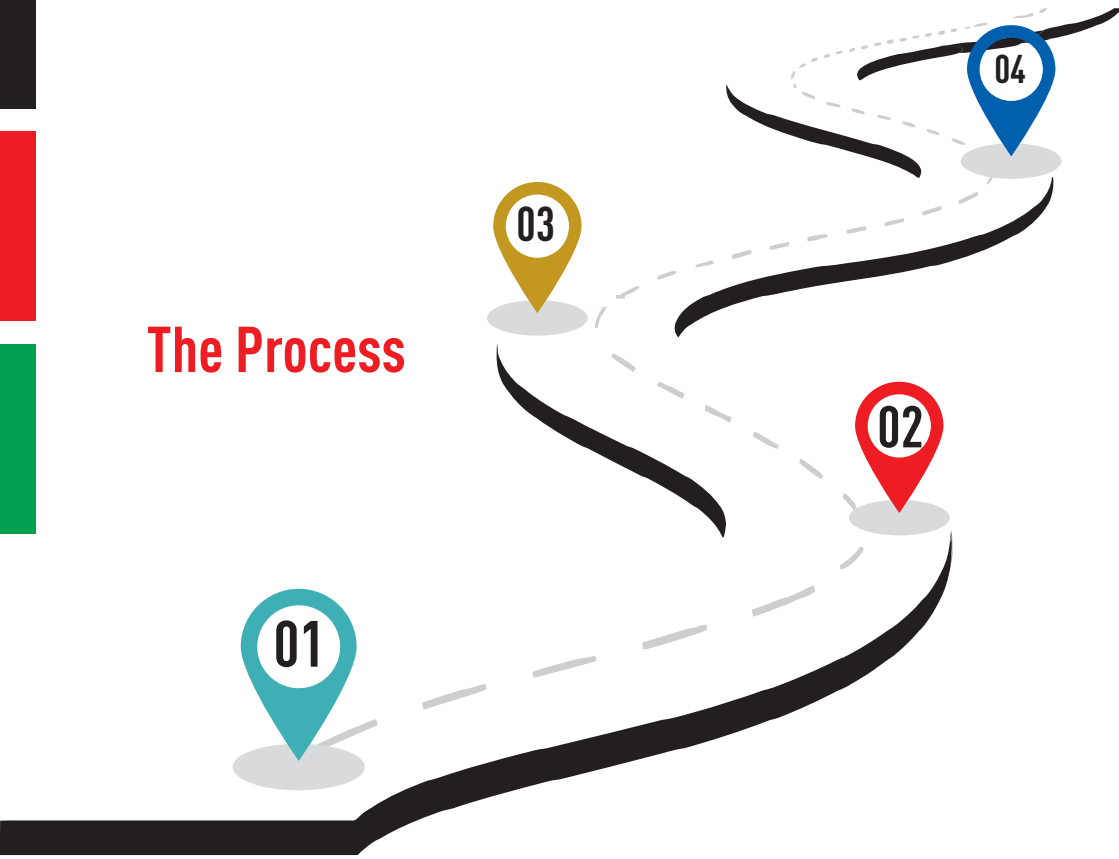
Republic of Kenya

MAPPING TECHNICAL AND VOCATIONAL EDUCATIONAL AND TRAINING DATA IN KENYA



The Process

DATA MAPPING MAY 2022

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1. Introduction

As the African population experiences rapid growth in the number of young people aged below 34 years who are expected to be about 0.5 billion by 2050, there is a need to ensure that more Sub-Saharan African (SSA) youth have access to education and training which has now seemingly become more challenging (The World Bank, 2015). Further, there is a sharp increase in the number of skilled unemployed youths who cannot find jobs in the formal sector that matches their skills in the region (Roubaud & Torelli, 2013). The governments in the region are therefore grappling with the challenges posed by the growing mismatch between investments in education and training, and the availability of real employment opportunities. Failure to resolve this is likely to see SSA governments not able to take advantage of the present youth demographic dividend. Tackling these demographic dimensions requires quality and timely data and information for decision making and programme implementation.

In SSA, access to microdata on education and training is a fundamental aspect of enlightening educational outcomes; however, this is still limited, resulting into a little contribution to world's research (Blom et al., 2016). In areas where data exist, it is problematic for scientists and policy analysts to gain access to crucial data. Besides the mentioned primary data research, analysis in the education field remains costly and often beyond available financial resources, thus limiting the availability of information on education in SSA. Sustainable Development Goals 4 (SDG-4), adopted by the United Nations as part of Agenda 2030 for Sustainable Development, aims to "ensure inclusive and equitable quality education, promoting all-time learning opportunities for both deserving and undeserving communities". To ensure the realization and effectiveness of this SDG-4, numerous education-related targets and indicators have been identified, which require regular assessment targeting data-based analyses in the education system, and educational attainment and policies,

especially in developing countries.

Strategies employed to unlocking patchwork of data that have been collected for baseline evaluations, empirical research, landscaping studies and feasibility assessments are poised to give decision makers a better picture of the state of education and training in their countries. Further, access to the data has the potential of increasing the generation of relevant knowledge leading to growing local capacity for the analysis and production of outstanding policy-relevant studies on African countries. Mapping the landscape of education data available in Africa and sharing the latter to increase access to and use of data requires proper evaluation to ensure that the data satisfy certain quality criteria. Unlocking Data to Tell the Story of Education in Africa (Adam et al., 2020) attempts to answer a series of questions about the barriers to data sharing and about the quality and accessibility of qualitative versus quantitative data. Barriers to education research in SSA include stakeholders' misunderstanding of the importance of sharing data, the lack of coordination in the data sphere, low research capacity, and the absence of harmonized and comparable indicators.

TVET Data Mapping entails the process of tracing: managing the availability, usability, integrity and security of the data based on internal data standards and policies that also control data usage; while ensuring that available data are consistent, timely, and trustworthy to effectively inform policy formulation, monitoring and evaluation.

In Kenya, access and availability of micro-level data on education and training, especially in the TVET sector, is a challenge burred with several constraints of data unavailability, inconsistencies, incomplete data, and bureaucracy for one to access the data. These limit research, baseline evaluations, landscaping studies, feasibility assessments, and data-driven policy reforms. Further, the few datasets available are kept within the departments' storage devices such as laptops or online drives, which are accessible to only a few authorized persons. This is because there is no centralized data storage platform where all the departments can upload and store the datasets for easy access

by all the stakeholders.

Therefore, in an attempt to address these challenges and constraints, there is a need to capitalize on strong data management systems and to make the data available and accessible for further research. This can be done by deriving value from the data in the TVET sector by considering key thematic areas in the education and training sector of Access, Equity, Relevance, Quality and Governance. This will boost the country's target of achieving SDGs by 2030. Therefore, a data mapping exercise was important in providing the data and information needed to track, monitor and evaluate the TVET goals over time. This information needs to be regularly collected based on common and global indicators that facilitate impact measurement and that respect the privacy of individuals, as provided for in the Kenya Data Protection Act (2019).

The TVET data mapping task will therefore inform the implementation of SDGs and other education goals as contained in the following policies and initiatives in the country: National Education Sector Plan (NESSP); TVET Policy; TVET Strategy; Kenya Vision 2030; Medium Term Plan (MTP) IV; and Country Integrated Development Plans (CIDPS), among others. The TVET data mapped fall under the following thematic areas: access and equity; quality and relevance; assessment and accreditation; resources and utilization; and governance and management.

2. Data Mapping Approach

There are several approaches and techniques that can be used to map out data for a specific sector. For this TVET case, a detail description of the approaches used is discussed below.

Data Mapping

TVET data mapping involves the process of identifying and linking multiple datasets into a centralized database. The purpose is to identify and centralize data in order to improve researchers' access to quality data and favor the generation of high-quality evidence to inform policy.

Data, in this case, are sets of facts, figures, measurements, and other information that can be used to start conversations, gain knowledge, and make informed decisions. TVET data and knowledge were collated on TVET demand, supply, inputs, outputs and outcomes. These data are important because they help the TVET sector to make better decisions, understand the demand and supply of TVET, improve resource allocation towards TVET, identify research gaps, and make informed policy decisions. Therefore, a data mapping exercise was important in providing the data and information needed to track, monitor, and evaluate the TVET goals over time in the country.

An Overview of the Data Mapping Methodology

TVET data mapping exercise adopted a 3-step approach as discussed below.

Step 1: Online search for education datasets and identifying all data sources

The online search sought to exhaust secondary datasets collected and stored by the public institutes of statistics, national and international organizations, as well as data collected by Higher Education Institutions (HEIs), NGOs, research institutions, private providers of education and researchers. Some of the datasets collected and collated included:

a. Kenya National Bureau of Statistics (KNBS); national government and county governments sources, TVET MIS; among other public sources stored in their websites and data repositories.
b. International data sources (Microdata on education from International Organizations). These were sourced from international websites such as the World Bank and ILO.
c. Micro-level education data from NGOs, researchers and others. It involved the search and access to data stored in Microdata Libraries such as The World Bank Microdata Library, Afrobarometer, DataFirst, HDX, UK Data Service, and Harvard Dataverse, among others for relevance and quality. NGOs also fund data collection activities and several studies which produce large amounts of potentially rich data, most of which were not available online, thus inaccessible for empirical research.

Step 2: Screening empirical research for education data

This process aimed to identify datasets used in empirical research focusing on TVET. It followed the procedure of a systematic review searching for research papers, but in which the focus was on the TVET data used. The process involved:

a. Accessing the database of World of Science;
b. Searching the TVET-related research papers through the search query option; and
c. Refining the search result to relevant empirical research on TVET.

This process of refining the search result consisted of specifying the country, the publication years, and the research domains, among others.

a. Countries: The country (Kenya) the researchers focused on when mapping TVET data.
b. The publication years: The mapping focused on 2010–2022.
c. Research domains: "Social Sciences" was selected.

This process helps identify relevant research papers and data reports that will be used to produce knowledge, as well as the data mapping reports.

Step 3: County-level stakeholders and consultations

Country-level stakeholders' consultations were undertaken through a workshop. The list of stakeholders identified during the screening of the TVET data form provided a basis for stakeholder engagement and advocacy. The purpose of consultations with local education actors was to identify gaps and missing data; i.e., data needed for a clearer picture of the TVET system; data that had been collected but were not publicly accessible; and data that were needed, but that had not been collected yet. The consultations were also decisive in understanding why specific data were not accessible and the strategies available to make the data publicly available. These consultations were vital, not only in making useful data available for research, but also in understanding some barriers faced by public authorities in sharing data while learning about the types of data that have more influence in policy-making.

3. The Role of Public Authorities

The government has over the years invested in the TVET sector to address the issues of skills mismatch and unemployment; however, this intervention is weakly informed by evidence and research. This data mapping initiative provides approaches for effective data mapping and sharing for decision-making and policy formulation.

The data mapping exercise will therefore inform implementation of TVET sector programmes, policies and initiatives including: National Education Sector Plan (NESSP); TVET Policy; TVET Strategy; Kenya Vision 2030; Medium Term Plan (MTP) III; Country Integrated Development Plans (CIDPS); Sustainable Development Goals (SDGs); among others.

4. Formation of Technical Working Group

A technical working group comprising TVET stakeholders was constituted by the Principal Secretary, State Department for Technical and Vocational Training, and the Ministry of Education in February 2022 to facilitate strong participation and collaboration among the key stakeholders such as Directorate of Technical Education, Council of Governors, TVETA, KICD, CDACC, KNEC, Zizi Afrique Foundation, KIPPRA, KATTI, KNBS among others. The following institutions in the TVET ecosystem were represented in the TVET Data Mapping workshop held between 7th and 11th March 2022:

i. Ministry of Education; State Department for Vocational Training; Directorate of Technical Education (DTE)
ii. Teachers Service Commission (TSC)
iii. Directorate in charge of TVET trainers
iv. Directorate of Vocational Education (DVET)
v. Human Resources - Vocational and Technical Training
vi. Central Planning and Project Monitoring Unit-CPPMU-VTT
vii. Council of Governors
viii. Kenya National Qualifications Authority (KNQA)
ix. Kenya National Bureau of Statistics (KNBS)
x. Technical Vocational Education and Training (TVETA)
xi. TVET-Curriculum Development, Assessment and Certification Council (CDACC)
xii. Representative, Kenya Association of Technical Training Institutions (KATTI) (represents both public and private technical training institutions)
xiii. Representatives from Universities: Catholic University of East Africa (CUEA); Technical University of Kenya (TUK)
xiv. Kenya Institute for Public Policy Research and Analysis (KIPPRA)
xv. Zizi Afrique Foundation
xvi. Other relevant TVET stakeholders such as the Vali Technical Working Group

Tasks:

The Committee's role was to:

i. Strengthen the link between data, research, policy, and practice;
ii. Inform TVET research through a systematic collation of the body of knowledge, identification and discussion of knowledge gaps;
iii. Nurture evidence-based decision making in TVET; and
iv. Validate and disseminate data in TVET.

5. Outputs

The outputs from the TVET Data Mapping and Tracing exercise were:

i. TVET Data Ecosystem Report;
ii. TVET Knowledge and Key Highlights Report;
iii. TVET Data Mapping Process Report;
iv. Collation of TVET Data and Information into a drive – A Concept is being developed on setting up the TVET Knowledge Hub at the State Department for Vocational Training;
v. Implementation matrix for the various recommendations in the reports; and
vi. A workshop with TVET stakeholders.

6. Highlights on TVET Ecosystem

Demand and Supply of TVET Data

Demand for TVET data is increasing over time, as policy makers seek information and data to influence reforms and address among other issues, the rise in the number of young people exiting basic education and demanding training and preparation for the world of work. The increase in demand has been occasioned by increased job opportunities in the relevant sectors, and the enactment of the TVET Act, 2013, which made it easier to join TVET institutions. Other factors that contributed to an increase in demand include subsidized tuition fees, student loans, as well as sensitization and awareness creation, among others. Mostly, the data demand by the stakeholders is used to influence policy priorities, the country's agendas, data literacy, and equity initiatives among other uses.

The data supply chain involves the technological steps and human-involved processes that support the flow of data through the organizations: from their raw state, through transformation and integration, all the way through the point of consumption or analysis. The government plays a critical role in the production and supply of data. Some of the government roles include: facilitation of the processes of data production and supply through provision of both human and financial support, capacity building for the responsible personnel, conducting research on TVET, and through regulatory support to ensure safeguarding of data. Further, the government has the role of providing safe custody of data, and the sustainability of data management since it is a continuous process. In addition, stakeholders can also provide data through publications, dissemination workshops and public repositories.

TVET data tracing, collation, sources and usage

The ***production and management of TVET data*** is undertaken by various institutions such as TVET institutions, Technical and Vocational Education and Training Authority (TVETA), Directorate of Technical Education (DTE), County governments, Kenya National Bureau of Statistics, research entities such as the Kenya Institute for Public Policy Research and Analysis (KIPPRA), KUCCPS, HELB, UNESCO, VSO, Universities, other research institutions, civil society and Zizi Afrique Foundation among other institutions. There is currently no established mechanism for sharing the data collected and managed by these institutions and other researchers. In order to ensure easy access to information on TVET, there is a need to develop a central hub (proposed TVET Knowledge Hub) where the stakeholders can readily share and access information on TVET. This will enable the data gaps to be readily identified and filled.

Microdata relating to Technical and Vocational Educational and Training data in Kenya are difficult to access and for Kenyan researchers and policymakers, the collection of primary and secondary data is often far beyond financial resources. In some instances, the same datum is collected by various institutions, leading to duplication of effort and data inconsistencies. Unlocking the patchwork of data collected for administration, assessment, baseline evaluations, landscaping studies and feasibility assessments would give decision makers a full picture of the state of Vocational Educational and Training in Kenya Giving scholars and policymakers access to these data would not only increase the generation of locally relevant knowledge, but it could also be used to grow local capacity for analysis–enabling more researchers to produce outstanding publications, leading to more uptake of the evidence. Some of the identified data gaps were:

a. Lack of adequate information on enrolment in private institutions;
b. Inadequate information on catchment in relation to establishment of TVET institutions;
c. Lack of adequate information on transition to industry;

d. No information on Certification through RPL – Recognition of Prior Learning (RPL) and the on No. of certifications;
e. Inadequate information on skills and labour market surveys;
f. Inadequate data on value for money (no tracing of impact of TVET Initiatives);
g. Lack of data on TVET Differentiated Unit of Costs;
h. Limited data on CBET assessment results; and
i. Limited data on TVET Projections.

Lessons learnt

Lessons learnt in the process of identifying/tracing/listing/finding the datasets using the different approaches include:

a. The sector could be making some decisions without adequate evidence, given the existing data gaps;
b. There exists data on various thematic areas in some institutions which other stakeholders may not be aware of;
c. Getting quality, granular, timely and reliable data from institutions and agencies remains a challenge. Institutions were not sharing data they already had.
d. Use of obsolete data in certain instances which may not inform current policy issues.
e. Limited knowledge-management units in organizations due to limited human and capital resources.
f. Limitations in centralized data storage and systems for regular updating of data leading to such risks as: unstructured data collection; irregular data collection; data inconsistency; inaccuracy of data; fragmented data; non-uniformity in data collection; lack of personnel; failure to adopt ICT consistently and adequately in data collection; and processing and reporting.
g. Inaccessible data: data could be in manual filing systems hence not easily accessible.

Recommendations

To address the aforementioned challenges/barriers, the Committee recommended the following initiatives for implementation by the national and county governments, ministries departments and agencies, private sector and non-state actors in TVET sector:

Leveraging on strong collaborations, linkages & partnerships among the relevant TVET Data Ecosystem stakeholders to unlock TVET data in the country;

Improve collaborations between both National and County governments and non-state actors in TVET data management and utilization;

Deepen application and use of data in decision making processes;

Invest in mentorship and capacity building to enhance skills and capabilities in TVET data management at national and county levels;

Development of a central repository hub for TVET data (TVET Knowledge Hub);

Advocating for more knowledge generation for dissemination through the Kenya TVET Journal;

Mainstreaming learning and knowledge management into TVET data management in the existing TVET institutions;

Equipping of TVET institutions and effecting scheme of service for all TVET instructors;

Establishment of ICT-enabled knowledge management centres and data hubs across counties and learning institutions;

Supporting regular TVET knowledge-sharing forums;

Capacity building on data management (ensure data accuracy and consistency);

Adoption of ICT in data collection, analysis and sharing;

Developing key and uniform comprehensive tools, indicators for TVET data collection and production;

Having a central database for free access to TVET data;

Strengthening collaboration among entities in the TVET sector for better data sharing;

Capacity building of relevant individuals on data collection, analysis and reporting;

Establishment of a strong TVET M&E system; and

Establishment of knowledge management units in TVET institutions.

7. TVET Preliminary Highlights and Knowledge Gaps

Key highlights from the analysis of the available TVET data and knowledge include:

Enrolment: Enrolment in TVET and the number of TVET institutions has been increasing over the years. Total enrolment in TVET institutions grew from 142,418 in 2015 to 476,202 in 2020 with National Polytechnics and Technical Universities having the highest increase in enrolment.

Gender disparities: Despite an increase in TVET enrolment, gender disparities exist between the numbers of male and female trainees who attended the TVET institutions. In 2015, the number of male students in TVET institutions was 85,563 and grew to 258,084 by 2020. Female students' enrolment number increased from 56,855 in 2015 to 193,121 in 2020. The increase also indicates a change in the share of male students' enrolment and female trainees. The gender parity index (GPI), based on enrolment, moved from 0.66 in 2015 to 0.75 in 2020.

TVET institutions distribution: Evidence shows that although the number of TVET institutions grew by 10.3 percent to 2,235 in 2022, the institutions are not evenly distributed across the country. For instance, Bungoma, Kakamega and Murang'a counties had the highest concentration of vocational training institutions relative to population density while Nairobi, Kiambu and Nakuru counties had the lowest concentration of registered centres.

Special groups: In terms of enrolment for special groups, enrolment of trainees with disabilities in technical training is less than 4 percent of the total student's population while enrolment data on trainees in refugee camps are limited.

Approved Curricula: Data show that there are over 372 approved curricula for all the qualifications. In terms of approval of institutions to offer CBET curriculum, data show that there are 191 institutions given approval to roll out CBET courses by TVETA out of the 2206 registered. There are curriculum support materials developed for various courses.

As a measure to ensure **quality is maintained in training**, TVETA has licensed 1,820 trainers to assist in the implementation of the CBET curricula. These licensed trainers are from both private and public institutions.

To regulate **assessment** in training centres, there are 183 institutions which are registered as Assessment Centres.

Transition to the labour market: Transition to the labor market is assessed by the number of TVET graduates, the number of TVET graduates' employment and the number of the TVET graduates employed in their area of specialization. Majority of the TVET graduates are from secondary and primary schools at 49.1 percent and 39.4 percent respectively. Available knowledge shows that 43 percent of TVET graduates are working in the area they trained on while slightly more than a half (57%) are employed in the fields they did not train on. In terms of age distribution, graduates in the 25–34-year-age group had the highest proportion (34.8%) working in the area they trained on while graduates aged 55 years and above had majority working on areas they did not train on, with only 10.2 percent of the graduates being in the area they trained on. Overall, there are gaps in granular data and support systems for transition to the labour market.

Values and life skills: Available evidence identifies the need of focusing on Values and Life skills as they complement technical skills propelling whole youth development and business growth. Integrating values and life skills in the TVET sector is meant to make the acquisition of skills easier and also make those who get such skills more adaptable to the work environment thereby enhancing youth employability. Available knowledge shows that most TVET graduates were good team players while the highest mismatch was recorded in digital skills.

Physical Infrastructure: Knowledge of level of physical infrastructure development in TVET institutions, is crucial for relevant stakeholders to enable optimal resource acquisition and utilization. In TVET, physical infrastructure includes lecture halls, workshops, production units, accommodation and catering, administrative blocks, laboratories and sanitation facilities. Data on

TVET physical infrastructure are rarely disaggregated for easy accessibility.

Financing: TVET institutions receive most of their financing from the government (national and county governments). The contribution of the government allocation to the total budget has however, been fluctuating over time, with the highest contribution recorded in 2016/17, representing 88.2 percent, and the lowest contribution at 47.7 percent in 2017/18. The development partners' contribution has also been declining since 2016/17, from KES 7 billion to KES 2.4 billion in 2021/22. Nevertheless, the revenue from appropriation-in-aid has increased since 2018/19, from KES 23 million, to KES. 4.6 billion in 2020/21. Data on TVET financing by non-state actors (off-budget support) were not accessible.

Equipment: Training equipment availability in a TVET institution is informed by training content, module sequence and occupational profiles.

Governance: Governance and management in the TVET and training focuses on the rules and mechanisms for decisions and accountability. Governance and management of the education sector is guided by the Constitution of Kenya 2010, with the overall leadership vested in the ministry responsible for education training and research. In this space, the Ministry works closely with county governments to ensure effective and efficient delivery of services. The management of vocational training centres (which constitute about 57 percent of TVET institutions) is under county governments. At the institutional level, management is delegated to Boards of Management, Boards of Governors, Governing Councils and Boards of Trustees. Boards for Vocational Training Centres are appointed by the respective county governments.

In TVET there are a number of emerging issues. For instance, with the advent of Covid-19, e-learning has become a critical delivery tool. Another emerging issue is the rapid growth of digital economy requiring the development of digital skills. Some of the identified knowledge gap areas requiring further work were:

i. Establishment of TVET Knowledge Hub at the Ministry;

ii. TVET Unit Cost Analysis and Deepening Income-Generating Activities (IGAs)
iii. Full implementation of Kenya TVET Skills Gateway
iv. Considering design and administration of a Comprehensive TVET data collection tool for all TVET Institutions (public and private) to be administered annually and a "TVET Status Report" produced on an annual basis.
v. Investing Resources for Secondary Data Analyses (that is synthesis of findings and recommendations from the Mapped TVET Journals, Documents and Reports).

8. Work Plan

Details on activities and workplan for implementing the TVET Data Mapping in Kenya are presented in Table 1.

Table 1: Work Programme and Timeline

No	Activity	Timeline	Stakeholders
1	Constituting technical committee comprising relevant institutions.	October 2021	MOE in collaboration with key stakeholders
2	Technical committee inauguration; Development of prototypes and procedures for TVET data mapping; and Communication to request for TVET data from various institutions with TVET data	October 2021	Technical committee in collaboration with key stakeholders
3	Desktop and online review to identify: i. Existing data on TVET ii. Classification of the data under major TVET themes which includes but not limited to a. TVET Access and Equity, b. Quality, c. Relevance, d. Resources (Physical, Human and Financial), e. Governance and management environment iii. Gaps in the TVET data and knowledge	November 2021 – January 2022	Technical committee in collaboration with key stakeholders
4	Presentation of the desktop and online review data and findings to the technical committee for comments and adoption, validation, and dissemination	February 2022	Technical committee in collaboration with key stakeholders
5	Development of the final reports on: i. TVET data ecosystem; ii. TVET data knowledge and highlights; iii. TVET data mapping process; and iv. TVET dataset	March 2022	Technical committee in collaboration with key stakeholders

9. Lessons Learnt in Mapping TVET Data and its Ecosystem in Kenya

i. Getting quality, accurate and reliable data from institutions and agencies was challenging. This was occasioned by lack of a public central repository site for TVET data and information. Further, the existing data in the publications were in some cases inconsistent (varied across the reports) and were not up-to-date or real-time data.

ii. Some institutions were reported to be unwilling to share data hosted in their offices because of bureaucracy and policies put in place.

iii. The data collected and stored in some formats were obsolete data in certain instances, hence they were not useful to inform current policies.

iv. Irregular data collection constraints, the use of prediction models to inform on the policies. Some data indicators were not updated yearly unless and until when collected through a survey.

v. Some datasets were fragmented into many pieces that were not close together. This was typically the result of attempting to insert a large object into storage that has already suffered external fragmentation.

vi. Non-uniformity in data collection, especially on the units of measurement made it difficult to predict trends and inform on policies.

vii. Unstructured data collection was also a main challenge, considering the datasets were collected across different data collection points and expected to be merged into one central repository.

viii. Lack of personnel and limited skills for data collection and management. The development and management of data collection across the TVET institutions required skilled professionals with skills in data collection, processing, analysis and management to ensure an accurate dataset was produced.

ix. Failure to adopt ICT in data collection. With the trend in big data collection and management, TVET was yet to adopt an ICT approach in data collection, management, and utilization.

x. Inaccessible data was still a major challenge and constraint in data collection and compiling since some datasets could be in manual filing systems.

xi. Lack of knowledge management units in organizations due to limited human and capital resources.

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