

## The Role of Industry in CBET Curriculum Development Process. A Case of Nyandarua National Polytechnic, Kenya

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### Abstract

*TVET institutions in Kenya have been mandated to equip trainees with skills and competencies in trade areas that match the industry's needs. The TVET Sector in Kenya has undergone several reforms since 2013, with the most recent being four years ago, when a need to review the skills provided to trainees in TVET institutions emerged. This followed concerns raised by various stakeholders about the mismatch of skills in the industry. This aims to achieve the Sustainable Development Goals. A study by the Kenya Association of Manufacturers (2017) established that the training content in the TVET institutions did not match industry needs. It's therefore in this regard that this study investigated the role of industry in the CBET Curriculum Development Process, a case of Nyandarua National Polytechnic. A descriptive research design was applied. A stratified random sampling technique was employed to obtain a sample of respondents, where 53 industry experts were identified to participate in the study. A questionnaire consisting of both structured and open-ended questions was developed for the study, and results were coded, tabulated, and analyzed the SPSS. Findings from the study revealed that industry and sector skills play a critical role in ensuring there is no mismatch between the skills provided in the learning institution and those required in the industry. It was therefore recommended that TVET institutions, in collaboration with relevant industry/sector skills together be involved in curriculum development to ensure effective implementation of CBET. In conclusion, the industry is key in retooling the TVET curriculum for the industrial revolution.*

**Keywords:** Industry, CBET, Curriculum Development, Sector Skills Advisory Committee (SSACs), Sustainable Development

## Introduction

### Background Information

Competency-Based Education and Training (CBET) is a mode of training where the emphasis is placed on the acquisition of competence. It is designed to meet the demands of industry and business. It involves training individuals to be able to perform to the standards required in employment, in an agreed range of contexts, repeatedly over time. They are required to be able to meet the required standards in employment to match the industry's needs.

The Government of Kenya has embraced TVET, and this has seen many reforms in the recent past as the Country strives to produce skilled labor for the realization of the Big 4 Agenda and achieving Vision 2030. A study by the Kenya Association of Manufacturers (2017) established that the training content in the TVET institutions did not match industry needs. This mismatch has led to TVET institutions producing “half-baked” graduates whose skills do not match those of the industry. Successful implementation of CBET requires enactment of national policies, strategies, standards, and guidelines to support and facilitate the process.

### Global Perspective of CBET

The globalization process, industrial advancements, technological changes, and competitive global labor market bring the need to adopt the CBET programmes. According to Makunja (2016), competence-based curriculum is not a new concept in education systems of the world since the demand for greater accountability in education towards community involvement in decision making gave great impetus to the concept. The CBET approach can be traced back to the education of primary and vocational teachers in the United States of America (USA) in the late 1960s. By 1977, some 23 states had implemented performance-based vocational teacher education, and in the late 1980s, the concept shaped many programs of vocational education and training. Based on the need to produce skill-based individuals, many countries globally, such as the United Kingdom (UK), Germany, the Netherlands, Australia, and Canada historically introduced the CBET in their countries.

It is, however, noted that most of these countries have implemented the CBET in their way, based on the unique skills required to fit their systems. Germany introduced CBET at vocational level training in the 1970s (Mulder M. et al, 2007) with a view of addressing the issue of high rates of unemployment, especially among the youth, while the UK adopted it a decade later (Harris R. et al, 1995). In 1990, the Australian Federal and State Ministers responsible for Vocational Education and Training (VET) established a framework for the implementation of Competency-Based Training (CBT) in Australia. CBET is greatly rooted in different countries globally, and this shows the advancements that have been made to ensure that youths globally are equipped with adequate skills that will enable them to fit into the competitive world for employment.

### Regional Perspective of CBET

Most African countries have adopted the CBET approach following the success of CBET in most European countries. The competency-based approach focuses on revitalizing the skills of the graduates to bridge the mismatch currently experienced in the workforce in most African countries. However, the implementation of this approach has experienced various challenges in its implementation in most African countries since

the competence-based approach has been implemented under severe challenges without adequate and appropriate preparations, as there is are lack of adequately prepared trainers and resources, frequent curricula changes, lack of employers' cooperation, discontent of trainers and administrators, etc.

According to Rutayuga (2012), Okoye and Isaac (2015), Dadi (2014), Kufaine and Chitera (2013), the following African countries, including South Africa, Malawi, Ghana, Ethiopia, and Tanzania, started to adopt the CBET Approach. In Tanzania, the CBET approach was introduced in the year 2000, and its implementation started in technical colleges in the year 2002. However, the implementation is marred with various challenges, including low understanding of the CBET concept, lack of support facilities and resources, large number of trainees in classrooms, lack of motivation to some trainers due to unfavorable working conditions, and low trainees' cooperation attitude (Mariam A. T, 2007).

### **Kenyan Perspective on CBET**

The ever-increasing unemployment among the youths, mismatch of skills with industry needs, and lack of policies are some of the factors that steered the introduction of CBET in Kenya to fill this gap. The enactment of TVET Act No. 29 of 2013 established the Technical and Vocational Education and Training Authority (TVETA) under section 7 to coordinate and regulate the TVET sector; TVET Curriculum Development, Assessment and Certification Council (CDACC) under section 44 to undertake the design and development of TVET curricula, assessment, and competence certification; and TVET Funding Board under section 47 to provide funds for financing TVET institutions. Section 26 (2) of the TVET Act of 2013 establishes National Polytechnics with respective legal orders allowing them to develop their own training programmes and award qualifications. Several TVET institutions in line ministries have legal mandates to develop curricula, train, and award qualifications. Similarly, universities established under section 25 of the Universities Act 2012 develop their own programmes, train and award qualifications.

### **Nyandarua National Polytechnic**

The Nyandarua National Polytechnic (NyNP) was elevated to become a national polytechnic in Kenya in 2020 and has been recognized as a Qualification Awarding Institution (QAI) under the State Department of TVET, as stated in the legal notice. The Competency-Based Educational Training (CBET) was first introduced in NyNP in the year 2021, with students registered in different TVET CDACC programmes.

### **Statement of the Problem**

Skills acquisition is the core mandate of every TVET institution aiming to produce graduates with quality skills for a productive and competitive world. Following its mandate, NyNP has partnered with relevant industries, bringing together various Sector Skills Advisory Committees (SSACs) to develop 28 CBET curricula. In collaboration with different industry stakeholders and various surrounding TVET institutions, the polytechnic sought to address the current skill gaps witnessed in the industry by engaging various industry stakeholders in the curriculum development process to develop curricula that reflect the needs of industry. It's therefore in this regard that this study sought to understand the role of industry in the CBET Curriculum Development Process in Nyandarua National Polytechnic.

### **Aim of Study**

The study aimed to determine the role of industry in the CBET curriculum development process in Nyandarua National Polytechnic.

## Objective of the Study

### Specific Objectives

- To determine how the industry-led curriculum development process addresses the skills gap in the industry.
- To identify how CBET addresses the industry demands in promoting skills acquisition among trainees in Nyandarua National Polytechnic
- To identify challenges in the industry-led CBET curriculum development process in Nyandarua National Polytechnic.

## Justification of Study

A study by the Kenya Association of Manufacturers (2017) established a mismatch in the skills acquired by trainees in the TVET institutions and those required by the industry. The government, in efforts to reform the TVET sector in the Country, has made some noticeable steps in ensuring effective implementation of CBET. Most TVET institutions, including Nyandarua National Polytechnic, have been experiencing several challenges, such as a lack of clear guidelines and framework regarding CBET assessment and implementation, inadequate infrastructure, resources, and materials for training CBET, among others, and instability within the education sector, seeing TVET institutions producing “half-baked” graduates whose skills do not match those of the industry.

## Significance of Study

The study highlighted the role of industry in the CBET curriculum development process in Nyandarua National Polytechnic and recommended strategies to be adopted to bridge the gap seen the industry and TVET institutions. It also aimed at informing different stakeholders on some of the recommendations to be adopted in ensuring the effective implementation of CBET.

## Scope of the Study

This study was conducted in Nyandarua National Polytechnic, an accredited TVET institution in Kenya. The research focused on determining the role of industry in the CBET curriculum development process in Nyandarua National Polytechnic in Kenya. Respondents, 53 industrial experts, were identified to participate in the study.

## Limitations of the Study

This study was limited by the fact that it was not possible to be able to control some of the extraneous variables that were encountered while conducting the study, for example, bad weather conditions. Due to financial limitations, among other factors. Therefore, it was not possible to attain the highest level of accuracy. On the other hand, internet access to the respondents might have affected the response rate.

## Definition of Operational Terms

CBET: Competency-Based Educational Training.

CBA: Curriculum-Based Assessment

NyNP: Nyandarua National Polytechnic

KAM: Kenya Association of Manufacturers

TVET: Technical Vocational Educational Training

CDACC: Curriculum Development Assessment and Certification Council

TVETA: Technical Vocational Educational Training Authority

SSACs: Sector Skills Advisory Committee

QAI: Qualification Awarding Institution

## Literature Review

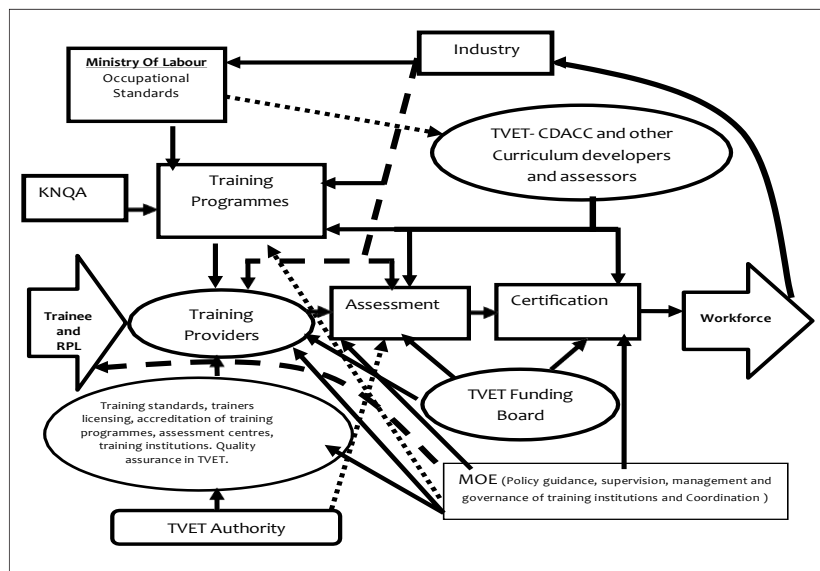


Figure 1: The proposed competency-based education and training approach

### Trainers' Factors Affecting the Implementation of the CBET Curriculum

Trainers' factors include, but are not limited to, aspects such as general awareness and understanding, knowledge and skills, perceptions and attitudes, and training about the CBET curriculum. Komba and Mwandangi (2015) asserted that implementation of a reviewed curriculum essentially depends on the trainers' awareness, knowledge, skills, and the general understanding that they have of the curriculum change. The same has also been claimed by Altinyelken (2009) that trainers play a significant role in any reform processes, and therefore, the above-mentioned aspects should be taken into consideration in the implementation of the reviewed curriculum for the effectiveness of the processes of change.

### Trainers' Awareness and Understanding of the CBET Concept

It's now about 40 years since the introduction of Competency-Based Education. The approach to education started in the United States of America (USA) in the late 1960s. Historically, countries such as the United Kingdom (UK), Germany, the Netherlands, and Australia have implemented a competence-based education approach.

The trainers' general awareness and understanding include how the trainers are aware that they are implementing a CBET curriculum, and they need to know what is emphasized in it. This includes awareness and understanding of CBET objectives and suggested teaching methods, as well as assessment methods. For any new or changed curriculum, the awareness and understanding depend on the training provided to trainers in order to enlighten them about the changes made. This has been supported by Komba and Mwandangi (2015) when they write that regular training for the trainers is very important since it enables

them to acquire up-to-date teaching knowledge and skills to effectively implement the curriculum, which in this context is the CBET curriculum.

### **Trainers' Knowledge and Skills About the CBET Curriculum**

It is argued that trainers need to understand the context of the current CBET system in terms of the role, key characteristics, advantages and limitations, components, and potential alternatives (Deißinger and Hellwig, 2011); also, to know how well trainers can design a CBET curriculum.

### **Availability of Resources for Implementing the CBET Curriculum**

The availability of resources for implementing the CBET curriculum includes two major types, namely human resources, which imply the availability of trainers as well as teaching and learning facilities that include laboratories, workshops, a library, and classrooms with necessary equipment. It is claimed that “CBET requires a lot of teaching and learning materials since it emphasizes practical and immediate assessment” (Kufaine and Chitera, 2013). Furthermore, CBET requires up-to-date teaching and learning aids as technology keeps changing. That is why it is stated that, for CBET to be successful, materials need to change fast as per the change of technology so that graduates from technical colleges can have skills relevant to the industry” (Kufaine and Chitera, 2013).

Research reveals that CBET is a resource-intensive system, meaning that CBET is demanding as it needs a lot of resources in terms of human and material (Rutayuga, 2012). This implies that effective implementation of the CBET curriculum demands a lot of resources, including adequate trainers whose numbers are in the right proportion to the number of students. Also, enough space in workshops and classrooms, adequate facilities such as laboratory equipment, books, computers, library, and internet facilities that are balanced with the number of students for effective teaching and learning.

It is also emphasized that resources are crucial for the effective implementation of curriculum change and that poor conditions and limited resources can limit the performance of even the best trainers and students (Altinyelken, 2009). Generally, from the above discussed factors that need to be taken into consideration during the implementation of the curriculum change, it seems that the change of any education process is a complex issue because it may require “teachers and students to change their practices, beliefs, use new materials, and corresponding learning outcomes in the direction of some sought-after change” (Fullan, 2005).

Therefore, managers must pay attention to any factor that will influence the change in a negative way to avoid ineffective implementation of the corresponding curriculum. In that light, literature supports the idea that there is a need to assess how the CBET curriculum is implemented to gain an understanding of its effectiveness. Thus, effective curriculum implementation can only occur in the context of all components and aspects viewed and implemented in integrated ways.

### **Trainers' Perceptions About CBET Curriculum**

Deißinger and Hellwig (2011) argue that before the actual implementation of the CBET curriculum, trainers' attitudes and perceptions should be assessed. Trainers need to be enthusiastic about CBET, about applying the principles in practice and overcoming the barriers and solving the problems that are bound to emerge with CBET. For successful implementation, trainers should be comfortable with the philosophy of CBET and strongly believe in the potential of the CBET system, should be open-minded about pushing ahead into



the relative unknown that lies ahead for CBET (Deißinger and Hellwig, 2011). Furthermore, Dadi (2014) argues that “teachers' perceptions are important elements in the teaching and learning process of the students. In addition to that, Geçit (2016) points out that trainers and teachers' positive perception towards any educational change is vital for its successful implementation.

## Methodology

### Introduction

This chapter presents the research designs, location of the study, target population, sample and sampling procedures, instrumentation, data collection procedures, pilot testing, and data analysis.

### Research Design

A descriptive survey design was used for the study. According to Orodho (2003), descriptive design is a procedure of collecting information by interviewing or administering questionnaires to a sample of respondents. It was the best for the study since it described and explained the events and variables as they are, while conducting the research. According to Kasomo (2006), a survey is used to gather data from a large number of samples at a particular time to describe the nature of the problem being investigated.

### Target Population

A population refers to an entire group of individuals, events, or objects having a common observable characteristic (Mugenda and Mugenda, 1999). The target population for the study was trainers and industrial experts who were engaged in the CBET curriculum development process in Nyandarua National Polytechnic.

### Sample Size and Sampling Procedures

According to Gray (1992), a minimum sample size of 20% of the target population can be adequate in research in social sciences. Simple random sampling and stratified sampling were used to identify 53 industrial experts withdrawn from different sectors in the industry.

### Instruments

A closed, closed-ended structured questionnaire was used to collect data for the study. A questionnaire is a research tool that gathers data from a large sample (Kombo 2006). The questionnaire was structured in five sections (A, B, C, and D). Section A of the questionnaire was based on the demographic information of the respondents. Section B sought information on the various factors that influenced the implementation of CBET programs, the validity of the study, and a pilot study was conducted at Kisumu National Polytechnic and Meru National Polytechnic, outside the study area.

### Data Collection Procedure

The questionnaire developed was presented to the targeted sample population for data collection.

### Data Analysis

Data collected for the study were analyzed using a descriptive method. Quantitative data was sorted, coded, cleaned, analyzed, and presented in the form of frequency tables, bar graphs, and pie charts. Data quality

checks were done in order to eliminate errors or points of contradiction in the data. The purpose of coding was to classify responses to questions into meaningful categories so as to bring out their essential pattern. Descriptive and inferential statistics were used in data analysis.

### Pilot Testing

The instrument was pre-tested by administering it to a sample of respondents not included in the study. This ensured its reliability as well as enhancing its usability and clarity of items. The instrument was then reviewed to ensure the alignment of the data collected with the objectives of the study. This, in turn, enhanced the validity of the instruments and ensured that all errors were eliminated.

## Results Findings

### The Role of Industry in the CBET Curriculum Development Process in Nyandarua National Polytechnic

According to main objective of the study, the following were identified as some of the roles of industry in CBET curriculum development process in Nyandarua National Polytechnic; Informing NyNP on relevant training gaps within the industry, development of occupational standards for different CBET programmes, monitoring standards on the development of the occupational standards, play advisory role in curriculum development process and providing training opportunities including apprenticeship, industrial attachment and internship for trainees and trainers among many others.

### Industry Experts' Views on the Role of Industry in the CBET Curriculum Development Process

Table 1 below shows results obtained from respondents on the role of industry in the CBET curriculum development process. The responses were drawn from four statements and presented in terms of Likert scale Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD) as shown below.

*Table 1: Role of Industry in the CBET Curriculum Development Process*

	Statements	SA	A	N	D	SD
1	There are indeed training gaps between industry and TVET Institutions	86.79%	5.66%	1.89%	3.77%	1.89%
2	Industry plays a critical role in development of occupational standards (OS)	47.17%	33.96%	3.77%	9.43%	5.66%
3	Monitor standards development of occupational standards	22.64%	41.51%	5.66%	26.41%	3.77%
4	Industry plays an advisory role in curriculum development process	15.09%	47.17%	9.43%	16.98%	11.32%

According to the results of the respondents' opinions on the role of industry in the CBET curriculum development process in Nyandarua National Polytechnic. About 46(86.79%) of the respondents strongly agreed, with 3(5.66%) agreeing with statement that there are training gaps between industry and TVET institutions. 1(1.89%) of respondents had a neutral opinion, while 2(3.77%) and 1(1.89%) of the



respondents disagreed and strongly disagreed, respectively, on a similar opinion on the role of industry in the CBET curriculum development process in Nyandarua National Polytechnic.

The study sought to determine how industry plays critical role in development of occupational standards (OS) 25(47.17%) of the respondents strongly agreed with 18(33.96%) agreeing with the statement while 2(3.77%) of the respondents in their view held neutral opinion while on the other hand 5(9.43%) and 3(5.66%) disagreeing and strongly disagreeing with statements.

Following the respondents' views on monitoring development of occupational standards, it was noted that 12(22.64%) strongly agreed and 22(41.51%) agreed with the statement that while 3(5.66%) of the respondents weren't sure on their response, while 14(26.41%) disagreed with 2(3.77%) strongly disagreeing with the same statements indicating that it's not the role of industry to monitor the development of the development of occupational standards but rather it involves the input of all stakeholders.

About 8(15.09%) of the respondents on their views strongly agreed with 25(47.17%) agreeing that industry plays an advisory role in the curriculum development process, to address the industry demands, hence producing fully baked graduates that match the industry needs and demands. The 5(9.43%) of the trainers had neutral opinion while 9(16.98%) disagreed, with 6(11.32%) strongly disagreed with the statement.

## Research Findings

The following were the findings obtained from the study.

- It was determined that there is a large training gap and mismatch between industry and TVET institutions
- There is a need to promote knowledge, skills, and worker behavior to meet industrial demands at Nyandarua National Polytechnic.
- It was found out that industry also plays a critical role in the development of occupational standards, which in turn match different skills in the industry.
- It was reported that the industry plays a key advisory role in informing different stakeholders in the curriculum development process
- Finally, it was found out that CBET addresses the industry demands by providing trainees with the requisite knowledge, skills, and attitudes required in the industry

## Conclusion

In conclusion, the study found the role of industry in the CBET curriculum development process in Nyandarua National Polytechnic. Through engagement with industrial experts, it was acknowledged that there is a need to address the mismatch that has been witnessed, and it's the responsibility of all stakeholders to develop a curriculum that is skill-oriented and knowledge-based to assist in bridging the existing gap within the Job market.

## Recommendations

Based on the findings of the study, the following recommendations were suggested:

- The industry should be fully involved in the CBET curriculum development process as the plays a key role in designing the industry's needs

- TVET institutions to develop frameworks that will see them train for the industry, to the industry, and in the industry.
- More trainers should be equipped with skills in Competency Based Assessment (CBA) to ensure effective delivery in terms of knowledge, skills required for training, and assessment of CBET
- TVET institutions, in collaboration with different industry stakeholders, to develop a policy that will see trainers retooled to attain the necessary skills required in training CBET.

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