

A SHIFT FROM ASSESSING A SET OF LEARNING CONTENTS TO ASSESSING EACH LEARNING OUTCOME: NACTE'S PERSPECTIVE

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Abstract

Assessment is the general term used for measuring student's performance on a course against the set learning outcomes of the particular educational programme. When the mode of assessment is not sound, educational programmes suffer and definitely, students are victimised. Assessment plays an important role in influencing a student's academic prospects, career opportunities and even job success. The same also helps to provide accurate predictions for future academic success or future professional competence.

Under the contemporary world, employers are becoming increasingly concerned with ensuring that their employees have up-to-date competencies and capabilities needed in the world of work. Given the increasing importance attached to assessing a wider range of competencies (i.e. knowledge, skills, understanding and wider attributes), it is clear that relying on traditional methods of assessment, is not regarded as appropriate means of responding to an ever-increasing demand to provide relevant, quality, and effective education.

This paper discusses NACTE's Perspective on the shift from assessing a set of learning contents (topics) to assessing every learning outcome in respective curriculum to students in technical institutions in Tanzania, in order to generate high quality graduates who are able to respond to labour market needs.

Introduction

The primary purpose of most of the educational curricula is to inculcate knowledge, skills, understanding and wider attributes to students. The success of any curriculum in fulfilling this objective can be assessed in many ways, one of which is through the administration of examinations. The major purpose of examinations therefore is to investigate the extent to which students have gained from instructions.

Assessment influences a student's academic prospects, career opportunities, and even success on the job in the world of work. It further helps to provide accurate predictions for future professional competence. The quality of assessment is of paramount importance in order to provide competent graduates. A competent graduate is the one who can be able to demonstrate ability to successfully carry out some occupational activity more efficiently in terms of responsibility and degree of independence.

In recent years, employers are becoming increasingly concerned with the employees' capabilities and competencies demanded by the labour market. Given the increasing importance attached to assessing a wider range of competencies, it is clear that relying on assessing a set of examinations is not regarded as appropriate means of responding to an increasing demand to provide relevant and quality education and training. In order for students to acquire the required competencies, NACTE advocates reforming curricula in training institutions from conventional to competence/outcomes-based to necessitate a shift from assessing a set of examinations to an assessment that shall focus on assessing learning outcomes.

The establishment of the competence/outcomes-based education and training requires change of assessment approach and methodology from the acquisition of knowledge to the acquisition of skills, knowledge, understanding and wider attributes. The implementation of the approach and use of a range of assessment methods and techniques require that learners be assessed against outcomes by using appropriate assessment methods. Such a paradigm shift involves, amongst other things, the development of competence-based curricula. The curricula should comprise *statements* on what someone with a particular qualification should be able to do in the world of work and typical *context* that a person who successfully followed the developed curricula could work in more efficiently.

Competence/Outcomes-Based Education and Training

A Competence-Based Education and Training (CBET) System is a system of education and training that is designed to ensure that upon graduation from the system, learners possess the **requisite competencies** that can be **applied flexibly** in relevant **workplaces**.

Generally, CBET is intended to realize the purpose and values of learning in a better way than a conventional or sometime referred to as the Knowledge Based Education and Training (KBET) system could achieve. This is because CBET targets to serve both the learners in institutions of learning and the market (employer, profession, society, Government) by ensuring that the former is provided with competences or outcomes that meet the needs and interests of the latter. At the middle is the provider of education and training who has to realize the aspirations of the learners while taking into consideration the employers' expectations. Central to all these aspirations under CBET is the role of quality assurance organs (regulators) which set **competence standards** that will ensure the interests of all relevant parties are met. A competence standard usually includes what a person should be able to do, the way in which one can judge if what was done was done well, the conditions in which a person must demonstrate his/her competence, and the types of evidence necessary and sufficient to assure that what was done, was carried out in a consistent manner and based on effective knowledge, skills and understanding, depending on particular job requirements.

What is a Competence?

CBET is implemented in various countries in the world. Although the term "Competence" may be defined and in fact is defined differently in different countries, the ultimate goals of CBET are more or less the same.

According to NACTE, a competence is associated with clear *ability to successfully carry out some occupational activity* and it is described in terms of: (i) *Skills', knowledge', and understanding'*; (ii) *Typical context and level* that a person who possesses the competence could work in; and (iii) *Wider attributes (conducts or attitudes)*.

While **skill** is defined by the ability to do specific things without necessarily understanding the processes by which one does them (practical component of competence), **knowledge** is regarded as information that has been gathered and recorded in one's memory and that which can be recalled in responding to a question (theoretical component of competence). In some way, **understanding** combines skill and knowledge as it involves grasping of concepts and being able to use them creatively through a clear realization of what one is doing and why (foundation component of competence). The three components of competence described above are normally referred to as applied competencies. These are usually evaluated by the application of written or oral tests (for knowledge and understanding) and/or exercises of practical tasks applicable to a job function (for skill).

On the other hand, **wider attributes** represent behavioural component of competence and cover many of the desired workplace attitudes/conducts and life skills necessary for success in one's occupation/life within the modern global economies. In contrast to applied competencies, wider attributes are detected through the realization of simulated exercises of critical situations. The learner is placed before a fictitious event, previously designed and their reactions are examined, determining if they exhibit the desired attitudes.

In short, the concept "competence" relates to the ability *to carry out a specific task*, and it is this interpretation of competence that forms the foundation of the National Technical Awards (NTA) established by NACTE. The concept is therefore output, or outcomes-based.

National Technical Awards (NTA) Framework

One of the statutory functions of the National Council for Technical Education (NACTE) is to establish and make awards in technical education and training in Tanzania. The Council has defined and established a range of National Technical Awards (NTA) to be conferred on successful graduates for the various fields of technical education and training. The NTA are competence/outcomes-based defined according to specific level of achievement and designed to testify that the holder of the award possesses the requisite knowledge necessary to apply competently the knowledge and skills described in the relevant occupational sector.

At present, there are seven NTA levels under NACTE. Each NTA level represents a planned combination of learning outcomes, which has a defined purpose and which is intended to provide qualifying learners with applied competencies and a basis for further learning. An NTA level is described by some attributes that are specific to the level. These are referred to as competence level descriptors. NACTE has adopted appropriate level descriptors and embedded in the enabling outcomes. The level descriptors begin with a description of learning competencies a learner should have at each exit level and the autonomy of learning as a category to reflect the ability to pass judgement on work and to increasingly become more independent as presented in Table 1 below:

Table 1: Competence Level Descriptors

| NTA Level | Learning Competence | Autonomy of Learning |
|---|---|---|
| 4 (Basic Technician) Certificate | Competence involving application of skills and knowledge at routine level. | Ability to: <ul style="list-style-type: none"> • Work alone or with others in directed activity; • Work alone or with others on tasks with close supervision. |
| 5 (Technician Certificate) | Competence involving application of skills and knowledge in a range of activities, some of which are non-routine. | A capacity to: <ul style="list-style-type: none"> • Work alone or with others in directed activity; • Work under general supervision and quality control; • Work with some responsibility for guiding others. |
| 6 (Ordinary Diploma) | Competence involving application of skills and knowledge in a broad range of activities, most of which are non-routine. | Ability to: <ul style="list-style-type: none"> • Work alone or in a team in directed activity with some autonomy; • Work under general supervision and quality checking; • Work with significant responsibility for the quantity and quality of output; • Manage limited resources within defined areas of work; • Work with possible responsibility for the output of others. |

| | | |
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| <p style="text-align: center;">7 (Higher Diploma)</p> | <p>Competence involving the application of skills and knowledge in a broad range of complex activities, a high degree of personal responsibility and some responsibility for the work of others.</p> | <p>Ability to:</p> <ul style="list-style-type: none"> • Work alone or with others in self-directed activity; • Work under broad guidance and evaluation; • Work with complete responsibility for quantity and quality of output; • Work with possible responsibility for the quantity and quality of the output of others in defined areas; • Exercise some initiative and independence in carrying out defined activities at a professional level. |
| <p style="text-align: center;">8 (Bachelor Degree)</p> | <p>Competence involving the application of knowledge, skills in a wide and unpredictable variety of context with substantial personal responsibility, responsibility for the work of others and responsibility for allocation of resources, policy planning, execution and evaluation.</p> | <p>Ability to:</p> <ul style="list-style-type: none"> • Work alone or with others in self-directed and sometimes directive activity; • Work under broad guidelines or functions; • Work with full responsibility for the nature, quantity and quality of outcomes; • Work with possible responsibility for the achievement of group outcomes; • Work with possible responsibility for allocation of resources, policy, planning, execution and evaluation; • Exercise autonomy and initiative in some activities at a professional level; • Delegate functions to technicians and peers. |

| | | |
|--|--|---|
| <p style="text-align: center;">9 (Master's Degree)</p> | <p>Competence involving mastery of a complex and specialized area of knowledge and skills to conduct advanced technical or professional activity.</p> | <p>Ability to:</p> <ul style="list-style-type: none"> • Exercise initiative, creativity and personal responsibility; • Exercise substantial autonomy and initiative in professional and equivalent activities; • Take significant managerial or supervisory responsibility for the work of others in defined areas of work; • Take continuing account of own and others' roles, responsibilities and contributions in carrying out and evaluating tasks; • Work in support of current professional issues in accordance with current professional and/or ethical codes or practices; • Demonstrate originality or creativity in the application of knowledge, understanding and practice. |
| <p style="text-align: center;">10 (Doctorate Degree)</p> | <p>Competence involving mastery of a complex and specialized area of knowledge and skills to conduct advanced technical or professional activity and advanced research undertakings.</p> | <p>Ability to:</p> <ul style="list-style-type: none"> • Exercise autonomy and initiative in professional activities; • Demonstrate leadership and originality in tackling and solving technical problems; • Deal with complex ethical and professional issues and make informed judgements on issues not addressed by current professional practices. |

As shown above, each level descriptor is divided into competence descriptors and job roles. The key roles require specific standard of achievement presented in the learning outcomes. The achievement of standards is assessed during both formative and summative evaluations. The implementation of such system of assessment therefore requires the enabling environment – one in which the integrated assessment is made possible.

Overall Description of Curriculum in a *CBET* System

Normally, the enabling tasks and environment for one to realize the competencies specified for a particular NTA are provided by the curriculum. The *CBET* Curriculum is widely defined as teaching and learning experiences taking place in a learning institution and includes the *purpose of learning, what is being taught, methods and strategies used to teach and learn, as well as form of assessment and certification.*

Purpose of Learning

The main purpose of learning is usually linked with achieving a certain qualification. In *competence-based education and training*, qualifications are described by sets of competencies that should serve as reference for the performance of specific job positions, irrespective of the time taken to attain such competences.

As it has already been described above, a competence is associated with clear *ability to successfully carry-out some occupational activity* and it is described in terms of ‘*skills*’, ‘*knowledge*’, and ‘*aptitude or understanding*’ as well as typical ‘*context*’ and ‘*level*’ that person who possesses such competence could work in. Purposes of learning in a competence-based curriculum should therefore be clearly stated to indicate the targeted abilities in terms of skills, knowledge and understanding in line with the set standard at that level and work context. Knowing the purpose of learning, the Principal Outcomes are subsequently formulated. Principal outcomes are outcomes at a high level of abstraction specified by a regulatory body for this case, NACTE, and are used to indicate what the learner should be able to demonstrate following completion of a particular training programme. Normally, the purpose of learning indicates the typical ***context*** that persons with the qualification could work in more efficiently, the principal learning outcomes indicate the ***task*** i.e. “what the learner should be able to demonstrate” following the completion of a particular training programme at a designated level. From the principal outcomes, enabling outcomes are formulated. The enabling outcomes are more focused statements that describe the knowledge, skills, understanding and wider attributes that learners will have to acquire after following an academic programme of a particular training or study. Realization of enabling outcomes can be through a set of teaching/learning methods and strategies such as; practical work,

field-work, assignments, tutorial sessions, demonstrations, simulations, or combination thereof.

Curriculum Contents

After identifying and selecting appropriate level of tasks/functions that can be reframed as Principal Learning Outcomes for the qualification under consideration, statements on all principal outcomes necessary to realize purpose of the qualification are formulated. The contents of a *competence-based curriculum* include statements describing abilities that are required to successfully carry out occupational activities of specific context and level.

The following could serve as a typical example of formulation of statements on principal outcomes for Entrepreneurship and Development Curriculum at NTA Level 4:

Entrepreneurship and Development at NTA Level 4

NACTE Standards and Related Enabling Outcomes

| Principal Outcomes | Enabling Outcomes |
|---|--|
| 1. Be able to implement simple technical projects under close supervision | 1.1 Ability to establish own business venture |
| | 1.2 Ability to run own business |
| | 1.3 Ability to integrate gender into development plans |
| | 1.4 Ability to prevent risk factors for HIV infection |
| Enabling Outcomes | Sub-Enabling Outcomes |
| 1.1 Ability to establish own business venture | 1.1.1 Ability to prepare procedures for project profile 1.1.2 Ability to establish logical framework on planning, monitoring and evaluation tools 1.1.3 Ability to define project life cycle |

| | |
|--|---|
| 1.2 Ability to run own business | 1.2.1 Ability to identify feasible and viable project proposals 1.2.2 Ability to prepare cash flows and analysis |
| 1.3 Ability to integrate gender into development plans | 1.3.1 Ability to use gender terminologies correctly 1.3.2 Ability to identify socio-cultural factors affecting gender equality 1.3.3 Ability to understand linkages between gender and development |
| 1.4 Ability to prevent risk factors for HIV infection | 1.4.1 Ability to understand concepts of HIV/AIDS 1.4.2 Ability to identify socio-cultural practices contributing to the spread and prevalence of HIV/AIDS 1.4.3 Ability to understand effects of AIDS in relation to economic development |

A competence-based curriculum is divided into smaller modules with clear meaning and value on the job. A module is self-contained as much as possible, and is individually assessed and consists of a unit of knowledge, skills and understanding which is recognized as separate from other such units. A module is a building block from which learning programmes are constructed. It allows shorter courses be offered to learners according to individual and occupational needs, rather than the longer, more inflexible and expensive full programmes normally covered in conventional curricula.

Teaching and Learning Strategies

Teaching and learning in competence-based curricula are geared towards enabling the learner achieve abilities that are required in their personal or professional lives within respective contexts. Hence, depending on the level, insistence is placed upon imparting applied competencies and promotion of the life skills which include generation of attitudes focused on initiative, problem solving, interpretation, anticipation, cooperation and creation of a positive working environment. These attitudes are generated more in

the pedagogical strategies used than in the curriculum contents themselves (e.g. creation of pleasant educational environment, motivation of staff, promotion of learning by problem solving, promotion of use of diverse didactic media, etc.).

Overview of NACTE's Assessment Procedures and Certification

Assessment is a continuous and ongoing process. That means that a learner's progress shall be monitored continuously. Basing under this principle of assessing learners, at present, NACTE has adopted an integrated model of assessment system, which includes a balance of:

- (a) Continuous Assessment (CA); and
- (b) Semester Examinations.

It is important to take note that continuous assessment is important to consider when judging student's competence because it focuses on facilitating learning process and is used to adjust teaching, learning and future assessment. So, NACTE's assessment considers both formative and summative evaluations. The formative assessment has to take place at pre-arranged places during the learning process where learners have to demonstrate competence on achievement of outcomes. Results are recorded and have to contribute to the final award.

The summative assessment on the other hand, shall document student general performance after instruction is completed. This assessment often occurs at the end of a learning programme/module. Results are expressed in terms of competence achieved with regard to a learning programme outcome. Results from formative and summative assessments are used to record, report and award credits. In this spirit, continuous assessment includes a variety of assessment methods to include projects, tests, case studies, simulations, group work, etc. aimed at developing the learners as well as testing and judging how well they can perform specific assigned tasks related to the particular qualification in a particular field.

Curriculum Assessment

NACTE emphasizes that curricula of learning institutions should be transformed to competence-based in order to allow assessment procedures to be based on smaller units of work that can be credited towards a qualification at any given level. Under competence/outcomes-based curricula, an examination shall not focus on assessing a set of learning contents as it is the case with conventional assessments. The entire competence/outcomes-based system is driven by assessments that focus on well-defined learning outcomes.

Assessment of competence-based curriculum is the basis for the certification of competence, and is carried out as a process to gather pieces of *evidence concerning the performance and knowledge of an individual in relation to a competence standard*. This grants it a very appreciable role as instrument of diagnosis for the worker and the employer. As it is well known, conventional systems of assessment tend to present all or some of the following characteristics:

- (a) Assessment is associated with a course or programme;
- (b) Parts of a programme are included in the final examination;
- (c) Approbation based on scales of points;
- (d) The questions are unknown;
- (e) Assessment is carried out in a defined amount of time;
- (f) Assessment uses statistical comparisons.

On the other hand, assessment in competence-based education and training has the following characteristics:

- (i) It is centred on results of labour performance;
- (ii) Not determined by time;
- (iii) It is individualized;
- (iv) Not associated with a course or study programme;
- (v) Does not compare different individuals;
- (vi) Its result is either competent or not yet competent.

Competence-based assessment is the process of collecting evidence and making a judgement on whether competence has been achieved. Competence is something that can be observed. Under competence/outcomes-based education, there exists many recommended approaches of assessing students' academic achievements but the most useful approach is known as "Holistic Assessment Approach". Holistic assessment refers to assessment, which checks a wider range of skills, knowledge, understanding and competencies combined together to successfully complete practical workplace tasks.

It should be noted that in order to train towards the achievement of set standards, it is crucial that teachers give trainees the knowledge, skills and competencies about the whole working process that means "how" and "under which" circumstances you make decisions, plan the work, organize the implementation and evaluate the work done. This integrated approach to assessment aims at integrating learner's cognitive, psychomotor, and affective domains into assessment tasks. The approach can be used during formative or summative assessments.

Assignment of Credits

Qualification designers need to ask themselves: "What amount of time would a typical average learner require to complete a specified learning outcome, including time spent practically, in study and face-to-face?" When this is done for all the specified outcomes, it provides a figure of notional hours for each specified learning outcome that can be given a credit value.

A credit is an instrument for measuring and expressing learning equivalence and plays an important role in rewarding the incremental progress of learners, facilitating student transfer, recognizing prior learning and contributing to the definition of academic standards.

NACTE awards credits only for students who show evidence of learning achievement. The credit is derived through estimation of notional learning time at a particular NTA level.

A notional time is a period spent by an average student in learning about something towards realizing a learning outcome. This could include formal learning in classroom,

out of class formal learning, e.g. in doing projects, and learning gained through on the job experience. Under NACTE's perspective, a ratio of *1 credit = 10 hours* is employed. In order to earn a credit at a particular qualification level, the student must satisfy the above discussed assessment criteria for all (or the majority) of the designated learning outcomes of the module.

The number of credits awarded for successful realisation of completion of one principal learning outcome is called a credit value of that particular principal outcome. In order to earn credits at a particular NTA level, the learner must satisfy the assessment criteria for all (or the majority of) the prescribed principal learning outcomes that describe the qualification at that particular level.

The national credit system is a framework with a set of specifications that is used by all technical institutions. It has been designed to be inclusive of all forms of learning and all types of awards. The system specifies the minimum compulsory credits for each NTA level. It also specifies how credit accumulation may be done in relation to other (lower) NTA levels.

The minimum overall credit values assigned to qualifications under NTA are highly linked to the competence descriptors at respective levels. Minimum credits assigned to the various NTA Levels are also independent of the fields of specialisation or occupations. NACTE has assigned credits to each NTA as schematically shown in Table 5 below.

Table 5: Credit Guidelines for the Various NTA Levels

| NTA Level | Qualification Title | Minimum Overall Credits | Minimum Credits from Current NTA Level | Maximum Credits from Lowest NTA Level | Lowest NTA Level |
|-----------|------------------------------|--------------------------------------|--|---------------------------------------|------------------|
| 4 | Basic Technician Certificate | 120 <i>(From NTA 4)</i> | 120 | 0 | - |
| 5 | Technician Certificate | 120 <i>(From NTA 5)</i> | 120 | 0 | 4 |
| 6 | Ordinary Diploma | 240 <i>(From NTA 6 & 5)</i> | 120 | 30 | 5 |
| 7 | Higher Diploma* | 360 <i>(From NTA 7,6,5)</i> | 120 | 30 | 5 |
| 8 | Bachelors Degree | 480 <i>(From NTA 8,7,6 and 5)</i> | 120 | 30 | 5 |
| 9 | Masters Degree | 180 <i>(From NTA 9 & 8)</i> | 150 | 30 | 8 |
| 10 | Doctorate Degree | 540 <i>(From NTA 10,9,8)</i> | 360 | 30 | 8 |

* This qualification is part of the degree programme and will be offered by technical institutions mandated to offer degree programmes.

A credit plays an important role in rewarding the incremental progress of learners, facilitating student transfer, recognizing prior learning and contributing to the definition of academic standards.

In order to **assure quality** as well as facilitating uniform interpretation of qualifications amongst stakeholders and hence transfer of credits under CBET, competencies (mainly the applied competencies and to lesser extent the wider attributes) are **standardized** within the overall description of curriculum.

Conclusion

The rapid technological changes in the labour market and the effects of globalization of the economy demand competence-based approach of learning for employers to realize the capability of graduates from technical institutions on their job including learning new skills. By establishing the NTA system, NACTE has put in place a unified and effective technical education and training system that is relevant to both individual and national socio-economic developments. The NTA provide clear and accurate information about the purpose of learning and learning outcomes for the purpose of assessing students from technical institutions in Tanzania, in order to generate graduates of high quality who are able to respond to labour market needs.

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