descriptor	It gives a broader description of the competency unit
National Vocational Qualification Framework	Sri Lanka national system of technical and vocational qualification that facilitates qualification progression in vertical and lateral directions
Validation	The process of confirming that a National Competency Standards meet the skills needs of the industry and relevant curriculum could deliver those competencies.

1.0 Introduction

1.1 Background

TVET system of Sri Lanka developed an NVQ framework in the early part of the 21st century in 2004 along with 45 National (Occupational) Competency Standards (NCS) and CBT curricula. Before the introduction of the NVQ Framework in 2004, TVET institutions had developed and used their owned curricula for courses. The NVQ Framework introduced a standardized process to develop the NCSs and curricula which facilitates all institutions to have uniform curricula and thereby ensure consistent course delivery. This was one of the great achievements compared to the pre-NVQ era before 2005 when institutions used their curricula developed based on their methods. TVEC in cooperation with the National Apprentice and Industrial Training Authority (NAITA) and the University of Vocational Technology (UOVT) has developed around 331 NVQ levels 1 -4 NCSs and curricula and 91 NVQ Level 5 & 6 NCSs and curricula as of 31st May, 2023. In this journey, TVEC has introduced many revisions to NCSs and the curricula development process through discussions and deliberations at the NVQ steering committee (a national-level committee convened by the TVEC comprising leading training institutions to discuss operational issues of NVQ implementation and agree on solutions).

This manual is an exercise to summarise all revisions with further innovations to develop NCSs and curricula that reflect the reality of workplace practices, training, and learning processes for young persons, industry practitioners, assessors, and teachers of the TVET sector.

1.2 Purpose of the Manual

At the inception of the NVQ framework, the NAITA developed National Competency Standards for respective occupations and UOVT developed CBT curricula which included curriculum outline, Learners' Guides, and Trainer's Guide. With the growth of the NVQ Framework, in order to meet the increasing demand for new NCSs and Curricula in many occupations, it has become necessary for the TVEC to seek the services of other training institutions, lead bodies and external consultants to develop them in time.

When multiple developers are involved, a necessity aroused for manual to be able to achieve and ensure;

i. NCSs and curricula comply with NVQ related policies specified in the NVQ Operations Manual;

ii. Standardized processes and procedures are applied for the development of NCSs and Curricula (Curriculum outline, learner guides, and .trainer guide);

iii. All developers follow the same set of guidelines, leading to consistency and quality in processes;

iv. Step-by-step instructions or guidelines followed;

v. Thorough occupational analyses are done to reflect workplace realities and practices of occupations; and

vi. Adopt competency-based assessments with a holistic perspective.

This Manual has incorporated some innovations in developing NVQ level 1 and 2 qualifications, packaging qualifications considering workplace practices, and identifying levels 3 & 4 for developing NVQ level 5 & 6 Diploma qualifications to provide the foundation skills of the relevant industry sector. Further, it has outlined quality, cost and time-effective methods for the revision of NCSs and Curricula.

The NCSs and curricula are said to be live documents. They need continuous improvement in line with the dynamism of technology and workplace practices. Accordingly, this Manual expects to provide that guidance in developing qualifications in the NVQ system.

2.0 What are Competency Standards and CBT Curricula?

2.1 Competency Standards

A Competency Standard is referred to as a document that lists competencies required to practice an occupation, job, or work in an industry sector. It is a performance-based document.

A Competency standard usually includes a list of competencies required for a particular job and the expected performance levels/indicators. It further includes information about required skills, knowledge, attitudes, and behavioral aspects that are required for the successful performance of that job/occupation.

As occupational standards are widely accepted or recognized documents, they should be prepared by engaging relevant industry experts and stakeholders. When they are nationally accepted, they are named National Competency Standards.National Competency Standards have many uses namely;

- They define the competencies; skills, knowledge, and attitudes, required to perform respective occupations or occupational areas/industry sub-sectors.
- They could be used to assess the competency levels of performers of jobs.
- They could be used to develop curricula as those Competencies or Performances included in NCSs could be converted to learning outcomes.
- They could be used to develop many Human Resource Management tools such as job descriptions and performance matrices that could be used for the performance management of employees.

2.2 CBT Curricula

Competency-based training (CBT) is an education and training approach that focuses on developing specific skills, knowledge, and abilities in individuals to meet well-defined performance standards or competencies. The CBT curriculum is prepared with learning outcomes to facilitate trainees to acquire competencies specified in relevant NCS.

The CBT curriculum is usually delivered through a series of modules, each focused on a specific set of learning outcomes. In CBT programmes, learners progress through the modules at their own paces with the guidance of a teacher, coupled with continuous assessments designed to measure their mastery of each learning outcome. Theoretically, CBT is not time-based, but in the management of training; courses usually have a fixed starting time and fixed completion time. However, in case of not reaching the required competency levels, trainees should be facilitated with repeated practices during training. CBT curriculum must be implemented with the formative assessment (Continuous Assessment) which may include practical works, workplace assignments, as well as written or online knowledge assessments.

Under the NVQ Framework of Sri Lanka, CBT curricula are also validated and endorsed documents consisting of three parts.

i. Curriculum Outline – Consists of modules developed based on learning objectives to achieve competencies specified in National Competency Standards.

ii. Learner Guide – Performance guide for both trainees and trainers.

iii. Trainer Guide - Guide for trainers on competency-based training.

This manual will give guidelines for the development of four documents; NCS, curriculum outline, leaner guide, and trainer guide for respective occupation.

3.0 Development of NCSs and Curricula

This section will explain the processes of developing NCSs, CBT curricula, Learner Guides, and Trainer Guides in the following steps.

i. Identify occupations /Industry sectors for NCS development

ii. Approve occupations / Industry Sectors for the Development of NCSs and CBT Curricula by NCS and curriculum development monitoring committee (NDMC).

iii. Assign developments to relevant development institutions by NDMC.

iv. The naming of NCSs and Curricula

v. Analyze occupations to identify jobs/key job functions and their tasks/functions

vi. Develop competency units with elements and performance criteria

vii. Develop qualification packages

viii. Refer to Credit Policy of NVQ Qualifications

ix. Compile competency units/job functions to finalize NCS

x. Develop CBT Curriculum Outlines

xi. Develop Learner Guide on Competency Based Training

xii. Develop Trainer Guide on Competency-Based Training

xiii. Validate NCS and CBT Curriculum

xiv. Identify Code for NCS and CBT Curriculum

xv. Endorse NCS and Curriculum as National documents

xvi. Revision of NCS and CBT Curriculum

3.1 Identification of Occupations / Industry Sectors for NCS Development

Under the NVQ Framework of Sri Lanka, there are two categories of NCSs; NVQ Level 1-4 NCSs and NVQ Level 5 & 6 NCSs. According to the NVQ level descriptors in the NVQ Operations Manual, NVQ levels 1 -4 NCSs focus more on skills and specific applications of skills. On the contrary, NVQ levels 5 & 6 focus more on cognition and the application of skills in a broader spectrum of work. Therefore, two different approaches are used to develop NCSs of NVQ levels 1-4 for occupations and NVQ levels 5 & 6 for industry sectors.

3.1.1 Sources for Identification of Needs for New NCS

NVQ Framework expects to develop NVQ qualifications for the full spectrum of the labour market. Therefore, it is necessary to identify occupations that are not yet covered by the NVQ framework and develop NCSs for all such occupations and industry sectors. Occupations and industry sectors could be identified from the following sources.

i. Labour Market Information (LMI) bulletin and survey of newspapers and websites for job vacancies.

ii. Vocational Education and Training Plans developed by TVEC for industry sectors and provinces

iii. TVET Guide and database of registered training centres and courses of TVEC to identify courses without NVQs

iv. Courses conducted by professional Institutions

v. Jobs specified in Wages Boards of the Department of Labour

vi. Demands of and departures for foreign employment.

vii. International labour market trends, talent shortage surveys, and international Occupational outlook manuals

viii. Requests from lead bodies/ industry and citizens of the country for the development of NCSs and Curricula

3.1.2 Identification of Occupations for Development of NVQ Level 1-4 NCSs

The criteria for identification of an occupation/industry sector for the development of a NCS are listed below;

i. Availability of significant employment opportunities. Demand for the relevant qualification and its growth should be considered.

ii. Potential to have a significant social and economic contribution

iii. Potential for foreign employment

iv. Feasibility to implement the training in training centers and/or apprenticeship, award qualifications, and assure employability at a satisfactory level and/or certification of industry employees through Recognition of Prior Learning(RPL)

v. Compatibility with the policies of the government and policies specified in the development plans of TVEC.

vi. Facilitation for horizontal and vertical articulation in career progression

vii. No significant overlap of competencies with any other occupation for which NCS is already developed

viii. Availability of relevant NVQ Levels 5 & 6 or potential to develop relevant NVQ Levels 5 & 6 courses

Some Issues to be avoided in the identification of occupations for the development of NCS are given in Box A1 in Annexure 7.

3.1.3 Identification of Industry Sub-sectors for Development of NVQ Levels 5 & 6 NCSs

As explained in the NVQ Operation Manual – 2021, NVQ Levels 5 & 6 NCSs are developed for Industry sub-sectors or their related technology Sectors (See Box A2 in Annexure 7).

NVQ is a work based qualification[1]. For example, when the construction sector is concerned, a person usually works in one of its sub-sectors such as Building, Irrigation, roads, quantity surveying, water, environment, etc. NVQ level 5 & 6 qualifications are developed only for respective industry sub-sectors as qualification holders usually work only in one industry sector. Further, in addition to the criteria specified for identification of NVQ Levels 1-4 courses, identification of the Industry sector/occupational area for NVQ Levels 5 & 6 should meet the following criteria as well.

i. NVQ level 5 National diploma should match with the NVQ level 5 descriptor.

ii. NVQ level 6 should match with the NVQ level 6 descriptor.

iii. NVQ levels 5 & 6 diplomas should be developed to give cognitive progression to relevant NVQ level 4 holders.

iv. The availability of relevant degree programmes in UOVT or the potential to develop relevant degree programmes may be considered.

v. Avoid development of NVQ Level 5 & 6 qualifications for small labour market. Please refer to Box A3 in Annexure 7 on the small labor market.

[1] https://www.vocationaltraining.org.uk/nvq-overview

3.1.4 Approval of Occupations / Industry Sectors for Development of NCSs and CBT Curricula

TVEC shall identify occupations and industry sectors that need new NCSs and CBT curricula based on labour market requirements and submit them to the Director General using the format for submission of proposals for the development of new NCS (Annexure 1). Any other interested party also could submit proposals for the development of new NCSs in the same format.

The director (NVQ) of the TVEC, in turn, submits them to the Committee on Monitoring the Development of NCSs and CBT Curricula (Annexure 2 for TOR) for further actions and follow-up actions.The NCS and curriculum development monitoring committee (NDMC) analyses those proposals based on the guidelines specified in sections 3.1.2 and 3.1.3. The Term of reference of NDMC is given in Annexure 2. When there are requests for the development of too many NCSs, the NDMC recommends the priority order based on each NCS's impact on the economy, the policy priorities, and the availability of funding. While making recommendations for approval of new occupations for development of NCSs and Curricula, the NDMC recommends the assigning of development work to respective institutions too. Thereafter, the Director (NVQ) takes actions to develop the document in liaison with the assigned institution

3.1.5 Assign developments to relevant development Institutions

At the inception of the NVQ framework, NCSs and Curricula development were initiated as a tri-party activity of the following institutions.

TVEC - Identification of needs for new NCSs and curricula and endorsement body.

NAITA- Develop both NCS and curriculum and appoint NITAC for industry sectors

UOVT- Develop both NCS and curriculum

In addition, Industry lead bodies, Industry Sector Skill councils, and Subject experts with expertise in curriculum development could undertake the development of NCS and CBT curricula. However, all NCSs and Curricula should be validated by the NITACs appointed by the NAITA.

3.1.6 Naming of NCSs and Curricula

According to current practices, NVQ Levels 1 – 4 NCSs are developed for occupations, and NVQ Levels 5 & 6 NCSs are developed for occupational areas/industry sectors or technology sectors. If the name of the occupation or industry sector is widely or universally used, the same name would be used for the NCS. In case, occupation is not universal or not widely used, the name of the NCS could be decided based on the purpose of the occupation and its operational area to keep the flexibility for employers to use appropriate designations for the qualification holders. Please refer to box A4 in Annexure 7 for examples for naming NCSs by names of operations

4.0 Occupational Analysis

Occupational analysis is a term used for dissecting an occupation to identify its parts/activities, which are usually called Key functional areas, Functions and sub-functions, jobs[2] and tasks. It is a systematic process used in vocational education and workforce development to define and understand the specific requirements and competencies associated with a particular occupation.

Three different methods used for occupational analysis are listed below

i. Functional analysis

ii. DACUM analysis

iii. Survey of Literature and workplaces by an expert in the occupation having expertise in curriculum development.

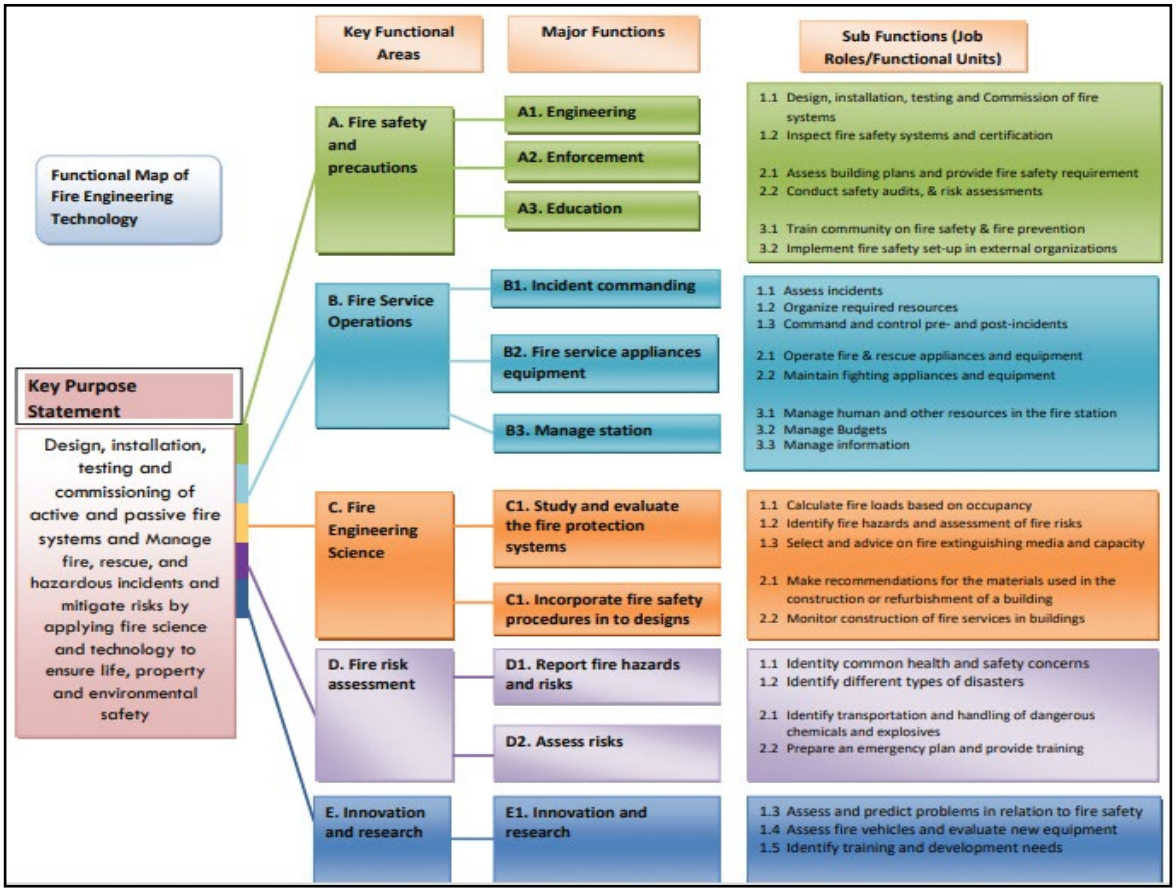
4.1 What is Functional Analysis?

Functional analyses is used to analyze entire industry or occupational sector to identify individual occupations, their key purposes, key functional area. This useful to define the broad overview of the occupation's functions and sub-functions. As the functional analyses focuses on broader scope of an industry sector, it is usually done through discussion with industry experts.

[2] Though word 'duties' is used in previous analyses, this manual uses the word 'jobs' instead of word 'duties' as the NVQ Operation Manual have used the word 'jobs' and that may be because word 'jobs' is a more industry friendly jargon.(Refer the section 3.5.1 in page 39)

The functional analysis starts with the identification of the key purpose of the occupational area and proceeds to identify key functions to achieve the key purpose. It could go to the next level and identify the functions for key functional areas as depicted below.

Figure 1 : Functional Analysis map



Source: TVEC

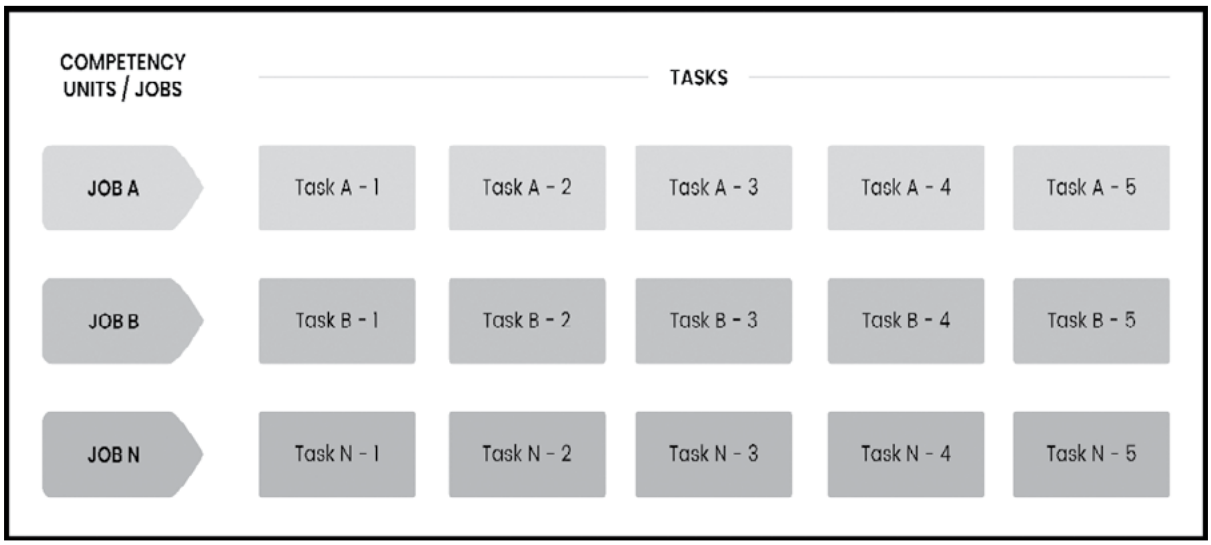
Functional analyses are used to analyze industry sectors/occupational areas, therefore, it is used for the development of NVQ Levels 5 & 6 NCSs and curricula.

4.2 DACUM Analysis

DACUM is the acronym for the 'Development of a Curriculum' and it is a method to do occupational analyses with more detailed, task-focused approach. This is a guided focused group discussion by a facilitator together with 6 to 10 occupational practitioners to identify duties/jobs[3] and tasks and their relationship in an occupation as depicted in Figure 2.

[3] Occupational analyses is an industry related and better to use the word 'job' as it is an industry jargon. Here job is a work area or collection of tasks. For example 'job card'.

Figure 2: Structure of the Occupational Profile Chart (DACUM Chart)



This expert group should be selected based on their experience and expertise in different roles of the occupation. At least two of them should be supervisors of the target occupation. They could be selected in consultation with the relevant National Industrial Training Advisory Committee (NITAC) appointed by NAITA and the Industry Sector Skills Council. This expert group is called the "development group". DACUM is traditionally used to capture current work practices. But, many countries incorporate future trends and concerns into occupational analyses. Therefore, the DACUM workshop facilitator has a role to capture current practices as well as future trends.

Some large scale industries have company specific standards and those practices may not have been applied in the wider industry. Therefore, the facilitator has a role to capture practices used in the wider industry. DACUM based occupation analyses follow the following

Step 1

i. The Development Group identifies occupational hierarchy; occupations in above, in below, and in parallel, and thus decides the boundaries of the occupation to be analyzed.

ii. Identify job roles of the occupations. Some occupations such as operative trades performed by one person. Some occupations are performed by a team of different skill levels. This factor should be taken into consideration in occupational analyses.

iii. Identify job roles of both waged employment and self-employment if relevant.

iv. Identify how a person acquires skills to start practicing the occupation and what are promotional paths.

v. In order to develop an occupational outlook, identify current and future trends in occupation with the following information

- Job growth or decline

- Salaries and income level
- Demographic factors affecting the work workforce
- Changes in regulation and industry standards
- Physical factors such as height, muscle eyesight and hearing.

These factors could be verified from the Occupational Outlook Handbook of the US Bureau of Labour Statistics [4] .

Step 2

i. The facilitator asks the development group to tell the activities done under the occupation. Those tasks could be written on a whiteboard. Or else participants could write activities on a zopp[5] card. This process need a recorder to effectively record them. and the facilitator or his/her assistant could pin them on a board.

ii. In the case of an occupation handled by a team together, the work of all team members should be taken into consideration. A team may consist of workers of different skills levels. All their works should be identified.

iii. In case jobs are practiced as waged employment and self-employment, both roles should be taken into consideration.

iv. Future trends in occupations should be taken into consideration. It is proposed in various fora that Sri Lanka should move into the knowledge economy. Therefore, it is necessary to develop knowledge workers. For example, at present most technicians are trained to do repairs through parts replacement. It is not a knowledge workers' role. Instead, they should be trained to repair relevant parts. It may be a circuit or a control unit. This will facilitate them to have higher income and to save the foreign exchange to the country.

v. There is a trend in greening occupations and therefore activities related to greening of occupations and their waste management should be identified.

vi. Almost all jobs whatever the levels have ICT applications and therefore ICT applications should be taken into consideration.

Step 3

The development group studies each card and identifies key activities and their relevant supporting activities. This is a brainstorming process and while evaluating activities written in cards, participants could propose more activities or revise already written activities. At the end of this process, it produces the DACUM chart as depicted above and it is called the competency profile.

In case of an occupation such as automobile mechanics are handled by a team of people at different skills levels. In this type of occupations, key activities are handled by fully competent persons or master craftsman. Other team members who are at competent, semi-skills and lower skills levels assist master craftsman to handle key activities. In fact competent, semi-skills and low

[4] https://www.bls.gov/ooh/a-z-index.htm

[5] ZOPP card – 9" x 4" bristle board card used. ZOPP is a German abbreviation for Goal/ object Oriented Project Planning. This planning workshop uses these cards and therefore, it is called ZOPP card.

skill people attend to sub activities relevant to their skills levels.

In case of analyzing occupation handled by a team, while identifying key activities, supporting, assisting and helping key activities should be identified for the work performed by team members of lower skill levels. For example, how supporting, assisting[6] and helping key activities are identified for a key activity 'Repair Cooling System' of Automobile mechanic occupation is given below. This is only a model for an example and not a validated unit.

Box 1 : DACUM Chart of a Competency unit performed by team of different Skill Level

Repair Engine Cooling System (A key Activity)	1.Check the Operation, check repair manual and give instruction on diagnosing the troubles and safe procedures.	2.Pressure test the water cooling system and identify the leaks.	3.Check electrical system and identify troubles (fans and thermostats)	4. Check mechanical parts, water pump, Fan belts and hoses and identify troubles.	5. Records troubles and report and get approval.
	6. Plan the repair and arrange the workplace	7.Flush old coolant, debris, and contaminants	8. Dismantles cooling system	9. Wash the dismantled parts	10. Identify defective parts
	11. Order/ procure defective parts	12.Do minor repair of radiator or outsourced radiator repair	12. Receive new and repaired parts	13.Assemble cooling system	14. Put new coolant
	15 Conduct post repair test/check for quality assurance	16. Remove defective parts and hand over the tools to tools store	17. Clean the workplace		

[6] Support Vs Assist; Support = he took an active role in the team's work like he was just another employee, Assist = he was given a couple tasks by the employees to help them get their work done faster (https://ell.stackexchange.com/questions/238735/assist-vs-support)

Support Repair Engine Cooling System	1.Assist in the diagnosing and troubles shooting on guidance and instruction	2.Pressure test the water cooling system and identify the leaks.	3.Check electrical system and identify troubles (fans and thermostats)	4. Check mechanical parts, water pump, Fan belts and hoses and identify troubles.	5. Records troubles and report and get approval.
	6. Plan the repair and arrange the workplace	7.Flush old coolant, debris, and contaminants	8. Dismantles cooling system	9. Wash the dismantled parts	10. Identify defective parts
	11. Order/ procure defective parts	12. Do a minor repair of the radiator or outsourced radiator repair	12. Receive new and repaired parts	13.Assemble cooling system	14. Put new coolant
	15 Assist in post repair test/ check for quality assurance	16. Remove defective parts and hand over the tools to tools store.	17. Clean the workplace		
Assist in Repair Engine Cooling System	7.Flush old coolant, debris, and contaminants	8. Dismantles cooling system	9. Wash the dismantled parts	16. Remove defective parts and hand over the tools to tools store.	17. Clean the workplace
	18. Assist in all level activities				
Help in Repair	9. Wash the	16. Remove	17. Clean the		
Engine Cooling System	dismantled parts	defective parts and hand over the tools to tools store.	workplace		

Step 4

Analyze Tasks of DACUM Chart

These tasks are analyzed to identify the following information.

i. Break down the tasks into steps.

ii. Identify the difficulty of tasks based on the number of steps, level of skills, expertise, and physical demand.

iii. Assess the level of decisions, and risk involved thus deciding the responsibility level.

iv. Assess the learning difficulty and cognitive processing required.

v. Performance standards/criteria to facilitate the assessment of performance.

vi. Underpinning knowledge and skills required for the performance of the task.

vii. Safety measures need to be taken.

viii. Critical factors of assessments.

ix. Relevant Standards to be followed / adhered to.

4.3 Occupational analysis through surveys of literature and workplaces

Initially, an expert in the occupation with a wider knowledge of the labour market and curriculum development could identify the key functions and sub-functions or duties and tasks of the same occupation from the following sources.

i. Job descriptions/duty lists of persons practicing the occupation

ii. Download the relevant DACUM chart and job descriptions

iii. Non-NVQ curriculum being used

iv. Use own network to collect information

v. Make workplace observations

vi. Explore Emerging trends and the latest technologies from the internet

After collecting that information, the expert could draft a DACUM chart or a Functional map and thereafter have a focus group discussion with the development group to revise and validate the draft DACUM chart which could be completed within a day.

4.4 Use of DACUM charts and Functional Maps to develop NCSs

An NCS consists of a number of competency units. A competency unit has a list of competency elements and relevant performance criteria. Performance criteria are standards to be achieved when performing a relevant element.

A Competency profile consists of a list of jobs and their relevant tasks. A job is a competency or work area and that could be considered as a competency unit. But then the tasks have to be converted to elements. Is it necessary? And what is the difference between a competency element and a task?

Jobs or key functions identified through occupational analyses are considered Competency units which are work areas of an occupation that could be performed and assessed without overlapping with the other work areas of the same occupation. Each Competency unit consists of a number of elements which is an elementary area of the work.

Box 2 : Definition of an element of a Competency unit

Elements of competency

Any of the basic building blocks of a unit of competency that describe the key activities that must be performed to demonstrate competence in the tasks covered by the unit [7]

The competency element means an action that constitutes a task that has a triggering event and a terminating event that clearly defines its limits and an observable outcome.

The element as defined in the UNIVOC document is given below.

“Element of competency is a description of tasks that should be carried out by a worker”

Definitions of competency elements and tasks, taken from the ChatGPT are given below.

4.4.1 Competency Elements

Competency elements are broad categories or clusters of related skills and knowledge that encompass the essential aspects of a job or an occupation. They represent the key areas of expertise and performance required for someone to be considered competent in that particular role. These elements are often presented as high-level statements that outline the core competencies needed.

[7] **Source:**

NCVER (Australia), VOCEDplus: Glossary of VET, (accessed 12/2022)

4.4.2 Tasks

Tasks, on the other hand, are specific activities or actions that individuals in the occupation are expected to perform as part of their job. These tasks are directly related to the day-to-day responsibilities and duties of the role. Tasks are more detailed and specific compared to competency elements, and they outline the specific actions or operations that a competent individual should be able to execute.

ChatGPT further indicated that tasks help in breaking down the job into discrete actions, making it easier to assess and evaluate the competence of individuals in the specific tasks they perform

NVQ assessments are based on competency elements and performance criteria. But, ChatGPT says that it is easier to assess and evaluate individuals base on the specific tasks they perform.

Occupational profile (DACUM) chart may have some tasks covering a broader area of work and they may be equivalent to elements.

Some tasks are narrower. Therefore, tasks of a DACUM chart could be considered as Elements/ tasks and taken directly to the relevant competency unit. As CBT curricula also need tasks and standards (Performance criteria) for continuous assessments. When performance criteria against tasks are given in NCS, the same performance criteria could be used for continuous assessments in the delivery of courses.

When tasks of a job are directly taken to a competency unit, there will be a large number of elements/tasks in a competency unit. As an element covers a border work area than a task, the element gets a higher number of performance criteria than that of a task.

Therefore, a higher number of tasks does not mean a higher number of performance criteria. Whether a competency unit has elements or tasks, it will have almost the same number of performance criteria. Therefore, the length of a unit will not be an issue.

5.0 Development of Competency units

A competency unit has a number of components and they are arranged according to a particular format as presented in the Box 2.

5.1 Format of the competency unit of an occupation in which jobs are performed by individuals

This format is almost similar to the formats used in NCS developed previously. However, the unit code is added with a level of the unit. In the past, levels of units are given on a separate column of a qualification packaging page. Instead, the level of the unit should be added to the Unit code. Then unit level will be available with the unit itself.

Box 3 : The Format of the competency unit

Unit Title / Job Function	**Title to name the competency of the work area as an outcome or function**		
NVQ Level of the Unit	NVQ Level	Credit (Learning time)	To be calculated after summing up of learning time of relevant modules.
Descriptor Descriptor	Description to provide further information about work related to the unit or function		
Unit Code	NCS code + unit number U1 to Un. 'n' is the number of units in the NCS+ NVQ Level of the Unit		

Elements of Competence/job function	Performance Criteria / Performance Standards
The competency element is an action that constitutes a task that has a triggering effect and a terminating event that clearly defines its limits and an observable outcome. It Should begin with an action verb, contain an object, and a conditional or contextual statement.	They are the performance standards widely accepted in the industry. They should be specific with quality outcome measurement as far as possible. They should be demonstrable. Written in passive form (Example for writing style; (Work pieces cut to the given measurements). It should address all dimensions of competencies. There could be a number of Performance Criteria. However, if there are more than 6 to 8 performance criteria, consider sub-dividing the element/task concerned.

5.1.1 Range Statement

This is the range of operation or boundaries of operation. It further explains the place of operation and under what conditions works are carried out.In addition, the following information also should be provided.

i. A list of tools, equipment, and material

ii. Any regulation related to work. Regulation names alone are not sufficient. Relevant clauses should be specified.

iii. Any national and international standards to be adhered to in works. Here also, relevant clauses should be specified.

iv. Any specification relevant to the work

v. Elaboration of new terms and abbreviations used in elements and performance criteria.

vi. If the performer needs to have any physical capacity or attributes, these should be specified.

5.1.2 Guides for Assessments

The following issues should be addressed in the assessment guide;

i. The form/type of assessment recommended (Formative assessment, Summative assessment, evidence-based evaluations, written test, etc.,)

ii. In the case of written test, the type of written test to be specified

iii. The context of assessment, where assessment could be carried out.

iv. In the case of evidence-based Assessment – Evidences should be checked against each element and should be available from a minimum of two sources and two situations.

v. All underpinning knowledge and underpinning skills should be assessed.

vi. In the case of candidates with disabilities, NVQ Circular NVQ 1/2020 – Reasonable Adjustment in NVQ Assessment for candidates with disabilities (or newer version) should be followed

vii. All dimensions of competencies should be addressed in the assessments as listed below;

   a. Task skills - performance of individual tasks

   b. Task management skills – Able to manage preparation and peripheral activities that are required for effective performance.

   c. Task contingency skills - Responding appropriately to irregularities and breakdowns in a routine within a job or workplace

   d. job/role environment skills - Able to deal with the responsibilities and expectations of the work environment.

If assessment guides do not have a unit-wise variation, a separate assessment guide could be given in a separate section.

5.1.3 Critical aspects

Competencies and performance criteria that are absolutely essential for success in performing the respective competency elements should be included here.

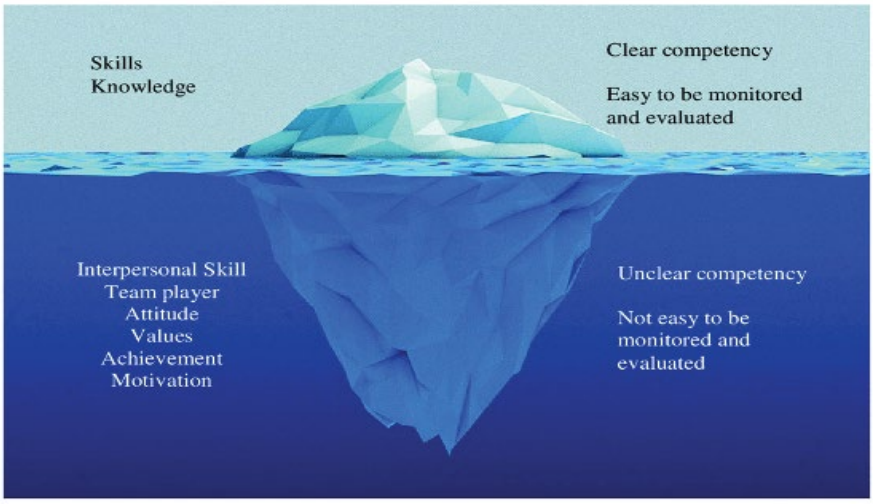
5.1.4 Underpinning Knowledge and Skills

The underpinning knowledge and skills refer to the foundational knowledge and essential skills required to perform a particular activity[8]. It further explains that both underpinning knowledge and skills are very important to understand the theory, and concept and apply skills effectively.

Competency elements listed in competency units are visible while performing the relevant functions. Underpinning knowledge and skills are attributes that cannot be seen as explained in the competency iceberg in the figure given below.

[8]https://chat.openai.com/chat

Figure 3 : Competency iceberg



Source:https://www.researchgate.net/figure/Iceberg-competency-model-MIT-Careers-2005_fig3_282971399/download

Underpinning knowledge and skills are referred to as;

i. Foundation knowledge and skills required to perform all competency elements could be listed under the underpinning knowledge and skills.

ii. Knowledge and skills considered for curriculum and assessment only should be included under the underpinning knowledge and skills. (Important; Any underpinning knowledge and skills, if not considered for training and assessment, should not be written)

iii. Underpinning knowledge and skills should be specific and should not be vague statements (In the case of mathematics knowledge, what mathematics knowledge/skills should be specified)

iv. Underpinning knowledge and skills are not competencies, and therefore they are not written with action verbs. They are written in noun form. They should be numbered for easy reference.

v. Depth of learning and assessment of underpinning knowledge and skills should be decided considering the level descriptor of the relevant qualification

5.2 Basic Competency Units

Though relevant soft skills are specified in Underpinning knowledge and skills, to make sure they are not overlooked and maintained consistency in training and assessments, the following soft skills are added to NCS as basic competency units.

i. Communication

ii. teamwork

iii. Occupational Health and safety

iv. Basic literacy & numeracy

The NCS development committee could assess relevant underpinning knowledge and skills and decide to add them to the list of competency units.

5.3 Assigning Competency Levels to Competency Units

According to the Level Descriptor of the NVQ Operation Manual, levels are determined based on three factors; process complexity, learning demand, and responsibility. NVQ Levels have a 1 to 7 scale. Levels of the above three factors relevant to a competency should be determined based on the same scale. It is an expert judgment made in consideration of the following parameters.

Box 4 : Parameters of process complexity, learning demand, and responsibility

Process Complexity	Learning Demand	Responsibility
i. Identify the variables and factors that can affect the complexity of each process step	**i.** Processes with higher complexity have a higher learning demand	**i.** A Jobs role directory related to accurate performance and customer satisfaction has a higher level of responsibility.
ii. Consider the number of variables to control and the number of controls and interconnections	**ii.** Competency element with a higher cognitive component needs longer time for learning and takes a longer time to reach long-term memory.	**ii.** Holders of high-risk jobs have a higher level of responsibility
iii. Assess the number of decision points and the complexity of decisions made within a process. More decision points and complex choices often indicate higher complexity	**iii.** Procedural skills (ex – riding a bicycle) need shorter learning time and those skills retain a longer time.	**iii.** If any failure will lead to high economic, financial, and social losses, those processes have a higher level of responsibility
iv. Analyze the complexity in the flow of information, materials, or tasks within a process	**iv.** Jobs that need higher hand dexterity take longer time to develop skills	**iv.** Processes that contribute to revenue generation, cost saving and profitability have higher responsibility
v. Longer process durations can contribute to increased complexity	**v.** A higher failure rate in equivalent or relevant courses is an indicator of higher learning time	**v.** More complex tasks and broader areas of oversight generally entail a higher level of responsibility
vi. High diversity in resources and equipment required will lead to higher process complexity.	**vi.** Fast revision of industry standards/regulations demands higher learning skills.	
vii. Processes with a higher risk of errors can be considered more complex	**vii.** Actions related to higher levels of Bloom's Taxonomy demand higher levels of learning	

Process Complexity	Learning Demand	Responsibility
viii. Industries with stringent regulations and compliance requirements often have more complex processes to ensure compliance **ix.** Industry benchmarks and best practices will be useful in understanding the complexities of processes **x.** Higher frequency in operations will lead to higher complexity in processes		

When values for Process complexity, Learning demand, and Responsibility are determined, their arithmetic average will be taken as the Level of the Competency unit. For crafts occupations, values of the above factors will be within 1 to 4 levels. But, here 1 to 7 scale is used as some craft level occupations may have graduate-level responsibility.

5.4 NCS Unit Bank

TVEC has developed an NCS Unit Bank (https://nvq.gov.lk/Report_Inquires /Search_NCS_Units.php) by uploading all competency units in NCSs developed already. Once the development group decides on the Unit titles, the facilitator could explore the relevant units from the Unit Bank and customize them with the support of the development group. Re-use or customizing readily available units will save time and cost of development in a significant amount.

A similar exercise could be performed when developing the relevant curriculum modules or re-used units with the support of unit-to-module mapping table.

6.0 Development of Qualifications

Qualification is an award given for abilities to perform a group of competency units/ job functions relevant to a job practiced in the industry. But no training institutions could train or no youth could learn all the skills demanded by the industry. Training institutions usually provide skills to youth for entry-level jobs and skills to do further learning to enable new entrants to acquire further skills while doing the jobs. Therefore, NCS should facilitate entry-level qualifications as well as qualifications to recognize up-skilling or further learning in workplaces.

6.1 Development of NVQ Levels 1 - 4 Qualifications

In an occupation where jobs are performed by an individual, qualifications are prepared by packaging or grouping competency units relevant to respective jobs. The competency level of a qualification will be the arithmetical average of the competency levels of units within the qualification.

When packaging competency units, the following factors should be taken into consideration.

i. Labour Market entry level NVQ level 3 & 4 qualifications should be available. These entry-level qualifications should be deliverable in training centers.

ii. There cannot be two or more NVQ levels 3,2 and 1 qualifications because at workplaces, supervisors assign them any work relevant to their skill levels. (Even when two persons with two NVQ level 3 in the same occupation work in a shop floor, the supervisor assigns them work considering shop floor requirements, irrespective of their qualifications. That is why two NVQ level 3 qualifications are not a reality in a workplace)

iii. When there are two NVQ Level 4 qualifications, they should be given a name specific to the nature of the jobs. For example, one NVQ level 4 which could be delivered in training centers may be named Mechanics. Another NVQ Level 4 in which competencies could be acquired only through work experience may be named as technicians. Here, NVQ Level 4 for technicians should not be an entry-level qualification and hence it should not be delivered in training centres.

iv. If there is a package with very advanced technologies, that may be named Advanced Technicians of NVQ level 5 Certificate (Not a Diploma).

6.2 Credit Policy of NVQ Qualifications

NVQ Framework has defined 1 credit equal to 25 notional hours of learning which recognizes classroom learning, study assignments, self-learning as well as workplace learning.

Box 5 : Credit policy of National Vocational Qualifications

NVQ level	Type of certificate	No. of credits
1	National Certificates	Minimum 15 credits at level 1 or above
2	National Certificates	Minimum 15 credits at level 2 or above
3	National Certificates	Minimum 15 credits at level 3 or above
4	National Certificates	Minimum 15 credits at level 4 or above
5	National Certificates	Level 4 + Minimum 15 credits at Level 5 on Relevant advanced technologies
6	Higher National Certificates	Level 4 + Minimum 30 credits at level 6 on Relevant advanced technologies
5	National Diploma	60 credits of which 40 of level 5 credits (Minimum) and 20 of levels 3 and 4 credits(Maximum)
6	Higher National Diploma	120 credits of which 50 level 6 credits (Minimum) + 40 level 5 credits (Minimum) and 30 levels 3 and 4 credits(Maximum)

6.3 Development of NVQ Level 5 & 6 Certificate level qualifications

This is still a new concept and a need has emerged to recognize advanced skills acquired by NVQ level 4 certificate holders on advanced technologies. When NVQ level 4 Automobile technicians become very competent in hybrid and electrical motor vehicle technologies through work experience, those advanced skills could be recognized through NVQ level 5 Certificates. In the future, automobile technologies will be further advanced with remote control vehicles and artificial intelligence and those advanced competencies will be recognized through an NVQ Level 6 certificate.

6.4 Development of NVQ Levels 5 & 6 Diploma level qualifications

The NVQ Levels 5 and 6 diploma qualifications are prepared by combining three types of competency units/job functions.

i. Sector-specific core competency units – these are sector-specific competencies representing the core of the industry sector. They must be marked as compulsory units/job functions.

ii. Employability Units - These are generic competency units that are required by all employees to perform effectively in the workplace. These include those generally referred to as soft skills. They could be imported from other NVQs if relevant. Sector-specific employability units can be developed if necessary.

iii. Elective Competency units – They are optional subjects to facilitate specialization. For example, NVQ Levels 5 & 6 Electrical Technology may have electives to give specializations in Alternative Energy, Solar Energy, Energy Management, etc.

The NVQ Operation Manual 2021 has specified the following criteria for the selection of different types of job functions (competency units) for NVQ Levels 5 & 6 qualifications.

Box 6 : Proportion of Credits in NVQ Levels 5 & 6 courses

- Minimum of 2/3 of total credits should be of relevant sub-sector competencies
- Minimum of 1/6 of total credits should be of employability competencies (Soft Skills) identified under underpinning knowledge and skills.
- Balance to make up the total required credits should be from other sub – sectors of the industry to facilitate career navigation.

Source: Section 3.5.4 NVQ Operation Manual

It is necessary to apply the above criteria for the selection of 40 credits of NVQ Levels 5 & 6 competency units only. NVQ Levels 3 &4 competency units could be imported from relevant level 3 & 4 qualifications.

NVQ levels 5 & 6 qualifications have 20 and 30 NVQ level 3 & 4 credits respectively. This is to facilitate NVQ level 5 & 6 qualification holders to have some knowledge and skills in craft occupations of the industry sector. The same concept is followed in degree and diploma programs in the country.The first year of most engineering degree and diploma programmes is common whatever the specialization they will choose. That gives them broader foundations. The same concept has been applied to NVQ Levels 5 & 6 courses and here NVQ Level 3 & 4 credits are included to give them a broader foundation.

NVQ levels 5 & 6 Qualifications have many relevant levels 3 & 4 qualifications. For example, NVQ levels 5 & 6 Building Construction has the following relevant NVQ Levels 3 & 4 qualifications.

i. Construction Craftsman (Masonry)

ii. Carpentry Building

iii. Plumber

iv. Electrician (House wiring)

v. Bar Bender

NVQ level 5 diploma of Building Construction should have 20 credits of the most relevant NVQ levels 3 & 4 competency units/job functions that may be imported from the relevant NVQ Levels 3 & 4 Qualifications.

6.5 Articulation of Qualifications

Each NVQ level 1 – 4 NCS should specify what are the relevant NVQ Level 5 & 6 qualifications to enable NVQ level 1-4 qualification holders to understand the qualification progression available.

Similarly, NVQ level 5 & 6 NCS should have both relevant NVQ level 1 – 4 qualifications and relevant NVQ level 7 degrees available at the University of Vocational Technology.

If a NVQ level 1– 4 NCS has no relevant NVQ Level 5 & 6 courses for qualification progression, that should be indicated in the relevant NVQ Level 1- 4 NCS. Similarly if a NVQ levels 5 & 6 NCS has no relevant NVQ Level 7 degree courses for qualification progression that should be indicated in the relevant NVQ Levels 5 & 6 NCS.

7.0 Development of CBT Curriculum Outline

As explained earlier a National Competency Standard describes the skills and knowledge a person needs to perform effectively in the workplace. It does not describe how an individual should be trained. It is the curriculum that describes how an individual should be trained. Curricula are required to be developed to train persons to deliver competencies specified in NCSs considering learners' needs, abilities, and circumstances.

i. NCS specifies what to be trained and a curriculum specifies how to be trained.

ii. NCS specifies the working sequence and a curriculum specifies the learning sequence.

iii. NCS specifies the destination and curriculum specifies the path.

iv. NCS specifies performance outcomes (competencies), and curriculum specifies learning outcomes.

As NCS has specified competencies, then training should ensure that trainees acquire those competencies. Therefore, during the training, it is necessary to regularly check whether trainees have acquired relevant competencies. If relevant competencies are not acquired, repeated practice should be facilitated. In fact, in competency-based training, acquisitions of competencies are used as the basis for measuring progress in training.

The curriculum outline introduced here will be useful to understand the training and learning processes for achieving of each competency and how they are assessed during the course.

7.1 Curriculum Development Committee

NCSs are developed by a group of 6 -10 industry experts. The curriculum is a training document and it is recommended to include 50% trainers and 50% industry experts in the curriculum development group.

7.2 Modularization of Curriculum Outline

As specified in the NVQ Operation Manual – 2021, for convenience in the teaching-learning process, learning outcomes specified in the CBT curriculum are sequenced into distinctly identifiable independent building blocks, referred to as “Modules”.

NCS specifies competency units and underpinning knowledge, skills, and attitude. When they are converted to learning outcomes, there will be four types of learning outcomes.

i. Competency learning outcomes

ii. Underpinning knowledge learning outcomes

iii. Underpinning skills learning outcomes

iv. Underpinning attitude learning outcomes

For trainers and learners to have frequent references to the curriculum and NCS, it is recommended to indicate the type of module concerning the relevant units of NCS. Further, according to the NVQ Operation Manual – 2021, one competency unit may have one or many learning outcomes. Similarly, one learning outcome may be based on more than one competency unit.

However, one module for two competency units should not be developed when those two competency units are in two qualification packages because then instructor will have to separate the learning content to two courses.

Format and different components of a module are given in the Box 8 below. When a module is included in courses of different NVQ levels, the depth of learning will vary. Accordingly, the duration of lessons varies.

Box 7 : Format of the CBT Curriculum

Module Title	It is based on the area of work /field relevant to the learning outcome
Module Aim	Module aim refers to general goal or purpose of the module
Module Code	NCS Code + M1 – n
Module Type	Competency / soft skills / Underpinning knowledge /and skills module
Module Category	Compulsory / Electives
Relevant Competency Units and Elements	

Pre-requisites	To be filled considering prior knowledge and skills required and the learning sequence to follow this module.		
Learning Outcomes/ Objectives			
Learning Content	Theory		
	Knowledge sub-title(learning time is given to understand the depth)		
	Practical		
	List of Practical and industry visits to train in NVQ levels 1 -4 – Tasks/ activities. Industry visits/ exposures followed by report submission		
	NVQ levels 5 & 6 – Lab Practical, assignments and industry visits with the preparation of reports / coursework and drawings		
Mode of Training Delivery	Classroom teaching Workshop/laboratory Practical Visit other training centres (Demonstrations on special machines)Industry visits (Specify) (Demonstrations on special machines) Structured Learning Experience (only for soft skills module- could be applied to industry visits too) (explained in the Trainer Guide) How to refer websites and standards		
Resources Required			
Prescribed Text and Reference Material	Reference material, books, and websites are to be specified and guided.		
Assessment Type	Assessment Methods	Assessment Weighting (Only for level 5 & 6)	
Formative Assessment	Theory – At the end of module, assess the theory with appropriate assignments		
	Practical: Assess based on the performance criteria of relevant elements of competency unit of NCS		
Semester End Assessment	Dependent on the assessment policy of the NVQ framework		

Learning Hours	Theory		Practical		Self-Study	

7.3 Description of Components of a Module

i. **Module Title** : It is based on the area of work /field relevant to the learning outcome.

ii. **Module Aim** : general goal or purpose of the module

iii. **Module Code :** NCS Code + M1 – n

iv. **Module Type** : Modules should be developed for the following areas

- Competency Modules

  Provide Competencies specified in each competency unit/job function, competency elements, and performance standards. They are called competency modules.

- Soft skills Modules

  Provide soft skills specified in Underpinning knowledge and skills. In NCS jargon, soft skills are named employability units or Basic competency units. However, to facilitate direct understanding, it may be ideal to name them as soft skills modules.

- Underpinning Knowledge, skills, and attitude modules

  All underpinning knowledge and skills should also be converted into learning modules. When soft skills in underpinning knowledge and skills are converted to learning modules, they are named soft skill modules. When balanced or the rest of the underpinning knowledge and skills are converted to learning modules, they are named the underpinning knowledge and skills modules.

v. **Module Category**

There are two types of modules; compulsory and elective. Elective Modules are optional and trainees could select them according to their interests. Training centres also could add elective modules to meet skills needs in the district and province of the training centre.

vi. **Relevant Competency Unit and Elements –** This is self-explanatory.

vii. **Learning Outcome / Objective**

To develop a curriculum, it is necessary to convert Performance outcomes (Job Function/ Competency unit) and underpinning knowledge, skills, and attitudes into learning outcomes/ objectives. It is appropriate to follow the steps listed below to write a learning outcome.

i. As this curriculum is competency-based, Learning Outcome /Objective should specify what a learner will be able to do/perform upon completion of learning.

ii. Identify the competency unit and its elements, and decide whether to write one learning outcome covering the whole unit or write 2 or 3 learning outcomes.

iii. Steps of Writing Learning Outcomes/Objectives

a. Write each outcome beginning with the phrase “After participating in this session, trainees should be able to. (Verb). + specific performance

b. Choose a verb that matches the desired level of knowledge or skills specified in the Competency units/elements. This verb should indicate specific, measurable, and observable behavior

c. The appropriate verb for the level of skills and knowledge could be selected from Bloom’s Taxonomy. [Remember, explain (From Understand), Apply (Perform), Analyze (Diagnose), Evaluate, and Create]

[9]Sources: http://edglossary.org/blooms-taxonomy/ and http://edorigami.wikispaces.com/Bloom’s+Digital+Taxonom

d. Avoid words like appreciate, believe, understand, know, and learn as they are not measurable[9].

e. Appropriate verbs for the bloom taxonomy level could be downloaded through an internet search of “List of Verbs for Formulating Educational Objectives”

viii. **Learning Content**

In developing learning content, it is necessary to;

a. Review the learning objective or the desired outcome in comparison with relevant competencies and knowledge specified in NCS. This includes understanding what knowledge, skills, or behaviors (attitudes) the learners are expected to acquire or demonstrate on completion of the module.

b. Analyze the target trainee group, and determine their current levels of knowledge or skills experience, learning style, and motivation. This will help to tailor the content to their capacities.

c. Decide learning content in consultation with a group of occupational experts and experienced trainers to bridge the gap between the current status and desired status of knowledge, skills, and behaviors. Write the content in simple language, and avoid jargon unfamiliar to trainees.

d. It may be possible to explore appropriate learning content for a learning objective from an internet search engine or https://chat.openai.com/chat and get it verified by trainers and industry experts.

e. Provide opportunities for practicing, apply knowledge, and do relevant exercises such as case studies, projects, workshop practices, etc.

f. Decide practical activities considering the levels of skills to be inculcated. If the learning objective involves acquiring a new skill, a hands-on activity will be essential.

g. Choose instructional strategies that are appropriate for the learning objective and the target audience. This may include lectures, discussions, demonstrations, simulations, case studies, or hands-on activities, among other things.

h. . After identifying learning contents, separate knowledge (Theory and practical activities and arrange them from simple to complex. Learning should be started with simple subjects and conclude and complete with complex subjects.

i. In order to identify the depth of learning content, break down the content into sub-topics and give their learning time duration. However, level descriptors relevant qualification level also should be considered in deciding the learning time.

j. Competency elements numbers[10] relevant to theory and practical should be indicated to facilitate continuous assessment.

[10] In the past, the Level 1 – 4 curriculum had tasks and standards to facilitate continuous assessment. Same facility could be built in this format as well, when relevant element number is given in from of each practical.

ix. Mode of Training Delivery

CBT curriculum could be used to develop and deliver the training in any mode of training delivery such as institutional training, apprenticeship, and dual training. Whatever the mode, it is necessary to facilitate the trainees to do workshop practices and laboratory practical in selected subject areas.

Some training centres may have limitations to facilitate training on all equipment specified in competency units and modules. This is further explained in the Trainer Guide section of this manual.

Many curricula have soft skills named basic modules (NVQ Levels 1 – 4) and Employability modules (NVQ Levels 5 & 6). The timetables of NVQ Levels 5 & 6 courses have training hours allocated for Employability modules. But, NVQ Levels 1 – 4 courses are overloaded with technical modules and therefore those courses have no time allocation for basic modules. Soft skills modules such as teamwork, communication, literacy, and numeracy are expected to be covered concurrently with other modules. For example, literacy and numeracy, teamwork, and communication could be addressed while training for technical modules. Further, how numerous annual events organized by training centers could be used to develop soft skills are explained in the Trainer Guide.

x. Prescribed text and Reference Material

Self-explanatory but trainees should be given instructions on how to refer to websites to facilitate further learning.

xi. End-of-Module Assessment

Choose appropriate assessment methods, such as quizzes, multiple choice questions, and practical exercises, to measure learners' achievement of skills and knowledge of the content and provide feedback on their progress.

xii. Assessment

Vocational Training programmes usually have two types of assessment; Formative assessment and summative assessment.

Formative assessment is a continuous assessment throughout the programme to provide feedback to help both teachers and students understand how learning is progressing and to make necessary adjustments to improve learning outcomes. The modules of curricula should specify the types of continuous assessment to be conducted at the end of each module. In case of NVQ Level 1 – 4 programmes, practical could be assessed against performance criteria of relevant competency element and record the performance in the Trainee's Progress Record Book.

Summative assessment, on the other hand, is an evaluation conducted at the end of a learning period to determine performance against performance criteria. Regarding Level 5 & 6, percentage weighting of Formative and Summative should be indicated.At present, only NVQ Levels 5 & 6 courses have semester-end examinations. It is better if the same practice is introduced to NVQ Levels 1 – 4 courses too. NVQ Levels 1 – 4 trainees are weak in written tests. Therefore, it is recommended for NVQ Levels 1 – 4 trainees to have at least two written tests before their final assessments.

xiii. **Learning Duration**

As explained in the format, total learning hours are estimated based on the learning time for theory, practical and self-studies. It is an estimation of notional hours of learning based on direct contact hours and self-learning.

- Instructions /Teaching – Teaching hours and tutorials
- Practical/Assignments – Laboratory time and study at home hours for writing coursework and Assignments
- Industry Visits – Industry contact hours and study at home hours for writing reports and discussions in the Classroom

Total learning time could be calculated by adding the time allocated for the above activities. However, learning time calculation may vary with the different modes of training. According to the Kolb's Learning Cycle, workplace learning time[11] may be calculated as twice of classroom / institutional learning time.

7.4 Semester Programmes of NVQ Levels 5 & 6 Courses

After development of modules of a NVQ level 5 or 6 Course, semester wise delivery plan should be developed. NVQ Operation Manual – 2021 has recommended following format to use for development of semester programmes.

Box 8 : A Format to develop semester programme

				Directed study		Self- directed study
Module Code	Module	Type C/E	Notional hours	Lectures/ Tutorials	Practical/ Industry visits	Take home assign ments / reading supplementary materials
Eg. F45C001 M04	Hydraulics 1	c	100	60	20	20
F45C001 M06	Surveying & Levelling	c	150	40	80	30

Source : NVQ Operation Manual – 2021 (Page 61)

If an NVQ level 5 or 6 competency unit has more than 6 credits, it is better to develop two modules with the names of Module (subject) 1 and Module 2 and they could be delivered in two semesters.

[11]This is a rough calculation. Kolb's learning cycle has four steps, two for working and two for reflection (Learning).

7.5 Mapping Sheet

The modules have indicated the relevant competency units and elements. Therefore, it is not difficult to identify modules relevant to a qualification which is a package of competency units. However, for convenience of trainers and learners, a table should be provided as shown below to map qualifications with competency units, and Modules and tasks of the competency profile.

Qualification Code	Relevant Competency Units	Relevant Curriculum Modules	Tasks / functions from competency profile/ functional map

7.6 Development of Occupational Outlook

Development of occupational outlook should be commenced at the identification of occupations for the development of the NCSs and curricula as it provides justification for the need for a new NCS. On completion of the occupational analyses, development of NCSs, and curricula, developers will have all relevant information to develop an occupational outlook.According to the Occupational Outlook Manual[12] published by the US Bureau of Labour Statistics, the Outlook of an Occupational consists of the following information.

i. Job Description

What are the works performed by a person practicing the occupation? In the case of NVQ Levels 5 & 6, explain the nature of jobs and work to be performed.

ii. Responsibilities

Social and economic impact of the performance

iii. Work environment

Technical or social environment, physical and ergonomics requirements, indoor or outdoor, etc.

iv. Career and Employment Opportunities

Labour Market situation, number in employment nationally and internationally, Job growth rate nationally and internationally, promotional prospects and foreign employment and self-employment potential.

v. Salaries and remuneration at entry level as well as for experience persons.

[12]https://www.bls.gov/ooh/installation-maintenance-and-repair/automotive-service-technicians-and-mechanics.htm

8.0 Learners' Guides on Competency Based Training

8.1 Overview

To facilitate uniform guidance for trainees, the CBT curriculum facilitates the development of a Learner Guide on Competency-Based Training. When searching for Learner guides in the internet, one can observe that many academic institutions prepare different versions of learner guides. Some of them cover all details from enrollment to completion of courses. As the purpose of a learner guide here is to facilitate competency-based training, it will focus on the development of competencies and assessments. The learner guide is prepared for NVQ Levels 1 – 4 courses and it gives steps for each task of the curriculum outline.

8.2 Guidance on How to Write Steps of a Task

i. Provide a brief introduction that explains the purpose and objectives of the practical work.

ii. Provide clear, concise, and precise instructions that anyone could follow to complete the task.

iii. Number the steps to make it easy for the trainees to follow alone. Each step should be short and to the point, and should indicate what actions need to be taken.

iv. Be specific and use direct language (Not Passive).

v. If the practical work involves any potential safety hazards, be sure to include clear instructions on how to stay safe.

vi. Each step should be small to enable the learner to understand it well.

The format for the performance guide is given below

Box 9 : Format for Performance Guide in the Learner Guide

Date Approved: / /

Module Title

Date to be revised: / /

Module Code

Task No :

Introduction to Activity /Task

Instructions:

• Use this performance guide when carrying out work

• If you have carried out the task successfully, all steps are given here (other than "Not Applicable steps" (N/A)) should be marked "Yes"

• If any step is inapplicable, please mark it with "N/A"

Serial Number	Steps	Performed		
		Yes	No	N/A

Reflection and self-assessment

Doing the work does not ensure the learning of the work. Thinking about the work done will ensure learning. Therefore, it is necessary to include some reflective questions with a self-assessment focus.

Have you achieved the desired result?

If yes, why it was possible?

If not, where it went wrong?

Are your measurements correct?

How could you further improve the performance?

Include work-specific questions too.

Some questions for assessments

What?

Why?

How?

It is necessary to prepare steps in tabular form for each task in each module. Each module has about 5 to 10 tasks. According to the current practices, learner guides are prepared for each module. However, what is written in NCS and curriculum should not be repeated in the Learner guide.

8.2.1 Laboratory sheets (NVQ Levels 5 & 6 Courses)

NVQ Levels 5 & 6 courses do not have tasks /activity-based practices and therefore, they do not have a performance (step) guide. Instead, they have laboratory worksheets and assignments and trainers will provide them with relevant information.

9.0 Trainer's Guide on Competency Based Training

The trainer guide is a document that can be used for implementing the CBT curriculum. As such both the curriculum outline and the learner guide focus on the tasks and standards of performance while the trainers' guide focuses on the training delivery and competency assessment.

9.1 Trainer's Guide Format and Sections

i. Introduction – Explain the content and how to use it to improve the training delivery

ii. Overview of the training programme : this section should provide an overview of the training program and its objectives, as well as any prerequisites or requirements for participants

iii. Introduction of the relevant document

   a. NVQ Operation Manual

   b. Relevant NCS

   c. CBT Curriculum and Learner Guide

   d. Accreditation Manual

   e. Relevant Circulars

   f. Code of Ethics for Assessors

iv. Training delivery under the CBT

Trainers should be made aware of the CBT concept and the need of providing opportunities for sufficient practice to make trainees competent. Any formal training becomes structured and then they become time-based where slow learners face difficulties keeping pace with fast learners. It is difficult for trainers to repeat lessons again and again for slow learners. Therefore, under the structured CBT, peer learning should be promoted and fast learners could be encouraged to train slow learners to reach competency level during free periods.

- **Course Accreditation, Training Plan, and Lesson Plan**

Under the NVQ Framework, in order to award NVQs, TVEC Accreditation is a requirement for each course. It is recommended here to give guidance to trainers on how to refer the Accreditation guidelines and the TVEC website and relevant circulars on the accreditation process. As the training plan and lessons plans are very important documents for training delivery, they should be well explained in the Trainer Guide.

- **Training Plan**

Each course should have a training plan to ensure the delivery and completion of all modules timely. It is a module vs time plan which could be a table as presented below. Institutions may prepare it such a manner displaying institutional identity pictorially.

Box 10 : A Format for a Training Plan

Module	Week Number in the Course Duration										
Module 1	1	2	3	4. 5. 6							
Module 2											
Module 3											
Module !											
Module n											

N – Total number of modules

Course accreditation demands the delivery of courses according to the plan and therefore, Trainer has to keep records on training delivery indicating any deviations and adjustments in a log book or a Learning Management System if, available.

- **Identifying Lessons of a Module**
  - * One Module may have a number of lessons that could be identified through the following steps.
  - * Break down the content of the module into main topics or themes, skills, and knowledge areas.
  - * Once the main topics are identified determine the sequence in which they should be taught.
  - * Once the sequence is determined, break down each topic into individual lessons. Each lesson should focus on a specific aspect of the topic and should have a clear learning objective.
  - * Then prepare lesson plans for each lesson with the following information.

- **Lesson Plan**

All trainers should have plans for the delivery of training and that is called a lesson plan. The content of a lesson plan is listed below.

i. Title

ii. Lesson objectives

iii. Material/resource

iv. Lesson delivery – the trainer's role as well as the learner's role and time allocated

- Introduction and motivation
  - Reminding Continuity to prior lesson / activating prior knowledge
- Lesson Body – deliver content – have a strategy to keep their interest
- Lesson closure
  - Lesson reflection and assessment
  - Guidance for further study

A Lesson plan could be presented in tabular form too as shown below.

Box 11 : A Format for a Lesson Plan

Module Title	
Lesson Title	
Lesson Objective	What is leaner will achieve on completion of lesson
Lesson delivery time	

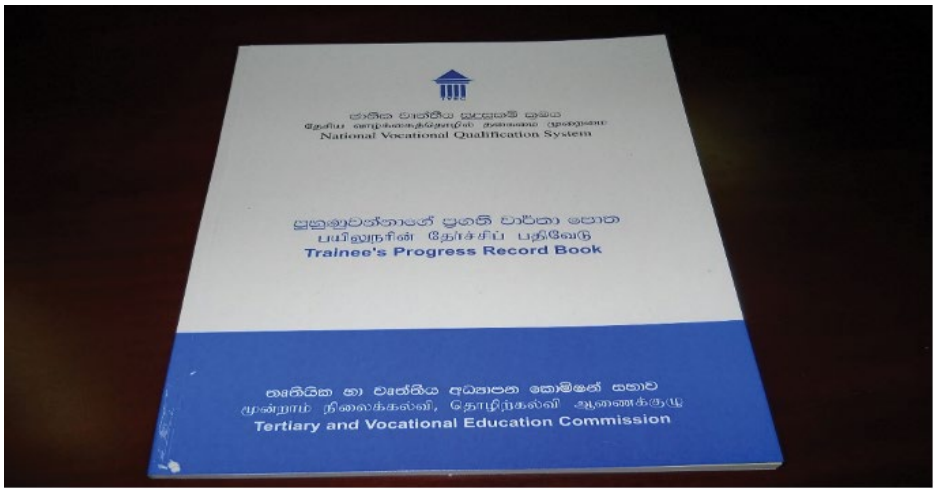
Training / Learning Activity	Role time of Trainer	Time duration	Role of Learner	Resources and Facilities Required	Total Time/ Duration
Introduction and motivation Lesson body Lesson Closure–Summary and further learning tips					
Assessment –a few assessment questions					
Wind Up – introduction/ preparation to next lessons					

In the trainer guide, a minimum of two model lesson plans could be provided in consultation with the Accreditation division of the TVEC.

9.2 Continuous Assessment

In CBT courses conducted under the NVQ Framework, continuous assessment of competencies is an essential activity to ensure that each module is completed with the development of relevant competencies. For that purpose, TVEC has introduced Trainee's Progress Record Book, and training centres have to arrange for all trainees to have and maintain this book to record continuous assessment results.

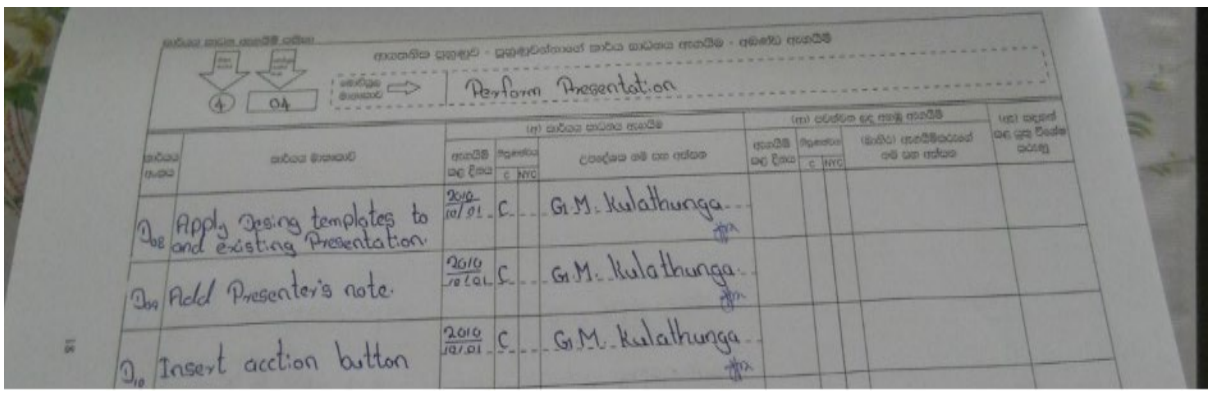
Figure 4 : Trainees' Progress Record Book



Source: TVEC

The learner guide has listed steps for all tasks/practical works identified for all learning outcomes. Trainers have to facilitate practice of all tasks by trainees and after sufficient practice, trainees should be given opportunities to demonstrate those tasks competencies independently. Then, if a trainee is competent, it is denoted by 'C'. If a trainee is not competent, it is indicated by 'NYC' as not yet competent. That information should be entered into Trainee's progress record book by filling in the relevant cells.

Box 12: Format for the Trainee's Progress Report



Task No	Task Title	Date of Assessment	Continuous Assessment			Random Assessment				Remarks
			Whether Competent		Trainer's Signature	Date of Assessment	Whether Competent		Name and Signature of an External Assessor/ Trainer	
			Y	NYC			Y	NYC		

In case, a trainee is not yet competent, he/she should be given opportunities for further practice during free time. If the trainer of the course is not available, weak trainees could do practices under the supervision of peers who are fast learners in the course. From time to time, at least once a month, a random assessment should be conducted on randomly selected tasks by an external assessor. In case of difficulties to get the services of an assessor for continuous assessment, get the services of a trainer in the same trade to do the random assessment.

9.3 Preparation of Laboratory Sheets for NVQ Levels 5 & 6 Courses

The learner guide has explained the need for a Guide for Laboratory experiments and workshop practices for NVQ levels 5 & 6 courses. It is the Learner Guide for NVQ levels 5 & 6 courses. As all Laboratory equipment among training centres are not similar/uniform, it may be difficult to develop practical sheets centrally. Therefore, Trainers have to prepare lab sheets for his /her laboratory.

Each lab assignment sheet may consist of the following information and trainers may add more information, if required.

i. Title:

ii. Objective: what is the learning objective

iii. Overview: A brief overview of what the experiment assignment is about. Explain the procedure of the experiment.

iv. Equipment and material – List the equipment and material required.

v. Observations – Explain the readings and observations to be made.

vi. Analyses: Explain the calculations and tabulations expected.

vii. Conclusion

9.4 Visits to Industry and Flagship Training Centres

Many training centres may not have some facilities specified in the relevant CBT Curriculum. Then the trainer will have to arrange visits to relevant training centres and industries to facilitate trainees to cover competency areas not available in his /her training centre. During the visits, trainees will be able to observe the performance of machines and processing plants, but they may not get opportunities for hands-on practices for sufficient time. Even without hands-on practice, trainees should have a strong cognitive grasp of the process. Therefore, trainees should be given an assignment (individual or group) to prepare a report on industry visits and they should be taken for discussion in the classroom and do an evaluation.

The trainers introduce the following format for trainees, if necessary, with appropriate revision to prepare the report.

i. Title of the Visit

ii. Date of Visit

iii. Who guided the Visit; Name Trainers/teachers who guided you for and during the visit

iv. Places visited

v. Key Officials met

vi. Key equipment and operations observed

vii. Curriculum modules relevant to the above observations

viii. What are the key learning points?

ix. (This could be written in the Daily Diary or a separate report could be written)

9.5 Facilitate Trainees to Learn Soft Skills

Many curricula have soft skills named as Basic Modules (NVQ Levels 1-4) and Employability Modules (NVQ Levels 5 & 6). The timetables of NVQ Levels 5 & 6 courses have training hours allocated for Employability modules. But, NVQ Levels 1 – 4 courses are overloaded with technical modules and therefore those courses have no time allocation for basic modules. Soft skills modules such as teamwork, communication, literacy, and numeracy are expected to be covered concurrently with other modules. For example, literacy and numeracy, teamwork, and communication could be addressed while training for technical modules. Learning soft skills could be provided through extra-curricular activities such as sports meets, New Year celebrations, annual trips, and religious celebrations organized in training centres. Participation in extra-curricular activities alone does not ensure learning. To facilitate learners to have a reflection or deep thinking, they have to write a report on their learning of relevant modules in respective events. The curriculum outline section of this manual has explained how to structure the learning from events with the following steps.

i. Orientation – Introduce soft skills units and modules with relevant skills 3 – 5 days before the events. In the case of teamwork modules, introduce teamwork skills. It is better if a handout is issued in the mother tongue.

ii. Participate in Events

iii. Discuss about trainees' experience in respective soft skills during the events.

iv. Trainees are required to write a report and submit it.

Trainers could introduce an appropriate format for this report.

Small training centres may not have the facilities to organize annual events. Those trainees may participate in annual events such as New Year celebrations in their villages. Trainers in small training centres could guide their trainees to have soft skills experience in events outside their training centres.

9.6 On the job Training

All vocational training courses need on-the-job training with relevant works to complete the 4th step of the skills development cycle listed below.

i. Unconscious Incompetency

ii. Conscious Incompetency

iii. Conscious Competency

iv. Unconscious Competency

On-the-Job training is compulsory for trainees in NVQ Level 4 courses however, it is useful for NVQ Levels 2 and 3 trainees as well. NAITA has the mandate to facilitate the OJT and accordingly, they facilitate OJT for NVQ level 4 and above courses. NAITA finds training places, conduct one day OJT awareness programme, provide daily diaries to be filled by trainees, and do monitoring of trainees in the field. As NAITA handles the bulk of trainees, some trainees may not get the full attention of NAITA officers. Therefore, Trainers of training courses have the role to coordinate with NAITA officers to make sure any trainee does not miss OJT. Alternatively, training centres themselves place trainees for OJT in NVQ level 4 which is also acceptable.

Training centres have to arrange OJT or job placements for NVQ levels 2 & 3 trainees. Therefore, Trainers have to coordinate that programme with relevant officers and industries and make sure NVQ level 3 trainees do not miss OJT or job placements.

9.7 Prepare Trainees for the Final Assessment

The Trainer Guide should give information on the following subjects to enable trainers to give guidance to their trainees.

i. For the final assessment, trainees should have completed and duly signed Trainee's Progress Record Book. NVQ Level 4 trainees should have completed their daily diaries during on the job training.

ii. Importance of appearing for NVQ assessment and obtaining NVQ certificates as some trainees after reporting for OJT do not come for assessments.

iii. Online scheduling of pre-assessment and final assessment procedures with relevant circulars.

iv. Explain about knowledge assessment for NVQ Level 3 and NVQ Level 4 qualifications.

v. Give references to relevant circulars.

vi. Explain to them how to refer TVEC website to get assessment details.

vii. Explain about Record of Achievement, a certificate for partial completion of competencies for full qualification.

viii. Trainees in NVQ Level 3 courses should be explained how they could get prepared for NVQ Level 4 assessment during employment.

9.8 Establish a Social Media Network with Trainees

All trainers may develop a social media network with trainees and share training delivery-related activities during the course enabling tracking them during OJT and organizing assessments. It makes sense to maintain these social media networks at least for one year after completion of the course and tracks their employment and maintains an employment register of trainees for each batch.

10.0 Assessment Guide

10.1 Introduction

Assessment is a critical TVET function because any error in assessment cannot be corrected later on. Weaknesses in training could be corrected through tuition, self-learning or repeat assessment. But, no correction could be done if any unskilled person get through an assessment. Assessment is the TVET exit point and gateway to the industry and assessors would be the gate keepers who are supposed to allow only skilled people get in to the industry.

NCS and curricula are developed by dissecting occupations. Then Assessment should be the integration of those components and therefore, it should embrace all types of competencies and all aspects of workplace performance.

This assessment guide outlines competency based assessment principles, guidelines of development of assessment resources and guidelines for viva-voce of NVQ level 5 & 6 assessment.

10.2 Purpose of NVQ Assessment

NVQ Assessments (Final/Summative) are conducted with following objectives.

- Identify candidates whose performance meets the competency criteria relevant to all the competency units of a qualification and recommend them for NVQ certification.
- When a candidate is successful only in a few competency units of a qualification, he/she could be issued a Record of Achievement (ROA) certificate.
- At the end of the assessment, Assessors have to give feedback to candidates enabling them to rectify their weaknesses.

10.3 Assessment Pathways

There are three pathways for NVQ assessment, namely;

- CBT Pathway - Trainees on successful completion of accredited CBT programme would be eligible for NVQ assessment
- EBT Pathway – NAITA apprentices on successful completion of accredited enterprise based apprenticeship programme would be eligible for NVQ assessment
- RPL Pathway – This particular pathway is to recognize prior learning acquired by Industry employees who have sufficient experience as per the relevant NVQ circular issued by the TVEC.`

10.4 Who could conduct NVQ Assessment?

CBT Assessors should be subject experts who have followed assessor training conducted by the UOVT/TVEC and registered with TVEC. His/her name should appear in the Assessor Registry of the TVEC website in black colour.

A Person who completes the assessor training has to work as a trainee assessor for some time and until such time, his/her name appears in blue. TVEC website on assessor registration gives full details.

There are two categories of assessors; NVQ Level 1-4 assessors and NVQ Levels 5 & 6 Assessors. Two categories have two separate training programmes and registration. An Assessment is always conducted by a panel of two assessors to facilitate expertise in a wider area and collective judgment. TVEC has an online facility for the appointment of assessors and Assessors are expected to check NCQ circulars on the TVEC website regularly to get TVEC instructions and guidelines on assessments.

As Assessor training is conducted periodically, Registered Assessors may not be available in new NCS and curricula. Then, TVEC will assign an occupational expert preferably a member of the relevant NCS development committee, and an experienced assessor from another occupation to do the assessment.

Assessors with a conflict of interest such as a pre-established personal relationship with a candidate should not undertake such assessment. NVQ Assessors' codes of ethics give full details of guidelines for Assessors.

10.5 Assessment Venues

There are three types of assessment venues.

a. Training centers with accredited training courses relevant to the assessment.

b. EBT Centers – These are Enterprises where Enterprise Based Training or apprenticeship training is conduced and award NVQs with the approval of the TVEC

c. Assessment Centers – Assessment centers approved by the TVEC to do especially RPL assessments

10.6 Principles of CBT Assessment

The assessment principles require that the assessment is valid, reliable, flexible, and fair.

i. **Validity**

- Assessment of a competency unit should have addressed relevant elements, performance criteria and critical aspects.
- Assessment outcome should have coverage of all dimensions of competency and be fully supported by the evidence gathered
- Assessment should have been conducted by a properly appointed panel of two registered assessors
- Assessment should have been conducted in a venue accredited for relevant training/ assessment.
- Assessment tasks should resemble to those encountered in workplaces
- The assessment covers the range of competencies

ii. **Reliability**

- Assessment judgment should be independent of the assessor, assessment venue and assessment time
- The assessment system would be reliable if assessors in different locations make the same judgment about the same candidates based on the same set of evidence.

iii. **Flexibility**

Flexibility refers to the reasonable adjustment of processes, procedures, and administration to suit different contexts and the need of candidates without compromising the competency level of the qualification

It is expected that a high degree of transparency shall be maintained in assessments and make candidates aware of how they will be assessed, when and by whom, and what the expected performance and relevant competency Standards are.

iv. **Fairness**

Fairness means that assessment methods and processes do not create unreasonable situations for any candidate. An assessment should not place unnecessary demands on learners that may prevent a candidate from demonstrating competence. For example, an assessment should not demand the handling of heavy hand tools if NCS has not specifically stated it.

It is expected that equity principles are well maintained in NVQ Assessments. It should be independent of gender, place of learning, place of work and social status, etc.

10.7 Assessment Methods

i. **Criterion-Based Assessment**

NVQ Assessments are criterion-based assessments. It means that assessments are done against pre-determined criteria. Under NVQF, assessments are conducted against performance criteria specified in relevant NCS. Persons who meet these criteria are awarded the relevant qualifications.

The opposite of this is the Norm Based assessment where candidates are assessed against their peer group. (https://www.renaissance.com/2018/07/11/blog-criterion-referenced-tests-norm-referenced-tests/, 28.11.2021)

ii. **Evidence-Based Assessment**

Assessment is a process of collecting evidences on relevant performance and making judgments on competency.

There are different types of evidences on performance.

- Direct evidences
  - Direct observation of performance/ Demonstration of specific skills
  - Oral questioning
  - Product produced
  - Video of work
- Indirect Evidences
  - Review of previous work carried out
  - Written test done previously
  - Training records
  - Trophies and awards

- Supplementary Evidence
  - Third party recommendation / letters / testimonial
  - Reports from Supervisors

10.8 Rule for Evidences

Assessment judgment should be based on valid, sufficient, current and authentic evidences.

i. **Validity**

Evidences should be directly related to relevant performance criterion.

ii. **Sufficiency**

Evidences are related competency over a period of time duration.

All dimensions of competency are addressed.

Competency applications in different context should be demonstrated.

iii. **Current**

Evidences show that candidate's competencies are current and recent.

This is very important regarding RPL candidates.

iv. **Authentic**

It should be verified that the evidences are based on the candidate's own performance.

10.9 Assessment Tools

Assessors should be very familiar with and use the following assessment tools

- Relevant National Competency Standard (NCS)

Assessment should be conducted on competency units of relevant qualification packages and against the performance criteria and critical aspects specified there. Further, Underpinning knowledge and skills should be taken into consideration.

- Relevant CBT Curriculum

Most underpinning knowledge and skills have modules in curricula. It is useful for assessors to refer to relevant curricula to get a broader understanding about the underpinning knowledge and skills.

- Assessment Resources

Some competency based training material packages have assessment resources which include;

  * Evidence Matrix
  * Practical exercises
  * Performance Checklist
  * Guide for questioning

- Assessment Interviews- viva-voce (NVQ level 5 &6).

  a. Self–Assessment for RPL candidates.

10.10 Development of Assessment Resources

As specified in the NVQ Operations Manual – 2021, it is expected to develop the following assessment resources for each competency unit of each NCS and compile them as a booklet.

i. **Compulsory Evidences on Prior work experiences**

Some NCS have competency units which cannot be assessed in training centres. Some of them may have further constraints to organize practical in workplaces due to technology and cost constrains. Some practical cannot be simulated or artificially created.

When a NCS has such competency units, candidates should be advised to experience those competencies previously and produce evidences such as photograph and video with testimonials to authenticate those experience.

ii. **Evidence Matrix for Unit**

In CBT assessments, there are 16 types of potential evidences and evidence matrix marks relevant evidences against each competency element. In case evidences such as photographs, vides and certificates are produced, they should be verified thorough oral questioning.

Box 13 : Evidence Matrix for Assessment

Evidence Matrix for CBT Assessment																	
Occupations																	
Unit Title																	
Code																	
	Evidences																
	Performance Criteria Number	WT-Knowledge assessment, orally or Written tests	Practical tests	OW= Observation at work	OQ= Oral Question	Tr. R/Lb= Trainee's record book / Log book.			C= Certificates	T= Testimonies	VD - Videos on performance	P= Photographs	PP= Product produced	S - Simulations	CS= Case Studies	FB= Feed Back from Fellow Members	Role Play
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Element 1	1.1																
	1.2																
	1.3																
	1.4																
Element 2	1.1																
	1.2																
	1.3																
Element 3	1.1																
	1.2																
	1.3																
	1.4																
Element 4	1.1																
	1.2																
	1.3																
	1.4																

Cells relevant to an element and performance criteria in above matrix could be marked with "√" symbol if it has potential evidence row at the top.

Assessors have to follow the above matrix to check relevant evidences on skills of candidates.

iii. Practical Exercise or Workplace Observations

When submitted evidences are satisfactory, they should be verified with oral /written questions. If evidences are not satisfactory, best solution would be to observe the candidates' performance in workplaces. If that is also not practicable, a practical exercise (simulation) should be developed in an assessment venue to enable candidates to demonstrate their competencies.

If the evidences submitted are sufficient for all units except one, assessors have to give a practical for that unit only. Therefore, assessment resources should have model practical exercises for each unit. There are candidates who do not produce satisfactory evidences for all or majority of units, then there should be one practical exercise to include all competency units of qualifications. Steps to develop practical exercises are given below.

a. Title :

b. Relevant Competency unit/s

c. Overview: A brief overview of what the experiment assignment is about. Explain the expected outcome/performance.

d. Equipment and material – List the equipment and material required.

e. Diagram /drawing of equipment

f. Explain how final results are evaluated.

-Planning the activity (Follow holistic Assessment explained below)

-Product service provided

-Process

-Work habits

g. Conclusion :

iv. Holistic assessment

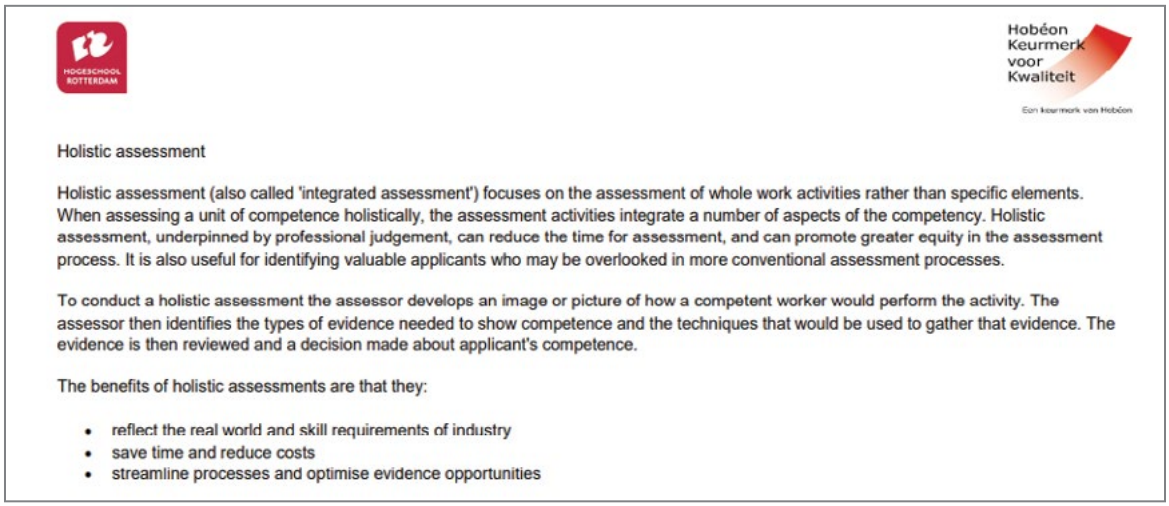
A competent performer in any complex problem should have relevant skills as well as the capacity to integrate those skills. Accordingly, a qualification could be written as a formula.

Qualification = Sum of Selected Unit + integrative component[13]

[13]John Hart, 2009,Developing a National System of Vocational Qualification by John Hart, International Handbook of Education for the Changing World of Work (UNEVOC)

Holistic assessment in vocational education is an approach to evaluating a student's skills, knowledge, and competence in a comprehensive and integrated manner. The capacity to integrate skills could be assessed based on a practical application of multiple skills simultaneously or else taking evidence of the application of multiple skills simultaneously. Therefore, unit-wise assessment and taking evidence on unit-wise skills should be strengthened with a focus on assessing the capacity to apply multiple skills simultaneously. An explanation of holistic assessment taken for the internet[14] is listed below.

Box 14 : Explanation of Holistic assessment



Holistic assessment

Holistic assessment (also called 'integrated assessment') focuses on the assessment of whole work activities rather than specific elements. When assessing a unit of competence holistically, the assessment activities integrate a number of aspects of the competency. Holistic assessment, underpinned by professional judgement, can reduce the time for assessment, and can promote greater equity in the assessment process. It is also useful for identifying valuable applicants who may be overlooked in more conventional assessment processes.

To conduct a holistic assessment the assessor develops an image or picture of how a competent worker would perform the activity. The assessor then identifies the types of evidence needed to show competence and the techniques that would be used to gather that evidence. The evidence is then reviewed and a decision made about applicant's competence.

The benefits of holistic assessments are that they:

- reflect the real world and skill requirements of industry
- save time and reduce costs
- streamline processes and optimise evidence opportunities

In unit-wise assessment, every performance criterion needs to be assessed. In holistic assessment, assessment judgments are based on overall or holistic performance and therefore assessment could be completed in a shorter time.

v. Guide for Holistic Assessment of Practical Exercises

CBT assessment is a holistic assessment. If performance is holistically satisfactory, weaknesses in one or two performance criteria except for critical aspects and standards

(ISO, SLS, IEE etc) should not be counted. Following guide should be used to assess the practical holistically.

Box 15 : Guide for Holistic Assessment

1	Unit of Competency			
2	Candidate's Name			
3	Workplace /address			
4	Date of Assessment			
5	Instructions			
	Mark in whether satisfactorily performed	Yes	No	Comments
Planning				

[14]https://www.hogeschoolrotterdam.nl/contentassets/3b09df67581e4ac79bc11af410d6d11e/03-artikel-holistic-assessment.pdf

a	Selection of tools material and equipment			
b	Approach to work			
c	Operational sequence			
d	Use of appropriate techniques			
Product manufactured / Service provided				
a	Performance /Taste			
b	Workmanship			
c	Finish			
d	Presentation			
Process				
	Include relevant performance criteria			
Work Habits				
a	Safety (Self, equipment and others)			
b	Careful handling of equipment and material, minimal wastage			
c	Cleanliness (workplace, Self)			
d	Attitude (toward fellow mates, assessors and other staff)			
Critical aspects to be assessed				
Standards to be maintained (ISO, SLS, IEE Regulation etc.)				

vi. **Criteria for Development of Oral / written Questions for competency units**

Oral and written questions are used to verify the authenticity of evidence and address the gaps in knowledge and understanding of practical exercises

Box 16 : A Guide for Oral/written Questions

Competency Standards				
Competency Unit				
Unit Code				
Question No	**Questions**	**Response Satisfactory?**		
		Yes	**No**	**N/A**

N/A – Not applicable

vii. Criteria for development of questions

The questions should be directly related to the specific knowledge, skills or abilities that assessment aims to measure.

The questions should be clear, concise, and easily understandable by the individuals being assessed.

The questions should be designed to probe the candidate's understanding of the competency being assessed. For NVQ level 3 candidates, questions with short answer or 'yes' and 'no' answer may be sufficient. For NVQ level 4, 5 and 6, deeper knowledge could be expected with open ended questions.

Please give answer list also for information of the assessors.

viii. Criteria for development of multiple-choice questions

Multiple choice questions are good assessment tools to test a candidate in a wider area in shorter time. But they should be properly designed to be effective.

A multiple-choice question (MCQ) is composed of two parts: a stem (trunk) that identifies the question or problem, and a set of alternatives or possible answers that contain a key that is the best answer to the question, and several distractors that are plausible but incorrect answers to the question.

a. Firstly, be very clear about objectives, to test the knowledge or gaps in evidence and practical performance.

b. Identify the areas for questioning.

c. Writing multiple-choice-questions takes time, therefore prepare them before coming to the final assessment.

d. When designing questions, prepare the question to enable a candidate to give an own answer. If this is possible question is right.

e. Then give 4 options with one right / best answer and three should look like right but wrong answers. Ask candidates to choose the best answers, not the correct answer.

f. Do not ask negative questions because candidates lose sense of negativity while speeding answering.

g. Use simple language free of technical jargon.

ix. Assessment of Underpinning Knowledge and Skills

NCS do not have further information about underpinning knowledge and skills. But curriculum has developed modules for underpinning skills and knowledge. The Assessors have to get guidance from the relevant curriculum to assess these underpinning knowledge and skills.

Box 17 : List of Underpinning knowledge and relevant Module

Underpinning knowledge of the competency units	Relevant Modules in CBT Curricula

x. **Guide for Setting Question Papers for NVQ level 5 & 6 semesters written examination**

Each semester has a learning content of 30 credits. Therefore, one question paper could cover about 5 or 6 credits and a total of 5 or 6 question papers may be prepared. In the case of competency units of 2 or 3 credits or modules of shorter duration could be combined into one question paper.

xi. **Guide for NVQ level 5 &6 Assessment Interview/ viva-voce**

i. Objectives of the NVQ Level 5 &6 Assessment Interview

NVQ Level 5 & 6 trainees who have completed the semester examinations, all related practical/ course work, and on-the-job training will have to appear for the assessment interviews/viva voce.

a. This is a measure of quality assurance for their learning process

b. Check whether they have produced authentic reports

c. Assess critical aspects of performance specified in NCS

d. Assess employability skills through questioning

ii. Interview Panel : Two NVQ Level 5 &6 Assessors

Material to be provided to the interviews panel

a. Assignments / designs /course-work done during course

b. Trainee's progress record book and training log/Daily diary of the On the Job training.

c. Question and answer papers of trainees in most recent semester.

d. Procedure

e. Check the seating arrangement

f. If whole group is present, do a briefing about the assessment. Create friendly environment so that trainees do not have a fear to appear for assessment.

g. Give a time schedule for trainees as they need not the wait in a long queue.

h. Do the best to put candidates at ease.

i. Candidates have already passed examinations and completed assignment/ course work and OJT and they must be competent diploma holders.

j. Select one question with passed marks from each question paper and check whether candidates still demonstrate that knowledge.

k. Check whether candidates are well knowledgeable about coursework and assignments

l. Check whether candidates have acquired relevant competencies during OJT.

xii. **Self – Assessment for RPL candidates**

Self-assessment is useful for any candidate to know his/her strengths and weaknesses and get ready for the assessment by registered assessors. They should be given a check list of performance criteria relevant to the qualification in an appropriate reader friendly jargon.

Box 18 : Self-Assessment Form for RPL Candidates

Qualification			
Unit of Competency			
Instruction	Read each question in left had column Place a tick in the appropriate box opposite each question to indicate your skills.		
	Can I do?	Yes	No
1	Competency element		
a	Performance Criteria		
b	Performance Criteria		
c	Performance Criteria		
2	Competency element		
a	Performance Criteria		
b	Performance Criteria		
c	Performance Criteria		
	(Performance criteria may be re-written in reader friendly jargon)		

10.11 Assessment Judgment

In CBT assessments, there are 16 types of potential evidences and evidence matrix marks relevant evidences against each competency element. In case evidences such as photographs, vides and certificates are produced, they should be verified thorough oral questioning.

- In knowledge assessment, minimum pass marks shall be 50% and in competency/psychomotor assessment, candidate should demonstrate the ability to perform all the tasks relevant to competencies specified in relevant National Competency Standards.
- In formative competency assessment, judgment shall be recorded as 'Competent" or "Not Yet Competent" against each task in Trainee's Progress Record Book with respect to competencies(expected standards of tasks)indicated in curriculum modules.
- In summative (holistic) Competency assessment, judgment shall be recorded as 'Competent" or "Not Yet Competent" against each performance criterion /expected performance standards in the Assessment Record Book/form) with respect to Elements of Job Function (Competency elements).

11.0

Compile Competency Units/ Job Functions and Modules to Finalize NCSs and Curricula

At present, NCSs and curricula are compiled together and the Learner Guides (Module wise) and the Trainer Guide are compiled as separate documents. TVEC, NAITA, and UoVT have collectively introduced a format to be followed in the preparation of these documents. Developers have to follow that format for the NCS and Curriculum.

12.0

Validation of NCSs and Curricula

The final draft NCS and curriculum shall be validated by the NITAC members, who consider the following issues.

a. Appropriateness of Title /Name of the NCS.

Check each competency unit for the title, element, performance standards, Range statement, critical aspects, the relevance of standards specified, material and equipment, and underpinning knowledge and skills are presented as per the guidance in the Manual on NCSs and Curricula

b. Relevance of qualification packages and their levels to available jobs.

c. Check language inaccuracies.

It is necessary to fill the format for validation of NCS given in Annexure 3 and get it signed by the NITAC committee members.

After incorporating revisions proposed at the validation meetings, NAITA will send the document to Director (NVQ), TVEC with the validation reports prepared by the facilitator based on the format given in annexure 3.

13.0 Role of NITAC Members

The National Industrial Training Advisory Committee (NITAC) is the advisory committee appointed by NAITA for respective industry sectors for industry consultation on training issues. It performs the validation of the NCS and curriculum developed under the NVQ Framework. The membership of NITAC as specified in the NVQ Operation Manual – 2021 is given below.

Box 19 : Membership of the National Industrial Training Advisory Committee

As a minimum, each NITAC includes:

- 5 members with wide experience in occupations within the industry sector, who are current practitioners (at least sixty percent of these members should be from industry).
- One representative from a trade union (To be nominated by the Ministry of Labour, if required).
- One representative from the Ministry of Labour.
- 5 representatives from private and public training providers (one each from VTA, NAITA, DTET, NYSC and a private training institution as appropriate).
- One representative from UNIVOTEC.
- One representative from the Ministry of Public Administration (if required)
- One representative from NAITA who will act as the NITAC executive officer.
- One representative from the TVEC

Each NITAC will appoint a chairperson from among the members who are industry practitioners.

Source : NVQ Operation Manual – 2021

Role of NITAC members in validation of NCSs and Curricula

All members of the NITAC have a difinite role to play in developing an industry relevant NCSs and curricula as per the Term of Reference given in Box 20. The specific duties they have to perform in respect of development of NCSs, Curricula and assessment material are listed out below.

Role of Industry Representatives

- Give details about the nature of the work of occupation concerned
- Explain about work performed in workplaces under relevant occupation
- Name the jobs/employment practices in workplaces
- Educate the team on future trends of technological development including past, prevailing & emerging standards/ codes of practices
- Provide industry relevant information required for relevant NCS and Curriculum

Role of the Labour Ministry Representative

- Explain about safety and ergonomics issues
- Guide the team and facilitate to avoid any conflict with other occupations and wage board practices.
- Explain about minimum facilities necessary for the worker to perform well in workplace

Role of the Trade Union Representative

- Explain the requirements to avoid any conflict with the current labour force practices and trade union practices

Role of the TVEC Representative

- Study in advance other relevant NCSs already developed and avoid any conflict with their content
- Study relevant labour market trends, get the details from the newspaper survey and Labour Market Bulletin of TVEC
- Set the coding for NCSs and Curricula in consultation with the Director (NVQ)
- Submit a report of the progress of validation with issues faced to the Director(NVQ) within two working days after each meeting
- Explore websites and be knowledgeable about the occupation and practices in other countries before the validation
- Explore the possibility of importing and adopting units from the Unit Bank of TVEC
- Ensure NCSs and curricula comply with the guidelines specified in the NVQ Operation Manual – 2021 and NCSs and Curricula Development Manual – 2023

Role of the NAITA Representative as the NITAC Executive Officer

- Assist NAITA in appointing an appropriate expert team to NITAC and do necessary communication
- Get appointed a competent facilitator and recorder and give intoduction to the development group.
- Keep track on the work of the development group and guide the facilitator on the possibility of importing and adopting units from previous NCS
- Organize logistics for the development group and NITAC
- At the commencement of validation, give an introduction to the committee members to educate them on the process
- Time management and control budget

Role of the UOVT Representative

- Should study other relevant NCSs and curricula already developed and avoid any conflict with their content and learning time
- Check the horizontal and vertical articulation possibilities of the qualification
- Submit a report of the progress of validation with issues faced to the Head of curriculum development in UOVT within two working days after each meeting
- Explore websites and be knowledgeable about the occupation and work practices of other countries before the validation
- Explore the possibility of importing and adopting modules from other curricula
- Check credit transfer possibilities in higher education

Box 20 : The Terms of Reference of the NITAC

The terms of reference for NITACs are as follows:

- Assist NAITA in identifying suitable practitioners to take part in competency standards development and the development of assessment materials.
- Undertake technical validation of competency standards prepared for TVEC endorsement after wide circulation to industry and the public.
- Recommend competency standards to the TVEC for endorsement.
- Recommend assessment materials to the TVEC for endorsement.
- Consider industry comments on the continuing validity of competency standards and assessment materials.
- Assist NAITA in the review of competency standards and assessment materials.
- Assist NAITA in identifying work placements for trainees.
- Facilitate the provision to NAITA of technical advice in their occupations on various matters as and when requested by NAITA.

14.0

Coding of NCSs and CBT Curricula

The TVEC representative of the NITAC has to determine the coding of proposed NCS in consultation of with the Director (NVQ) and present it to the NITAC validation meeting.

According to the current system of coding, the first three characters of a code are based on the industry sector which is identified by the International Standards Classification of Industry (ISCI). Here, codes of other relevant NCSs also should be taken into consideration.

The fourth character is used to differentiate two categories of NCSs; NVQ Levels 5 &6 NCSs and NVQ Levels 1- 4 NCSs. As NVQ levels 5 & 6 NCSs are developed for the Technology management level, the letter 'T' is used as the fourth character. As NVQ levels 1 to 4 NCSs are developed for skills, the letter 'S' is used as the fourth character. Thereafter, there is a serial number of three digits.

15.0 Endorsement

After validation by the NITAC, the NAITA will submit the NCSs and curricula to TVEC with the validation reports. The Director (NVQ) submits the validated document with the checklists specified in the procedure of endorsement given in Annexure 4. The NDMC in turn will check validated reports and make recommendations for endorsement with or without revisions. The Director ((NVQ) in turn gets the Commission approval to publish them as National NCS and Curriculum.

16.0

Revision of NCSs and CBT Curricula

NCSs and curricula are developed in consultation with industry sector experts and training experts by analyzing current applications of skills, use of technology, and work practices. However, due to changes in labor market and workplace practices, and technological advancement, periodical revision of these NCSs and CBT curricula is a must. Therefore, each NCS has a fixed period of validity and a date for revision.

Though NCSs and curricula are developed by groups of experts and validated by another committee of experts, these may have some shortcomings. But, such shortcomings may not have been noticed in the beginning. These will come to the surface soon with the implementation of NCSs and curricula. Therefore, there should be a mechanism to collect shortcomings experienced during implementation. If any critical problem such as the non-identification of a very essential competency unit is found, remedial actions should be taken immediately. In the past also, some NCSs and curricula had been revised immediately after launching.

At the middle of each year, the Director (NVQ) should identify the NCSs and curricula scheduled to expire in the next year. Those NCSs and curricula to be revised in the next year should be taken for discussion at the NVQ steering committee meeting and respective institutions should be given responsibility to collect information on revisions required from their training centres.

The NVQ Division of TVEC has to collect feedback from the private sector training centres and assessors. NAITA has to collect revision required from members of the development group and relevant NITAC and relevant employers in apprenticeship. The Feedbacks thus collected have to be summarized and presented to the NDMC to review. If any revision is not requested, NDMC could recommend the NCS to re- endorse without revision. If revisions are required, NDMC could assign revision work to NAITA or UOVT or any other institutions.

17.0

Institutional Roles for the Development and Revision of NCSs, CBT Curricula and Other NVQ Documents

The NVQ Operation Manual has assigned the development of NCSs and Curricula to TVEC, NAITA, and UOVT. They are collectively responsible for the promotion of NVQ qualifications with the following individual roles.

Box 21 : : Institutional Roles in Development of NCSs and Curricula

	Activity	Responsible Institutions
I	Identification of Occupations/ Industry sectors for the development of NCSs and CBT Curricula	TVEC, NAITA, UOVT
Ii	Approval of Identified Occupations/ Industry sectors for the development of NCSs and CBT Curricula	TVEC
iii	Appointment of NITAC for the respective industry sector	NAITA

	Activity	Responsible Institutions
Iv	Prepare an Annual Plan for timely revision and development of new NCSs and curricula and seek funds for development from the Treasury, Projects, and industry	TVEC, NAITA, and UOVT
V	Development and revision of NVQ levels1-4 NCSs and Curricula	NAITA and UOVT
vi	Development and revision of NVQ levels 5 & 6 NCSs and Curricula	NAITA and UOVT
vii	Develop a plan to implement training and RPL assessment of new NCSs and Curricula	TVEC, NAITA, and UOVT
viii	NCS and curriculum innovation to improve their effectiveness and shorten the time taken for development and revisions	TVEC, NAITA, and UOVT
Ix	Monitor the process of development of NCSs and Curricula including all the above activities	The Committee to Monitor the Development of NCSs and CBT Curricula.

18.0 Conclusion

TVEC, NAITA, and UOVT have developed NCSs and Curricula since the inception of the NVQ Framework in 2004. From time to time, many policy guidelines have been introduced to improve the development process of NCSs and curricula. This manual also explores some innovations to further improve the NCSs and curricula by capturing workplace realities in the application of competencies. Therefore, this manual, upon implementation may need to revise and update as per changing work practices of industry.

Annexures

Annexure 1 : Format for Submission of Proposals for the Development of a New NCS and Curriculum

1. Background

- Name of the applicant ……..
- Institute …….
- Contact detail
  - * Telephone**:** .....
  - * e–mail**:** …….
  - * Fax **:** ……
- Related sector ……..
- Related sub-sector : ……
- Related job titles : ……
- Purpose of developing the Proposed qualification (Explain why this qualification is needed)
- Employment Opportunities
  - * Local Employment
  - * Foreign Employment

2.

- Relevant courses available in your institution, Yes ☐ No ☐
- If Course available,

i. The number of training centres/courses ……

ii. No of the students passed out ……..

- Relevant curriculum available for the course, Yes ☐ No ☐
- Fund availability to develop NCS (
- Target group (Please mark " √" as appropriately)
  - School leavers ☐
  - Industry practitioners ☐
  - Retired persons ☐
  - Any other/specify ☐
- Brief description of the target group (Age, Education, Background, etc..)

……..

Date…..... Signature…….

Annexure 2 : Terms of Reference for the Committee to Monitor Development of NCS and Curricula

The TVEC, the apex body of the TVET sector has appointed a committee of the following members to monitor the development of NCS and CBT curricula under the NVQ Framework.

1. Deputy Director General, TVEC
2. Director (Quality) NAITA
3. Director (IS), TVEC
4. Director (P & R), TVEC
5. Director (NVQ), TVEC
6. Director/ Senior Lecturer responsible for Curriculum Development at UOVT
7. Assistant Director (Quality) of NAITA
8. Assistant Director (NVQ), TVEC – convener

Terms of reference of the above committee are listed below.

a. Identify occupations for the development of new NCS and Curricula

b. Evaluate proposals for the development of new NCS and curricula and make recommendations

c. Assign development works to relevant institutions and outsource the work if required

d. Conduct monthly meetings to monitor the development and revision of NCS, curricula, and related documents

e. Develop and monitor action plans for implementation of training and RPL assessments in New NCS and curricula

f. Review development processes and make recommendations for revision of processes if required.

Annexure 3: Validation Report From NAITA

National Apprentice & Industrial Training Authority

NAITA Feedback form on NCS and Curriculum Development

(Completed by Facilitators at the end of each validation with the comments of NITAC members)

Validation of Competency Standard for the Occupation/Sector of ……...

Please respond to all the items and provide additional comments as appropriate.

1. Unit Title and Code: ……

1.1. Does the unit title focus on the outcomes of the job? Yes ☐ No ☐

1.2. If the answer for 1.1 is "NO", are you able to suggest any alternative unit title that may better describe the outcome of the job?

If yes, please suggest an alternative name. Yes ☐ No ☐

…….....

……...

1.3 Does the unit of competency match with the relevant competency area/s in the competency profile? Yes ☐ No ☐

…….....

……...

2. Unit descriptor

2.1. Does the descriptor adequately describe the parameters of the job?

Please,Comment, Yes ☐ No ☐

…….....

……...

3. Elements of competence

3.1. Do the elements focus on the outcomes of the unit

Please, Comment; Yes ☐ No ☐

…….....

…….....

3.2 . If the available elements are not focus on the outcomes of the unit,suggest alternative element/s

……..... Yes ☐ No ☐

……...

4. Performance criteria

4.1. Are the performance criteria clear and easy to understand?

Please, comment; Yes ☐ No ☐

…….....

……...

4.2. Do the performance criteria sufficient to assess the element?

Please, comment; Yes ☐ No ☐

…….....

……...

5. Range Statement

5.1. Does the range statement identify adequately the contexts in which the work takes place? (Contexts may include workplace, which method use, performing unit manually or using machinery, individually or as a team, limitations, etc.),

Please, comment; Yes ☐ No ☐

…….....

……...

5.2. Does the range statement identify all the standards/regulations that affect the job?

Please ,comment; Yes ☐ No ☐

…….....

……...

5.3. Are required resources (Machineries, Equipment, Tools, and Materials) included in the list?

Please,comment; Yes ☐ No ☐

…….....

6. Assessment guide

6.1. Does the assessment guide identify all the critical aspects related to the unit, written clearly and in a logical order?

Please ,comment; Yes ☐ No ☐

……..

……..

6.2. Does the assessment guide identify the required underpinning skills and knowledge which are essential to the job?

Please ,comment; Yes ☐ No ☐

……..

……..

7. General

7.1 Will the unit of competencies be relevant across a range of enterprises in your occupation/ sector?

Please, comment;

……..

……..

7.2 Please make any other comments in order to help improve the Competency unit

……..

……..

Validity of the draft competency standard for ……..

In our judgment, the competency standards meet the requirements for practicing the occupation/ sector and can be used to develop curriculum and assessment resources for the relevant occupation/ sector. If not, please suggest improvements.

……..

……..

……

Annexure 4 : Check list for NCS and Curriculum Development/Revision- Level1-4

(Completed by facilitator at the end of validation and before send document to TVEC for endorsement)

Title of the NCS:

Code:

Level of the NCS: NVQ Level 03 & 04

(Please put tick mark (√) in relevant column)

Section	Component	Yes	No
Front page	Occupation Title		
	Developed by		
	Validated by		
	Endorsed by		
	Ministry name		
	Follow the NCS guideline given for font size and line spacing		
Copy write page	First Publication (Month & Year)		
	First Revision (Month & Year)		
	Next Revision (Month & Year)		
	Published by; Name, Tel.no., Email address, website (Current details)		
	Directed by- Ministry name (Current ministry)		
PREFACE page	Name of NAITA chairman (Present chairman)		
	Name of TVEC DG (Present DG)		
	Follow the NCS guideline given for font size and line spacing		
Acknowledgement (For new development)	**New**		
	Overall Direction (Names of present NAITA		
	chairman and DG TVEC)		
	Details of development and National Industrial Training Advisory Committee (NITAC) members		
	Details of Development Facilitator		
	Coordinator		
	Details of Validation Facilitator		
	Coordinator		
	Follow the NCS guideline given for font size and line spacing		

Section	Component	Yes	No
Acknowledgement (For revision)	**Revision**		
	Overall Direction (Names of present NAITA		
	chairman and DG TVEC)		
	Details of development and National Industrial Training Advisory Committee (NITAC) members		
	Details of Revision -Facilitator		
	-Coordinator		
	Details of Validation - Facilitator		
	-Coordinator		
	Follow the NCS guideline given for font size and line spacing		
Content Page	Description		
	Page No.		
	Follow the NCS guideline given for font size and line spacing		
Occupation Outlook	Job Description		
	Responsibilities		
	Career and Employment Opportunities		
	Work Environment		
	Salaries and remuneration		
Competency Standard –Unit page	Page Title (Name of the NCS, level/Levels, competency standard code)		
	List of Competency Units		
	Unit Code No.		
	Level		
	Page No		
	Packaging for National Vocational Qualifications (NVQ)		
	Follow the NCS guideline given for font size and line spacing		
Detail Unit	Unit Title:(Sentence Case)		
	Unit Descriptor:		
	Unit Code: (Standard code+ Unit no:)		
	Elements of Competence		
	Performance Criteria (without is /are)		
	Range Statement		
	Elaboration of Terms in Performance Criteria		
	Critical Aspects		
	The following tools and equipment are included within this unit		
	The following documents /References/Standards		
	may be used for this unit: if any		

Section	Component	Yes	No
	Underpinning Knowledge and Skills		
	Worker Behavior/Attitudes/Soft skills		
	Follow the NCS guideline given for font size and line spacing		
	Is this an occupation handled by a team?		
	If yes, to above, does it have Level 1, and 2 qualifications?		
Competency Based Training Curriculum page	Page Title (Name of the Curriculum, level/Levels, CBT Curriculum Code)		
	List of curriculum modules		
	Module code no:		
	Duration- Hours (Theory and Practical), Total Duration		
	Does durations have any conflict with other relevant curricula? (Eg. Motor Bicycle and three wheeler)		
	Page number		
	Follow the NCS guideline given for font size and line spacing		
Competency Profile (Title)	Competency Areas		
	Competencies		
	Name of the occupation		
	Follow the NCS guideline given for font size and line spacing		
Programme Structure (Title)	Competency Area		
	Module (No. and Title)		
	Competencies		
	Time-Institutional (Theory and Practical)		
	Follow the NCS guideline given for font size and line spacing		
Mapping Table (Title)	Qualifications		
	Relevant Units		
	Relevant Modules		
	Relevant Tasks		
	Follow the NCS guideline given for font size and line spacing		
	Module Title (Sentence Case)		
	Module Code (Standard code+ module no:)		
	Module Type		
	Duration (Hrs.)		
	Learning Outcomes		

Section	Component	Yes	No
Detail module	Learning Content (Theory and practical)		
	Teaching-Learning Activities		
	Forms of Assessment		
	Follow the NCS guideline given for font size and line spacing		
	Learning Outcomes		
	Learning Content (Theory and practical)		
	Teaching-Learning Activities		
	Forms of Assessment		
	Follow the NCS guideline given for font size and line spacing		
Assessment Guide page	Forms of assessment		
	Assessment context		
	Assessment conditions		
	Special note		
	Follow the NCS guideline given for font size and line spacing		
Resources required (Approximately 15 students)	Tools,material and equipment require for the training program		
	Item		
	Specifications		
	Quantity		
	Follow the NCS guideline given for font size and line spacing		
Detail page	Page Title(Name of the NCS, level/Levels, competency standard code)		
	Endorsement date		
	Date for review		
	Purpose of the Qualification		
	Regulations for the Qualification Qualification Codes & Packages		
	Prerequisite		
	Accreditation requirement		
	Certification		
	Transition arrangements		
	Requirement of Conducting Knowledge Assessment		
	Contact for comments (Chairman- NAITA and DG-TVEC)		
	Follow the NCS guideline given for font size and line spacing		

- In revised document, original development committee & NITAC should be included at the end of the document.

Marked by

……

Name:

Development/revision/validation inspector Date:

Checked by

……..

Name:

Development/revision/validation facilitator Date:

Annexure 5: Procedure for endorsement of NCS

TERTIARY AND VOCATIONAL EDUCATION COMMISSION

PROCEDURE FOR ENDORSEMENT OF NATIONAL COMPETENCY STANDARDS AND ALLIED DOCUMENTS

Form No.			
111	08	02	01

Scope: To ensure necessary requirements of development process of National Competency Standards being followed and fulfilled.

Overall Responsibility: Implementation of the procedure is the responsibility of D(NVQ)

Flow	Activity	Responsibility	Reference
01	**a.** Request received from industry recommended by NCS Development Monitoring Committee **b.** Recommended occupation / sector submitted to selected organization for development. **c.** TVEC representative participation for validation committee	D(NVQ)	
02	A formal request with following documents should be received by TVEC, from NAITA. **a.** Final draft of the National Competency Standards. **b.** Minutes of the meeting of validation **c.** Attendance of the validation committee **d.** Corrections made at the validation	D(NVQ), NAITA	Master copy of the NCS, Operations manual of NCS, NVQ
03	If validated NCS, proceed to convene SPTAC/Industry for their comments.		
04	Complete the checklist with Followings mandatory requirement. **a.** Compliance with recommended NCS format (in the NVQ operation manual) **b.** Correct qualification code **c.** Packaging or credit values **d.** Development, Validation, NITAC group quorums **e.** SPTAC/ Industry confirmation if available **f.** Confirmation on no similar NCS developed earlier on same occupation sector	D(NVQ) D(NVQ)	NCS Operations Manual Checklist III/08/08/02 NVQ policy for levels 1 to 4, levels 5 & 6

Flow	Activity	Responsibility	Reference
05	Prepare Commission paper If all requirements of checklists are fulfilled	D(NVQ)	Standard Commission memo
Reviewed By: Director NVQ **Date:** 25.03.2021		**Last revision:** none	
Approved By: Director General **Date:** 25.03.2021		**Page 1 of 2**	

Flow	Activity	Responsibility	Reference
06	Obtain DG's concurrence with the signature for submission of the commission memo.	D(NVQ)	111/08/08/02
07	Forward commission memo with copy of details and document of relevant NCS to the commission.(Once formal approval is obtained from the Governing Council of the Commission, through minutes of the Commission meeting, NCS become a National Document for respective Vocational Training.)	D(NVQ)	Minutes of the commission
08	After proof reading of final draft of NCS publishing of NCS.	D(NVQ)	Final draft copy of NCS
09	Update TVEC website with necessary information of NCS and document, viz. qualification codes of NCS.	D(NVQ)	111/08/08/02
10	Endorsement of corresponding curricula and assessment resources should also follow the procedure flow of 01 to 08.	D(NVQ)	
11	**Validation** Comments and necessary updating should be considered at the revision of NCS *Necessary measures of preventive and corrective actions should be taken. 11/08/08/00, 11/08/04/00	D(NVQ	111/08/06/00 Feedback form and other comments
Reviewed By: Director NVQ **Date:** 25.03.2021		**Last revision:** none	
Approved By: Director General **Date:** 25.03.2021		**Page 2 of 2**	

Annexure 6: Checklist for Endorsement

Form No.			
111	08	08	01

Checklist for Endorsement Process of National Competency Standards

(Completed by TVEC)

Title of the NCS:

Code:

Level of the NCS:

If level 1 to 4,

Qualification packages with units: 1.

2.

3.

4.

5.

6.

If level 5 & 6,

Qualification code of level 5:

Qualification code of level 6:

No.	Item/Description	Yes	No	Remarks
01	Whether occupation/sector is approved by NCS Development & Monitoring committee			
02	Whether a formal request/email for endorsement received from NAITA			
03	Is the NCS validated			
04	Are following documents received for endorsement			
	a.Validated final draft copy of NCS			
	b.Comments of validation workshop			
	c.Recommendations from packaging committee			
05	Is comments of validation committee considered			
For level 1 to 4				
06	Is NCS complying with recommended format according to the Operations manual of NCS			
07	Is correct code assigned			
08	Is development group and NITAC composition acceptable			

For level 5 to 6				
09	Is NCS complying with level 5 & 6 recommended format (employability, electives)			
10	Is credit assigned for level 5 match with recommended credit amount			
11	Is credit assigned for level 6 match with recommended credit amount			
12	Is correct code assigned			
13	Is development group and NITAC composition acceptable			

Checked & recommended by DD/ AD: Approval for endorsement by DG:

Date:

Form No.

111	08	08	02

Checklist for Endorsement Process of National Competency Standards

Checked by D/NVQ:

No.	Item/Description	Yes	No	Remarks
Post Endorsement Process				
14	Whether concurrence of governing council obtained			
15	If concurrence given, is it with comments or amendments			
16	Whether minutes of commission meeting received			
17	Is NCS has to be returned to NAITA for amendments			
18	Is NCS proof read by selected outsourced person			
19	Is NCS published			
20	Are qualification codes included in the certificate printing software system			
21	Is TVEC website updated with new NCS details and document			
22	Is respective public comments obtained by TVEC			

Date:

Annexure 7: Boxes of Further Information

Box A1: Issues to be avoided in the development of NCS

The NVQ operation manual-2021 has specified, that NCS NVQ levels 1 - 4 are developed for occupations, there are instances of developing NCS for jobs instead of occupations. That should be strictly adhered to.

NCS for Electricians should have qualification packages for Domestic electricians and assistant electricians too

NCS for Plumbers should have qualification packages for both Domestic plumbers and Industrial plumbers.

Before the NVQ system come into effect, different qualifications entered the labour market which was a confusion for employers. It is claimed internationally that NVQ, a unified vocational qualification system was developed to clear the "jungle of qualifications" and clarity of awarding qualifications. Also Internationally, there is criticism that NVQ had expanded the qualification jungle[15] . Therefore, the Sri Lanka NVQ framework should not contribute to the expansion of the qualification jungle.

Box A2: Analyses of industry sectors to identify sub-industry sectors

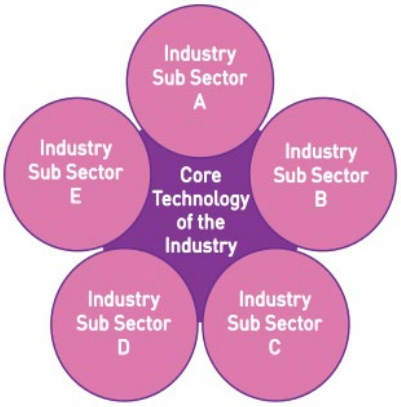


Figure 3.2

Figure 3.3

Source: Figure 3.2 and Figure 3.3 of the NVQ Operation Manual – March 2021

[15] Alison Wolf, 2002, Does Education Matter (A great idea for other people children)

Box A3 : Avoid Development of NVQ Levels 5 & 6 NCS and Curricula for Occupations with [small Labour Market

There are occupations and industry sectors with the annual demand for employment is not significant to sustain a course. For example Alternative Energy Technology and Biomedical Technology are demanding courses in European countries. Europe has a wide labour market to employ qualification holders of those occupations.

If those courses are established in Sri Lanka with an output of 30 diplomas per annum , market will be saturated within a couple of years. Therefore, instead of developing separate NCS for bio-medical technology, it could have been added to NCS for Mechatronics as an specializationor as an elective.

Box A4 – Examples for naming an NCS by the name of the operation

Most of the NVQ Levels 1 -4 NCS are named by occupation name, but an NCS for Cinnamon Factory Works is named Cinnamon Factory Operation (A0S009). Cinnamon factories are still a new concept and occupational names are not yet established. The employer could use a designation to suit the company's HR policy. On the contrary, NCS for tea factory monitory work is named the Tea Factory Officer (A01S017). That may be due to the use of that name in tea factories for centuries. However, if the occupation name is not well established, it could be named with the name of the operation.

There is an NCS for professional cookery. That is another example of using an operation name for the NCS. Here the case may be the well-established operation name.

Box A5 : Importance of NVQ Levels 1 & 2 Qualifications

Importance of NVQ Levels 1 & 2 Qualifications in occupations where semi-skilled and helpers work.

Many jobs such as repair of an automobile, construction works, etc have roles for assistants and helpers. Therefore, NCS for jobs performed by teams could have level 2 and level 1 qualifications.

Non-availability of NVQ Levels 2 & 1 qualifications in the past was a problem for non-formal qualifications in schools. Due to lack of facilities in non-formal courses, they could not get NVQ Level 3 course accreditation. Those courses could not get Level 2 accreditation due to the non-availability of NVQ Level 2 qualification in the most popular occupations. This is an accessibility issue. If trainees without GCE(O/L) could get an NVQ Level 2 from non-formal education, he /she could get admission to an NVQ Level 3 course easily and continue learning. This issue is addressed in the VET Plan for EE sector and TVET Policies 2020 – 2030 prepared by the NEC.

Annexure 8: Members of the Validation Committee

Name		Institute
1.	Mr. B.H.S. Suraweera	Former DDG,TVEC
2.	Mr. P.N. K. Dias	Former Director(Quality), NAITA
3.	Dr. D.D.D. Suraweera	Senior Lecturer, UNIVOTEC
4.	Mr. Channa Subasinghe	Director (Quality), NAITA
5.	Ms. M.P. Theja Malkanthi	Assistant Director, NAITA
6.	Mr. Indika Pushpakumara	Program Officer, Univotec
7.	Mrs. Chandrani Premarathna	Former Director(NVQ), TVEC
8.	Mr. Suraj Jayathilake	Director(HRDC), UNIVOTEC
9.	Dr. J.A.D.J. Jayalath	Deputy Director General, TVEC
10.	Dr. Ajith Polwattee	Director(NVQ), TVEC
11.	Mr. S.U.K. Rubasinghe	Director(R,A&QMS), TVEC
12.	Ms. Priyanga Nanayakkara	Actg. Director(AQA), TVEC
13.	Mr. Manoj Ganepola	Director(IS), TVEC
14.	Dr. Dilrukshi Herath	Deputy Director (cov-up)-NVQ,TVEC
15.	Ms. B.S.J Vipulsi	Assistant Director (NVQ), TVEC
16.	Ms. Upeksha Wijebandara	Assistant Director (NVQ), TVEC

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