GENERAL DIRECTORATE FOR VOCATIONAL TRAINING
National Institute for Vocational Training

GUIDELINE FOR SUSTAINABLE DEVELOPMENT OF TVET REPORTING IN VIET NAM

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Abbreviations

BIBB	German Federal Institute for Vocational Education and Training (Bundesinstitut für Berufsbildung)
CIM	German Centre for International Migration and Development
GDVT	Vietnamese General Directorate for Vocational Training
GIZ	Gesellschaft für internationale Zusammenarbeit GmbH
GSO	Vietnamese General Statistical Office
ILO	International Labour Organisation
ILSSA	Vietnamese Institute of Labour Science and Social Affairs
MOET	Vietnamese Ministry of Education and Training
MoLISA	Vietnamese Ministry of Labour, Invalids and Social Affairs
NIVT	Vietnamese National Institute for Vocational Training
PVT	Programme Vocational Training 2008 of GIZ
RWI	Rheinisch-Westfälisches Institut für Wirtschaftsforschung

1 Introduction

1.1 Goals and Target Audience

This guideline is intended primarily for researchers working at the National Institute for Vocational Training (NIVT) in Viet Nam. It provides direction for the researchers for generatingTVET reports within the frame of the ongoing development of a TVET monitoring and reporting system in Viet Nam. In the context of trilateral cooperation between BIBB, NIVT/General Directorate for Vocational Training (GDVT) and "Gesellschaft für internationale Zusammenarbeite" (GIZ), – Programme Reform of TVET in Viet Nam, this guideline is an instrument for capacity development in the German-Viet Namese TVET partnership. It builds on the experience base and exigencies of the advisory process since 2010 for establishing a sustainable TVET monitoring and reporting system, and they address the primary consultancy content, namely qualification requirements, project management and indicator development.

The guideline reinforces the knowledge transferred during the advisory process and facilitate familiarisation for new researchers at NIVT. The principal organisational factors and basic knowledge needed to generate TVET reports in Viet Nam are presented as a "one-stop shopping" hands-on guide written in a clear, understandable format. In addition, tips and recommendations are provided on how to build on previous results and continue with implementation of TVET reporting in Viet Nam. The guideline is based on the following:

- Presentations and reports from joint BIBB, NIVT and GIZ workshops on establishment of TVET reporting in Viet Nam (see BIBB 2012; BIBB 2011)
- Concepts and evaluation reports developed during establishment of TVET reporting at NIVT (see GDVT/GIZ 2014, Horn 2014a, Horn 2014b, Horn 2012a, Horn 2012c)
- Examples from German vocational training reporting over the past five years (see BIBB 2014a; BIBB 2014b; BIBB 2013; BIBB 2010a)
- Examples from the first two Vietnamese TVET reports and comments on the reports submitted by BIBB, the CIM expert at NIVT and GIZ (see National Institute of Vocational Training 2012 und 2013b)
- Experience gained from programme work in the frame of the *Vietnamese-German Programme Reform of TVET in Viet Nam*
- Reports on current TVET-related development trends in Viet Nam
- TVET and empirical social and evaluation research literature
- Tracer studies and company surveys

1.2 Trilateral BIBB-NIVT-GIZ Partnership

Since 2010, BIBB along with GIZ has been providing advisory services in Viet Nam to support the establishment of a sustainable TVET monitoring and reporting system. Since 2006, the partnership has been based on a trilateral cooperation agreement between BIBB, GIZ and NIVT (part of GDVT which itself is a subordinate agency of the Vietnamese Ministry of Labour, Invalids and Social Affairs (MoLISA)).

Specifically since 2010, the efforts have been directed at strengthening the capacities to develop TVET reports. Vietnamese TVET reports for 2011 and 2012 have been published so far. TVET report 2013/14 is being published at the end of 2015.

During the development of the reports, content and organisational support was provided by the *Vietnamese-German "Programm Reform of TVETe in Viet Nam", technical cooperation implemented by GIZ,* on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). An integrated expert provided TVET sector monitoring support to NIVT for nearly three years as part of the Programme. The NIVT researchers and GDVT staff received ongoing advice from BIBB and the GIZ *Vietnamese-German Programme Reform of TVET in Viet Nam* on

- the legal basis and institutional framework for sector-specific monitoring and reporting
- identification of GDVT/MoLISA information needs
- identification of additional key contributors to the reports in the Vietnamese TVET system
- identification of central TVET management issues
- content structuring of TVET reports
- indicator development
- data processing and analysis
- layout, presentation of the findings and quality control for TVET reports
- development of specific focal topics such as competency standards and the conceptual design and execution of cost/benefit analyses

During the pilot phase, the main emphasis was on the composition of the institutional framework. Action was undertaken to ensure that the researchers at NIVT have the necessary skills, particularly for indicator development. Support was also provided for creation of project management structures, specifically a project group for ongoing oversight of TVET reporting.

Advisory services took the form of semi-annual workshops in Viet Nam as well as researcher exchange, study visits to BIBB and video, Skype and teleconferencing. BIBB, GIZ and the integrated expert at NIVT submitted comments on the quality of the draft reports for 2011 and 2012 which

were generated by NIVT. These reviews included quality improvement recommendations.
The first Vietnemese TVET Report of the year 2011 was presented at the *regional BMZ and MoLISA TVET conference* in October 2012 in Hanoi. The presentation was given in Vietnamese and English, and Prof. Esser who is the President of BIBB attended the event. The TVET Report 2012 was presented to regional vocational education professionals at the second regional BMZ TVET conference in Jakarta at the beginning of April 2014. The English version was published in June 2014.

Building on the skills acquired by NIVT researchers through advanced training and coaching and following the formation of an NIVT project group, NIVT generated the third TVET Report largely on its own. BIBB and GIZ consultancy was limited to submission of comments on the draft TVET Report and specific up-skilling for NIVT researchers on an as-needed basis, with particular emphasis on *cost/benefit analysis*. In the future, TVET reporting consultancy will be concentrated on the specific focal topics, quality enhancement and comments on the draft reports.

1.3 Vocational Education and Training Reporting in Germany and Viet Nam

1.3.1 Introduction: What is vocational education and training reporting?

The term *vocational education and training reporting* refers to ongoing data acquisition, analysis, formatting and publication of the findings in analytical *vocational education and training reports* which provide the data needed to improve policy decision-making and gain a better insight into the effectiveness of the vocational education and training system (see BIBB 2012, BIBB 2010b). Ideally, vocational education and training reporting is based on a systematically designed monitoring system for the vocational education and training sector with defined data transfer paths, defined responsibilities for data analysis and formatting and defined reporting channels. With these reports in hand, policy makers can proactively address foreseeable trends, anticipate future developments and identify the need to make policy decisions and take specific action (see Milde 2011, p. 56). In these guidelines, the terms *reporting*, *vocational education and training reporting*, *VET reporting*, *TVET reporting* and the *reporting system* will be used synonymously.

1.3.2 Vocational Education and Training Reporting in Germany

The establishment and use of vocational education and training reporting depends to a very significant extent on the will of political decision makers. The political will in Germany is expressed very clearly in the statutory basis for vocational education and training reporting. Section 86 of the German Vocational Training Act (BBiG) stipulates that the Federal Ministry of Education and Research (BMBF) is responsible for continually monitoring developments and trends in vocational education and training and presenting a report (vocational education and training report) to the Federal Government on April 1st of each year. The current state of vocational education and training as well as foreseeable future developments shall be presented in the report. If the balanced availability of apprenticeship places across regions and sectors appears to be jeopardised, the report shall contain recommendations for rectification (BBiG 2005, Section 86, Paragraph 1).
The political will is also expressed in the willingness of the Federal Government to ensure and continually enhance quality in the education and training system on the basis of sound scientific research and in doing so to create a framework for reliable assessment of the future outlook and opportunities in the education and training system (www.bundesregierung.de/Webs/Breg/DE/Themen/Bildung/Schulbildung/bildungsforschung/_node.html, version: 11/01/2015).
In Germany, BIBB has responsibility for acquisition, analysis and formatting of the data and for publication of a data report for the vocational education and training reports (see Friedrich/Krekel 2010). Since 2009, the reports are subdivided into the vocational education and training report and the accompanying data report. There shall be a clear separation between a political section which is deliberated on and approved by the Federal Government and a non-political section for which BIBB has responsibility ww.bibb.de/dokumente/pdf/empfehlung_123_neustrukturierung_berufsbildungsbericht.pdf, version: 11/01/2015). The vocational education and training report (Berufsbildungsbericht) contains political analyses and decisions drawn up by BMBF with the support of BIBB. The report presents the Federal government's goals, statutory framework and vocational education and training priorities. The report also sheds light on current developments and challenges in vocational education and training, demographic change being one example. As stipulated by law (BBiG, Section 86), the situation in the vocational education and training market is presented and commented on in the annual vocational education and training statistics. Education policy measures and programmes as well as European and international vocational education and training cooperation are discussed. Finally, the report contains representations by various parties involved in vocational education and training policy (incl. the BIBB Steering Committee).
BIBB generates the VET Data Report which accompanies the vocational education and training report for which it forms the basis. The VET Data Report is divided into five chapters which provide information on vocational educatio and training indicators (Chapter A), continuing vocational and training development (Chapter B), one major topic (Chapter C), programmes and model initiatives (Chapter D) and international indicators and benchmarks (Chapter E). When the concept and basic thrust of the VET Data Report

in Germany were defined, it was clear right from the start that vocational education and training reporting in Germany should be based on suitable indicators. As a result, the VET Data Report has become a standard vocational education and training reference in Germany (see Friedrich/Krekel 2010). The underlying and highly informative indicators are kept up to date, and they along with the (assessment) tools and analysis methods are continually being fine-tuned and enhanced (ibid.).

1.3.3 Vocational Education Reporting in Viet Nam

The Vietnamese economy remains on the growth curve. The process of regional and international economic integration continues, and there is an increasing need for adequately qualified workers. With this in mind, the Vietnamese government has identified labour force development, and in particular the effectiveness of the TVET sector, as a key factor in the country's continued economic and social development (see Socialist Republic of Vietnam 2012). This is clearly reflected in the Vietnamese government's current political roadmap, particularly the 2011-2020 TVET strategy (ibid.). Political prioritisation of TVET is only meaningful if a sound information base backed up by reliable data exists to support the vocational education and training decision-making process. The availability of more informative data to support TVET decision-making will increase the effectiveness of the Vietnamese vocational education and training system, in particular its practical, demand-orientation. The goal of the partnership between BIBB, NIVT/GDVT and GIZ discussed in Section 1.2 above is the establishment of a sustainable monitoring and reporting system for the vocational education and training sector in Viet Nam.

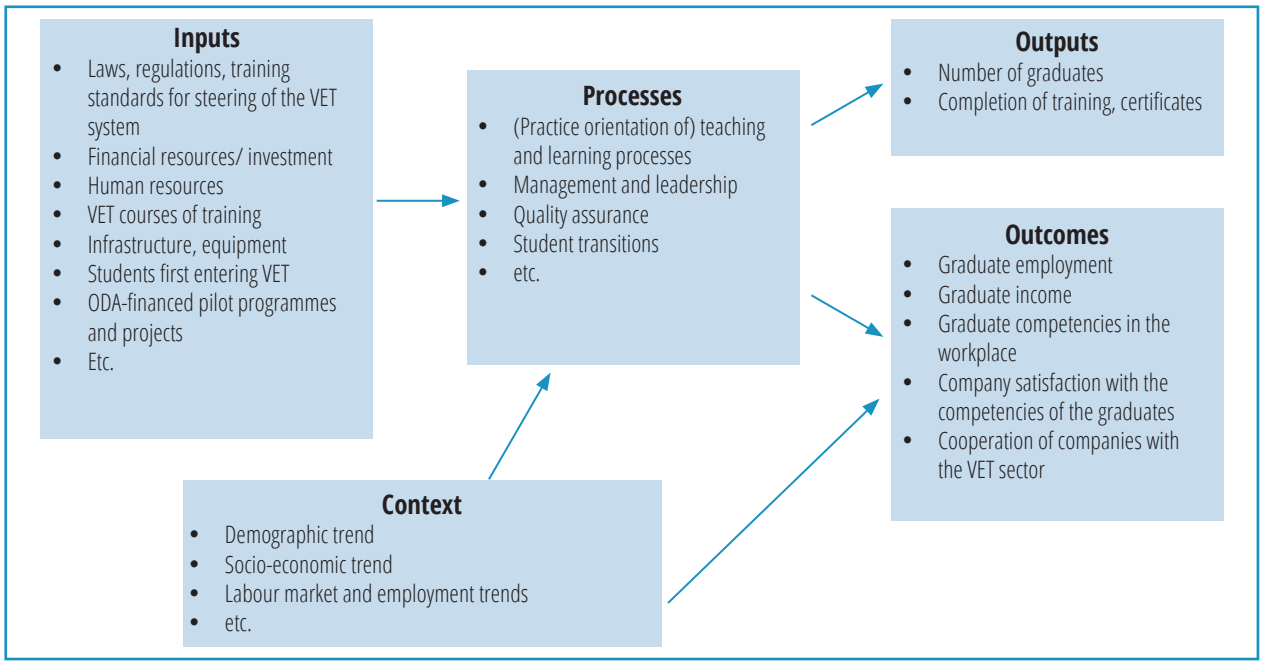
With the support of the Integrated Expert, NIVT created a conceptual design for the TVET sector monitoring system in Viet Nam. Figure 1 shows the TVET dimensions relevant for steering as defined in the conceptual design based on the goals set out in the Vietnamese 2011-2020 TVET strategy and on current international vocational education and training reference literature.

Figure 1 shows the priorities set by the Vietnamese government to enhance the effectiveness of the TVET sector. The priorities are directed at processes and outcomes, in particular

- Up-skilling of teaching staff and updating of educational material, facilities and equipment in order to improve the *teaching and learning process*
- *Improvement of TVET management* in Viet Nam
- *Transition management* based on incentivisation
- *Greater collaboration* between Vietnamese companies and the TVET sector, and higher satisfaction in the business sector with the competencies of TVET graduates
- Improvement in the *employment situation* of TVET graduates, particularly in terms of *income* and *competencies* (see Socialist Republic of Vietnam 2012; Horn 2014a).

The establishment of the TVET reporting system in the years ahead will be accompanied by development of a systematic TVET monitoring system for this domain. Reports will be generated providing information on the Vietnamese government's political decisions, goals, statutory policy and vocational education and training priorities along with relevant data for the different sectors.

Figure 1: Dimensions of the TVET sector relevant for steering



Sources: HORN 2012C, p.10, based on ARNOLD/FABER/WIECKENBERG 2002, p.112ff., BIBB 2010, p.214ff., DÖBERT et al. 2009, p. 241, HORN 2011, p. 81ff., REICHART/MÜHLHEIMS 2012, p. 31)

2 Implementation of sustainable TVET reporting in Viet Nam

The following factors are absolutely essential for establishment of a sustainable indicator-based TVET reporting system in Viet Nam:

- Active political engagement, making it possible to identify and address problems and develop solutions
- Institutional embedding in the Vietnamese vocational education and training system; this includes the establishment and utilisation of appropriate administrative structures and defined reporting paths which make data exchange and information sharing a win-win situation for everyone involved
- Inclusion of all stakeholders (social partners: workers' and employers' representatives, central and provincial government, other sectors of the education system (in particular MoET which is responsible for general and vocational education and training), research institutions, educational institutions, etc.)
- Establishment and utilisation of an organisational framework for TVET reporting at NIVT, in particular the formation of internal and external working groups to facilitate information sharing (information management)
- The availability of staff with the necessary skills acquired through staff training and development, etc.
- Access to data held by other organisations (e.g. the Vietnamese General Statistical Office) for data synthesis, indicator computation and (new) indicator development
- Database creation and maintenance to support transparent data management
- As needed, collect own data, carry out own surveys and create own data sources which meet established quality standards

In the sections which follow, the organisational and skill requirements as well as the involvement of other entities are presented in greater detail.

2.1 Organisational Requirements

2.1.1 Institutional embedding

Establishment of the necessary structures and processes needed to support regular reporting over the long term at NIVT and acquisition of the skills necessary to work efficiently within these structures and workflows by the researchers involved were desired outcomes of the pilot phase of the implementation of TVET reporting.

The pilot TVET reports 2011 and 2012 were generated based on project proposals submitted by NIVT to GDVT. With advice from BIBB and GIZ, NIVT drew up the proposals and submitted them to GDVT. Approval of the proposals gave the green light to generation of the reports. BIBB and GIZ provided support in the form of *capacity development* for NIVT staff. During generation of the first two reports, NIVT had little opportunity to establish permanent, formalised data flow and reporting paths. Article 2, Paragraph 3 of the Vocational Education Development Strategy 2011-2020 stipulates that MoLISA shall work together with other ministries, e.g. MoET, on monitoring and implementation of the strategy (see Socialist Republic of Vietnam 2012). There was little evidence of this collaboration during the pilot phase (see p. 18ff). An essential prerequisite for further successful implementation of TVET reporting in Viet Nam is institutional embedding at GDVT/MoLISA, superseding the project status and ensuing regular reporting on a permanent basis.

2.1.2 Organisational implementation at NIVT – project management

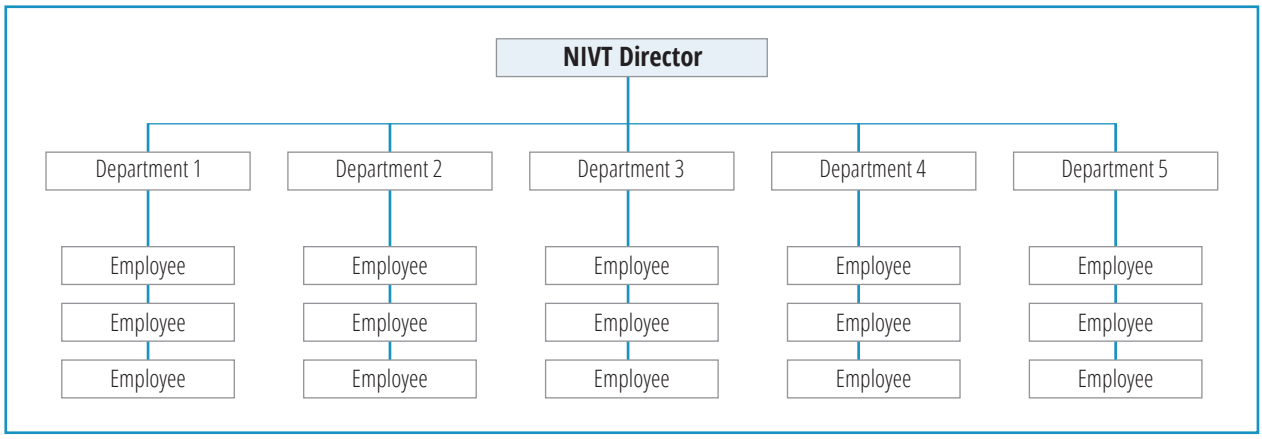
NIVT is a department within GDVT and it works primarily on contract, project and applications based vocational education and training research. One of NIVT's responsibilities is to make current data and research results available to GDVT to support evidence-based management of the vocational education sector in Viet Nam. To help with fulfilment of this responsibility, the relevance of TVET reporting was discussed with NIVT and GDVT/MoLISA, and agreement was reached to generate pilot TVET reports in Viet Nam. Working in partnership with BIBB and GIZ, NIVT will develop the capability to generate future TVET reports on its own and further enhance TVET reporting in Viet Nam. NIVT is a line department of GDVT.

It is structured as a line organisation with 8 departments working under the NIVT top management level.

a. Competency Development and Training Standards Department
b. Labour Market Research and Labour Market Trend Forecasting Department
c. TVET Policy Research Department
d. Training Programme Development and Evaluation Department
e. Curriculum Research and Instructional Science Department
f. International Relations Department
g. Administration Department
h. Bookkeeping and Finance Department

Because the TVET reports covers a very broad spectrum, the expertise of researchers in many different departments at NIVT is needed to generate them. The advisors along

Figure 2: Organisational structure of NIVT



Source: Own data

with NIVT set up a project structure for generation of the first two TVET reports (see Figure 3) to take this factor into account. The principles of project management, which were shared with NIVT as part of the advisory services, are discussed in the following sections.

Projects and project management

Besides the essential organizational framework (see Paragraph 2.1), *internal project management at NIVT* is a crucial factor for establishment of sustainable TVET reporting in Viet Nam. TVET reporting at NIVT has been structured as a project up to this point. The approach taken is outlined below along with the recommended method for directing and effectively managing the project in the future.

Projects exist in many organisations and fields of activity and at varying levels of complexity. Although they are defined differently depending on the context, projects normally share the following characteristics:

- Projects are timebound and have defined goals (vision, concept, execution). Special resources (expertise, people and financing) are needed to achieve the goals.
- Projects involve innovation, and new knowledge and organisational structures are needed to execute them.
- Projects are complex, because different disciplines and organisational entities are normally involved and they usually impinge upon existing line organisation structures.
- That makes projects difficult to plan and manage, and special management skills are needed to succeed (see Kuster et al. 2011, p. 4).

The term *project management* refers to all planning, monitoring, coordination and control activities needed for initial project planning, process adaptation and problem resolution (ibid. p.7). The success of the project management function depends on the project manager, who has essentially the following four responsibilities (ibid. p.9):

- Goal definition and project organisation: At the start of projects or project phases, project committees must be appointed or membership reviewed, project teams must be formed or membership reviewed based on functional, organisational or social criteria, and the rolls and responsibilities of everyone working on the project must be defined or reviewed.
- Project schedule: To facilitate task and time planning, project schedules must be generated at the start of projects or project phases which provide a realistic timeframe for project team activities and results (or partial results).
- Staff development and teamwork: In addition, project members must be assigned and if necessary trained to complete the tasks assigned. It is important to maximize teamwork and avoid or manage possible conflicts, and consideration must be given to how this will be accomplished.
- Tools & instruments/knowledge management: The necessary technical tools must be put in place to guarantee goal achievement. For the establishment of TVET reporting, this means in particular the creation of databases containing all relevant data which must be continually maintained and updated.

These four tasks will now be discussed in greater detail.

1: Goal definition and project organisation

Generation of the annual TVET reports in Viet Nam is organised as an annual project at NIVT. Most of the operating departments at NIVT are involved in the project. The projects have been embedded into the NIVT organisational structure as follows:

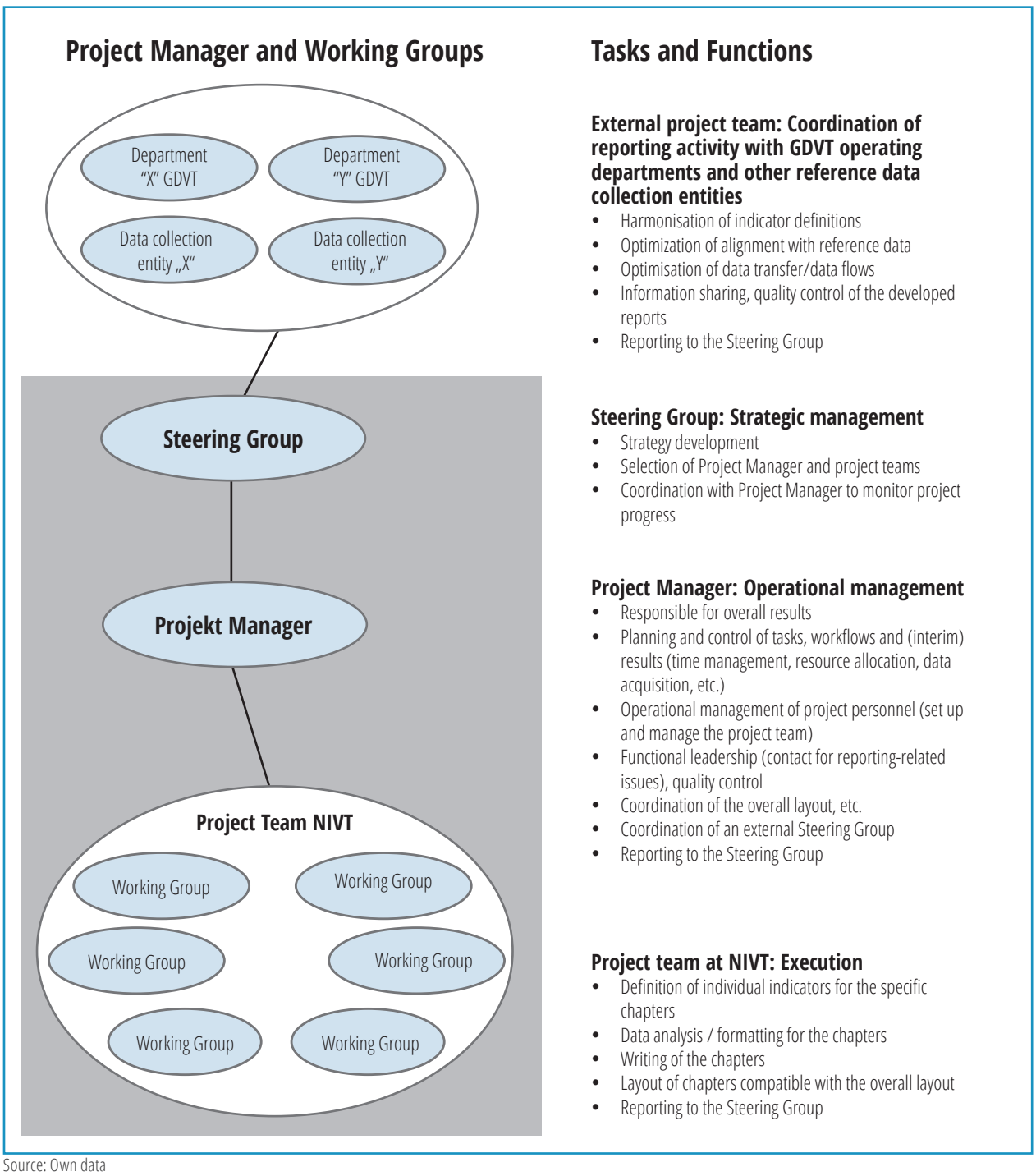
- Goals, in particular those pertaining to content structuring and organisational implementation of the TVET reports, have been defined and agreed with the key stakeholders in the Vietnamese vocational education system.
- A Project Manager and a Steering Group were appointed; the Project Manager and NIVT Director (see Figure 4)

are permanent members of the Steering Group.

- Tasks were derived from the goals and target completion dates were set, in particular identification of the information needs, definition of the key items to be addressed, development of a reporting structure in order to define the content horizon and creation of a plan for data access and analysis and for organisational implementation of the reports
- Employees from the various operational departments were assigned to (project) work groups which form the internal NIVT project team; the project team members assume responsibility for specific topics and chapters in the TVET reports and follow through on the groundwork.

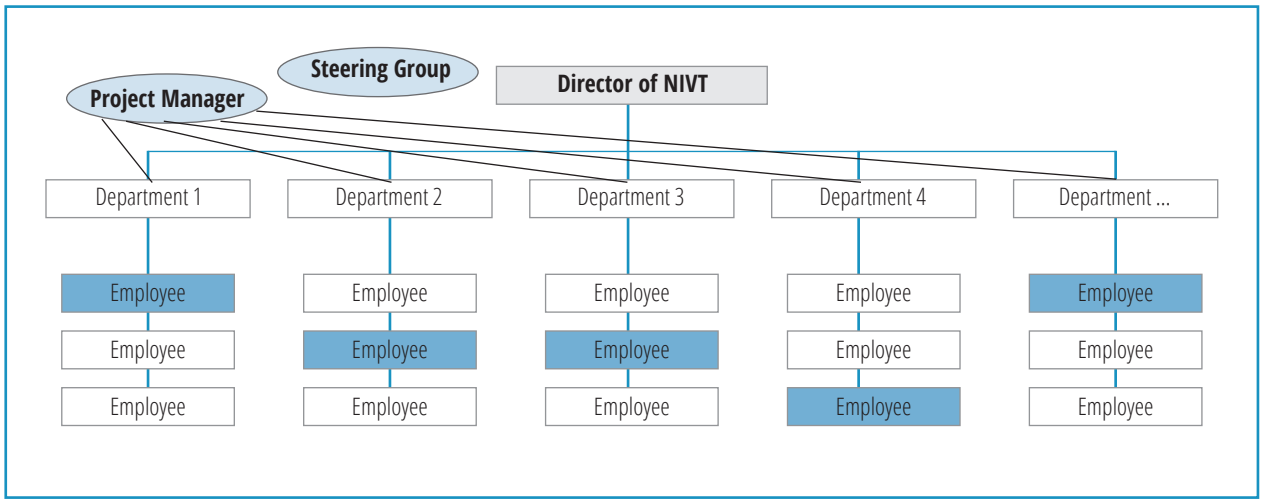
The formation of an external project team was also planned. That remains to be done in the future. The employees who have been assigned along with the Project Manager form a permanent project team which has overall responsibility for generation of the reports. The project was conceived in conjunction with NIVT. The Project Manager, Steering Group and project teams are shown at the left in Fig. 3, with their specific tasks and functions shown at the right.

Figure 3: Project structure for the development of the annual Vietnamese TVET reports at NIVT



Source: Own data

Figure 4: Integration of the TVET reporting project into the NIVT organisational structure



Source: Own data

As shown in the figure, the project is primarily based at NIVT. With continuing support from BIBB, the integrated expert at NIVT and GIZ, perceptible results were achieved in setting up the internal groups at NIVT during the pilot phase. The work groups have been working on a continual basis on generation of the reports since 2011, and the Project Manager and Steering Group coordinate project team activities on an ongoing basis. Figure 4 shows how the project has been embedded into the organisational structure at NIVT.

Assignment of project team members to the internal work groups was based on the operational responsibilities of the various departments and their expertise profile. For example, the TVET Policy Research Department took responsibility for the chapter on TVET legislation, and the Labour Market Research and Labour Market Trend Forecasting Department wrote the chapter on labour market trends and employment. Building on the results attained during initial formation of the work groups, up-skilling of work group members, in particular young researchers who are newly assigned to the work groups, will take place on a systematic basis within the context of the tri-lateral partnership.

In contrast to the results achieved during formation of the internal work groups at NIVT, no external project team working on a continuous basis has been put in place. Little progress has been made so far on the establishment of formalised data exchange pathways and alignment of indicators used in the TVET reports with definition systems used by other data collection entities to ensure data comparability. As a result, the indicators and metrics in the 2011 and 2012 TVET Reports are only marginally in sync with indicators used by other data collection entities. The formation of an external project team consisting of members from other GDVT departments (e.g. the vocational school trainer and vocational education admin staff department, the planning and finance department, the vocational training quality accreditation department) and other relevant research and data collection entities (e.g. GSO, Institute of Labour Science and Social Affairs (ILSSA)/MoLISA, MoET research institutes, etc.) is necessary to achieve synchronisation of indicator definitions and data collection methodologies and for data transfer streamlining, etc. This remains a major challenge, and it should be treated as a priority.

Recommendations for NIVT

- Continuity of membership in the project groups should be maintained. Personnel fluctuation should be kept to a minimum.
- Development work should continue on strategic and operational planning to ensure the reliability and quality of the results. This applies in particular to time and risk management and quality assurance.
- Up-skilling: skill development should continue for the researchers involved.
- Collaboration with other operational departments at GDVT and with research and data collection entities (e.g. GSO, ILSSA/MoLISA, MoET research institutes, etc.) should be intensified. An external project team consisting of members from the institutes and operating departments mentioned above should be set up to improve data access and coordinated indicator definition. The Steering Group should have responsibility for coordination of the external project team. The Steering Group should define a strategy for encouraging greater involvement by other stakeholders.

2: Project schedule

The project schedule was drawn up in line with standard project management practice (see Kuster et al.) as follows:

1. Preliminary planning: definition of outcomes, interim results and work packages
2. Activities and project schedule: specification of the work packages and interim results, allocation of responsibilities and completion dates.

With the advice of the integrated expert and GIZ, NIVT drew up a preliminary project schedule to give structure to the overall report generation process (see Figure 5). On this basis, the Project Manager allocated specific tasks to the individual project team members.

Defining the plan for the various activities during the year was relatively straightforward. On-time task completion turned out to be a far bigger challenge. Consequently, the following aspects of project management have been highlighted as recommendations.

Figure 5: Project schedule for generation of the 2011 Vietnamese TVET Report

No.	Activity	Responsible persons	Responsible organisation	Cooperating organisation	Timeline
					Jan: W1 W2 W3 W4 W5 · Feb: W1 W2 W3 W4 · March: W1 W2 W3 W4 · April: W1 W2 W3 W4 · May: W1 W2 W3 W4 W5 · June: W1 W2 W3 W4 · July: W1 W2 W3 W4 · August: W1 W2 W3 W4 W5 · September: W1 W2 W3 W4 · Oct: W1 W2
1	Project proposal submitted to GDVT and approved by GDVT		NIVT	GDVT	
2	Agreement on working plan NIVT – GIZ, discussion about report structure		NIVT	GIZ	
3	Work out and agree on structure of the TVET report 2011 (information needs, guiding questions, topics)		NIVT	GIZ, BIBB	
4	Indicator development for writing the report (⇨ Internal workshops on indicator development: How to develop indicators of the TVET according to the information needs and guiding questions)		NIVT	GDVT	WS (Feb W3), WS (March W3)
5	Workshop on agreement on identified information needs, guiding questions, topics and indicators		NIVT	GDVT, BIBB, GIZ, GSO, ILSSA	WS (April W2)
6	Final structrue of the TVET report is approved by GDVT leaders		GDVT		
7	Aquisition of data, report writing		NIVT	GDVT	
8	Frist draft of TVET report is available		NIVT		
9	Workshop for collecting feedback for draft report		NIVT	GDVT, BIBB, GIZ, GSO, ILSSA	WS (August W1)
10	Improve and finalise the report		NIVT	GDVT	
11	Approval of the TVET report by GDVT		GDVT	NIVT	
12	Translation of the TVET report in English (including editing)		NIVT	GIZ	
13	Printing out (color printing)		NIVT	GIZ	
14	Launching the report in the Regional TVET Conference		NIVT	GIZ, BIBB	

Workshops
Products/Approvals are ready
Implementation Time Frame

Source: Own data

Recommendations for NIVT

- Data acquisition should be given high priority to ensure compliance with the project schedule.
- The stakeholders should be involved in data acquisition.
- A specific deadline for completion of the reports should be officially agreed.
- The process leading from data analysis and formatting to publication should be kept as short as possible so that current data are available for vocational education and training policy decision-making and officials can respond proactively to foreseeable developments.
- The basic approach should be based on the (highly important) precept that current, relevant data must be available to effectively manage the vocational education and training system.
- Specific deadlines must be set for the receipt of secondary data. Data consolidation and formatting should not take more than 1 -2 months. A draft version of the report should be available 2 months after receipt of the data, and the final version should be available 3 months after receipt of the data.
- The researchers at NIVT who are involved should be given sufficient time off from other duties to write the TVET report.
- The Project Manager should continually track progress and closely manage the project so that timely corrective action can be taken, or alternative strategies can be developed, to ensure completion if difficulties arise.
- Quality enhancement of the indicators and the report should be given adequate consideration in the annual plan (see Fig. 5).

3: Staff development and teamwork

As discussed above, the TVET reports cover such a broad spectrum that the expertise of researchers in many different departments at NIVT is needed to generate them. Constructive, results-orientated teamwork is essential to achieve the desired outcomes. This makes it essential that

- achievement of the overall project goals does not conflict with the personal career goals of the staff members involved (see Kuster et al. 2011, p. 190) and
- communications between all members of the project team are objective and goal-orientated (ibid.). This applies to work-related information sharing, alignment of individual interests with the overall project goals and the development of common problem resolution strategies, in particular for the indicator development process (see Paragraph 3.2).

The Project Manager at NIVT is responsible for ensuring that this environment exists. The person in the leadership position must be able to reconcile the problem-orientated, cross-functional, highly flexible project structure, which is largely based on internal and external teamwork, with the relatively rigid line organisation structure at NIVT and other GDVT operating units. The Project Manager must be able to forge the project team into an effective working group, which is willing to learn, by

- making binding agreements (this applies to the definition of subgoals and clarification of roles and responsibilities)
- ensuring that information sharing, communications and coordination are sufficiently transparent
- making clear decisions in problem situations and communicating the decisions to the project team in a transparent manner
- managing and supporting the staff development process (ibid. p. 190ff).

Recommendations for NIVT

- Particularly during the indicator development process and in formulating the reports, all of the groups involved in reporting must work closely together.
- More work needs to be done to enhance transparent, ongoing communications between the different workgroups, the operating departments at GDVT and other data collection entities.
- Staff development should remain a priority (see Paragraph 2.2).

4: Tools & Instruments/Knowledge Management

To ensure timely data processing and transparent, constructive communications in and between the work groups, each work group should have a database with transparent access to store its own data. Transparent in this context means that the work groups know where the data are stored and can access the data as needed, and the responsibility for database administration and maintenance has been allocated. To avoid creating obstacles, standard, user-friendly software should be used. Because the underlying data for Vietnamese TVET reporting is primarily quantitative, Microsoft Excel is a suitable choice, and *IBM SPSS Statistics* or *STATA*® software can be used for detailed statistical analysis.

Each department should create well-structured data templates for their area of responsibility. Codebooks should be integrated into these templates, so that coding can be aligned correctly with the data at a later date without the possibility of error. Codebooks are also needed so that new team members or members of other project groups

can quickly and correctly interpret the data templates. It would be wise to use existing templates for company surveys. The templates were developed together with RWI and NIVT for the GDVT/GIZ *Programme Reform of TVET in Viet Nam*. They were piloted on that programme in collaboration with vocational education and training institutions and were later used for the Asian Development Bank (ADB) "*Skills Development*" project. User handbooks should also be written to facilitate fast, accurate use of the databases.

Recommendations for NIVT

- All groups working on reporting should develop and continually maintain databases with transparent access to their specific data.
- Standard, user-friendly software should be used for these databases (e.g. Microsoft Excel).
- Codebooks should be generated to make the data easier to understand.
- New team members should receive systematic familiarisation (e.g. with the aid of user handbooks and codebooks).

2.2 Qualification requirements

The researchers need specific skills and qualifications to generate the TVET reports. They should meet the following skills profile:

- In-depth knowledge and experience with research methodologies: in particular in-depth knowledge and experience with indicator development for the analysis, formatting and systematisation of (primarily statistical) data and derivation of tenable conclusions
- Experience with the software being used
- Layout experience
- Experience in writing texts
- Experience in project management techniques
- English language skills which enable the researchers to conduct research in the international environment and ensure that the indicators employed are compatible with international usage
- In-depth knowledge and experience in the specific work context.

The Project Manager should have good knowledge and experience in project management.
Indicator development is a vital aspect of TVET reporting, and it should be given high priority in the skills development process (see indicator development Chapter 3). If skill deficits are identified, training must be provided for the researchers as needed. We recommend that responsibility for layouting be given to one or two members of the research team who already have sufficient knowledge and experience or that layouting be outsourced.

Recommendations for NIVT

- It is essential that the researchers working on preparation of the reports have the skills listed in the qualifications profile.
- If skill deficits are identified, training must be provided for the researchers as needed.

2.3 Stakeholder involvement

Ongoing coordination with the social partners is essential to reach an understanding on what information is needed so that sound vocational education policy decisions can be made.
Coordination should start at an early stage (indicator development) and continue on a sustained basis (indicator review / revision and report quality enhancement). During generation of the TVET reports 2011 and 2012, coordination of the information needs and information sharing between NIVT/GDVT and the other stakeholders were initiated, but the process needs to be intensified and put on a sustained footing. The lack of an external project team up to this point has hindered the coordination process (see p. 17).

Recommendations for NIVT

- Agreement with the social partners on the real information needs is absolutely essential for establishment of the TVET reporting system.
- We recommend the formation of an external project team to intensify coordination and information sharing with other stakeholders in the vocational education system.

3 Requirements for a TVET reporting indicator system

Indicator development is essential for implementation of a sustainable TVET monitoring and reporting system in Viet Nam. Vocational education and training policy decisions must be based on sound data which reflect the current situation, contain the essential information and enable policy makers to react to foreseeable developments and trends. The reliability and information value of the data can only be guaranteed if the findings are based on indicators which are clearly defined and comparable within the international framework and support the management process. The indicator architecture is thus the nucleus of TVET reporting.

The ability to define indicators based on actual information needs and specific objective requirements which extend beyond one particular area of responsibility is a cross-functional skill needed by the researchers who are involved in preparation of the reports. Skill development at NIVT was a prime aspect of the advisory services provided. This guideline will help reinforce and further develop these skills.

The general principles of indicator development are presented in Paragraph 3.1 without reference to any specific context. Examples taken from the German VET Data Report, the Vietnamese TVET report 2012 and a study carried out by GDVT and GIZ (see "GDVT/GIZ" 2014) are cited to illustrate what a "good" indicator is, what the functions of indicators are and what types of indicators exist. Examples are mostly taken from the VET Data Report, which reflects the German context, in order to enhance the recognition effect, because the examples cited where used during the skills development activities.. German examples also reveal the dependency of indicators on the context, highlighting the need for Viet Nam to adapt the indicators to its own contextual framework.

The differences between the different types of scales are also explained as well as the various levels of measurement for the indicators. Finally, indicator data collection and analysis together with the quality criteria are explained. Paragraph 3.2 goes on to outline the steps involved in indicator development. The comparability of indicators is discussed in Paragraph 3.3, and in Paragraph 3.4 we take a look at quality and effectiveness models for vocational education.

3.1 Basic introduction to indicator development

The term *indictor* comes from the Latin word *indicare* which means to point or show. The function of an indicator is to show the state or level of something, which is not otherwise immediately obvious. For example the *arithmetical progression rate* in the German vocational education monitoring system (see Ulrich 2012, p. 72ff.) refers to the annual proportion of students who have graduated from general (secondary) education institutions and have started dual track vocational education. This indicator provides an insight into the *education streams* in Germany and makes it possible to assess certain aspects of the current situation. The proportion of students graduating from general education institutions who start dual track vocational education can be compared with the proportion of students graduating from secondary education institutions who enter university. Decisions which set the direction of educational policy can be derived from these comparisons. A "good" indicator delivers comparable results which make it possible to draw accurate conclusions about complex issues (see Meyer/Thomas 2012, p. 15). "Good" also implies adaptation to the country-specific context.

The function of indicators

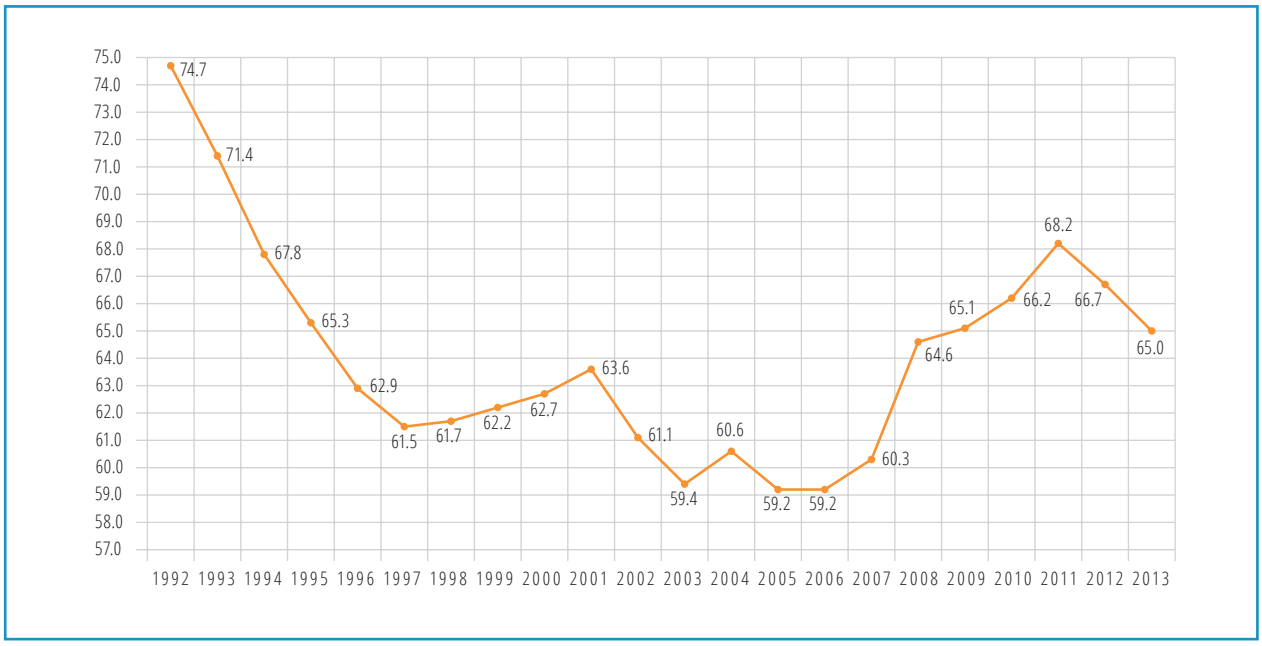
Indicators are comparison tools. They provide a basis for comparison showing similarities or differences between items under investigation (e.g. the employment status of vocational education graduates) on a common scale with at least two different values. The results are values on a (pre-defined) scale. Observations about the items under investigation can be classified based on these comparisons. It is even possible to analyse phenomena which are not directly observable (see Meyer 2004, p. 12f.).

The following comparisons are pivotal in vocational education and training reporting (ibid. p. 9ff).

1. The comparison of actual values with ex-ante / previously defined target values (goal achievement). In the German VET Data Report for example, the current status is compared with a target *number of teaching staff at vocational education and training institutions* at a defined point in time in a particular type of school (or occupation, gender, etc.). The goal achievement perspective is highly important, because based on monitoring results the TVET reports are expected to provide information about achievement of the goals which have been defined in the Viet Namese TVET development strategy 2011-2020 (see Socialist Republic of Viet Nam 2012).
2. The current status is also compared with **previous data (trend analysis).** In the German VET Data Report for example, the *number of teaching staff at vocational education and training institutions* in a particular type of school in 2013 is compared with the number for 2014 in order to derive a figure for the increase or decrease.

A simple example of trend analysis and trend comparison for the *arithmetical progression rate* in German vocational education is shown in Figures 6 and 7.

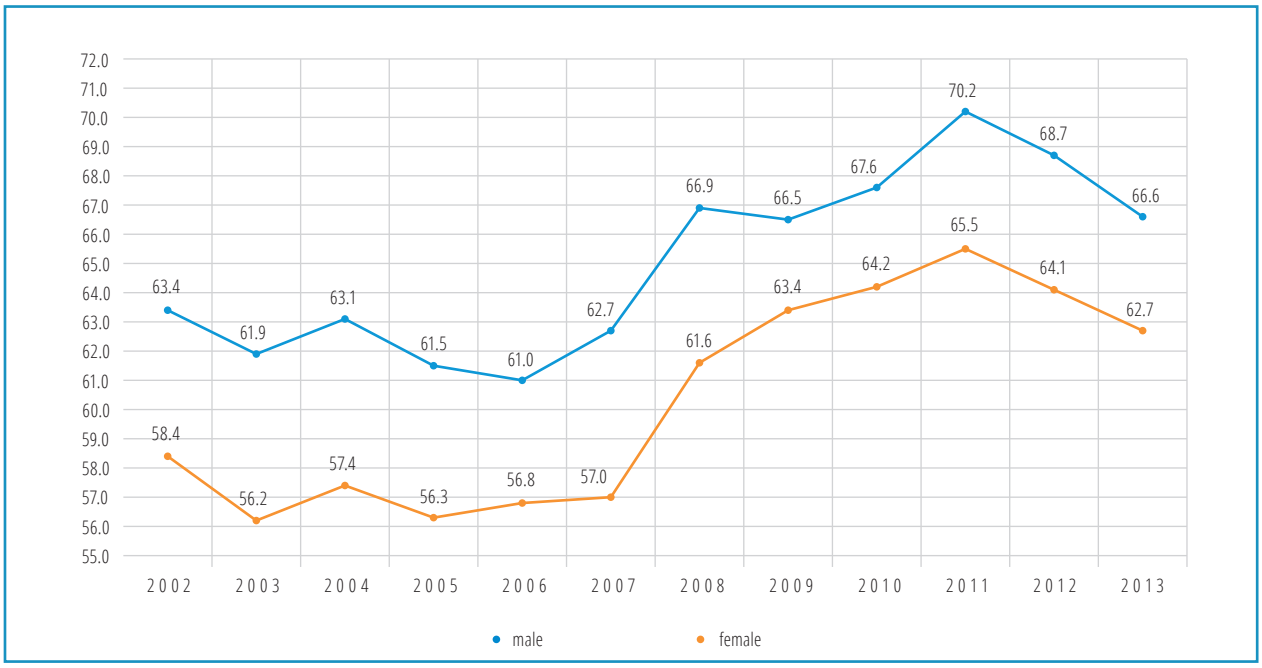
Figure 6: Nationwide progression rate in dual track vocational education and training in Germany since 1992 in %



Source: BIBB Datenreport 2014, p. 28

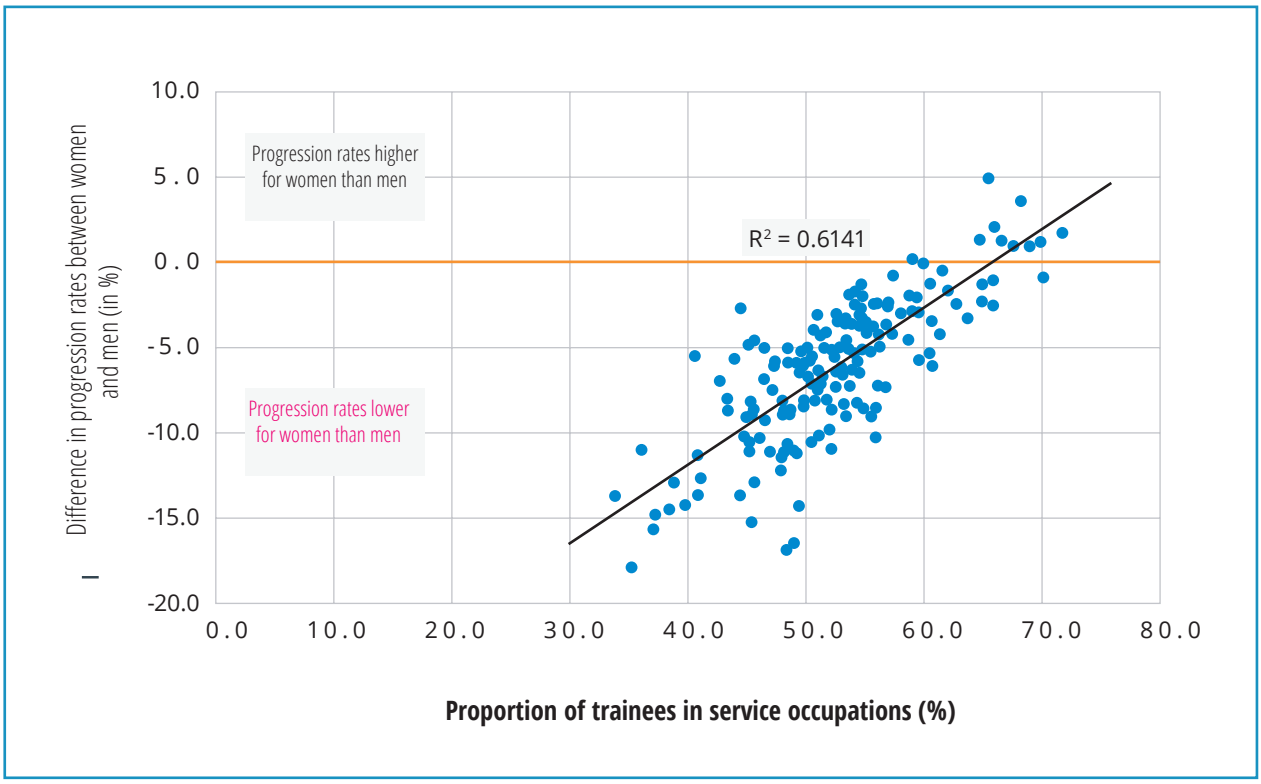
Fig. 6 shows the proportion of persons recorded as interested in vocational education and training, who had started dual track vocational education by the September 30th cut-off date between 1992 and 2013. The proportion of persons who entered dual track vocational education and training declined quite steeply from a very high 74.7% in 1992 to 61.5% in 1997 and then increased again to 68.2% by 2011.

Figure 7: Nationwide progression rate in dual track vocational education and training in Germany since 1992 – gender breakdown in %



Source: BIBB Datenreport 2014, p. 28

Figure 8: Deviations in progression rate by gender resulting from different vocational education and training ratios in service occupations (n = 176 regions)



Source: BIBB VET Datenreport 2013, p. 28

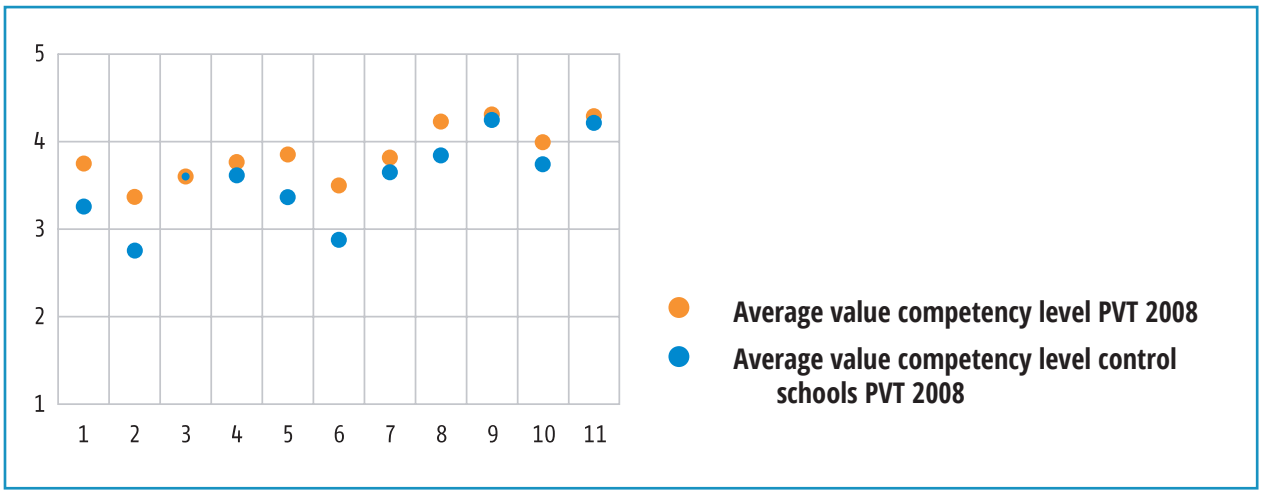
Using various criteria, different types of information can be extracted from these indicators. In Germany for example, progression rate trends have been tracked by *gender* since 2002 (see Fig. 7). This differentiated view shows that the proportion of young women who entered dual track vocational education is significantly lower compared to young men. This can be explained by the fact that a higher percentage of young women choose full-time school-based training in service occupations rather than dual track vocational education and training (ibid. p. 29).

3. Actual figures are compared with defined cut-off score (threshold analysis), e.g. a comparison of the actual figure with a (defined) minimum number of vocational education school teachers in a particular type of school or with a critical number of apprenticeship applicants so that a shortage of skilled labour can be avoided.
4. The actual figures can also be compared with findings from other reporting systems (benchmarking) e.g. comparison with actual vocational education school teacher qualification levels in different countries or regions. Relationships between multiple criteria can be analysed, e.g. in the German VET Data Report the relationship between choice of occupation and gender based on the arithmetic progression rate discussed above (see Fig. 8).

Fig. 8 shows that different occupational preferences (more young women than young men choose training in full-time school-based service sector occupations) largely explain the different apprenticeship placement rates for young women and men.

Control group comparisons are another example. *Competency levels* or the *employment status* of vocational education and training graduates from different institutions in different regions or with different ownership statusare compared. In company surveys for the GDVT/GIZ *Reform Programme of TVET in Viet Nam, the competency levels of graduates from TVET institues which received 2008 Vocational Training Programme (PTV 2008)* funding was compared with graduate competency levels for a control group of TVET institutes which did not receive such funding. *Theoretical occupational knowledge* was used as the basis of comparison. Fig. 9 shows that the competency levels of graduates from TVET institutes which received PVT 2008 funding were slightly above the competency levels of the control TVET institutes.

Fig. 9: Control group comparison of funded and non-funded TVET institutes in Viet Nam



Source: GDVT/GIZ 2014

Simple vs. complex indicators

Indicators can be simple metrics. However, an indicator can be a composite of multiple individual indicators.

Simple indicators: Common indicators used for vocational education monitoring in Germany include metrics such as the *number of graduates from specific vocational education and training courses*, the *number of students first entering vocational education* and training *(beginners)* and the *number of teachers and trainers for these vocational education and training courses*.

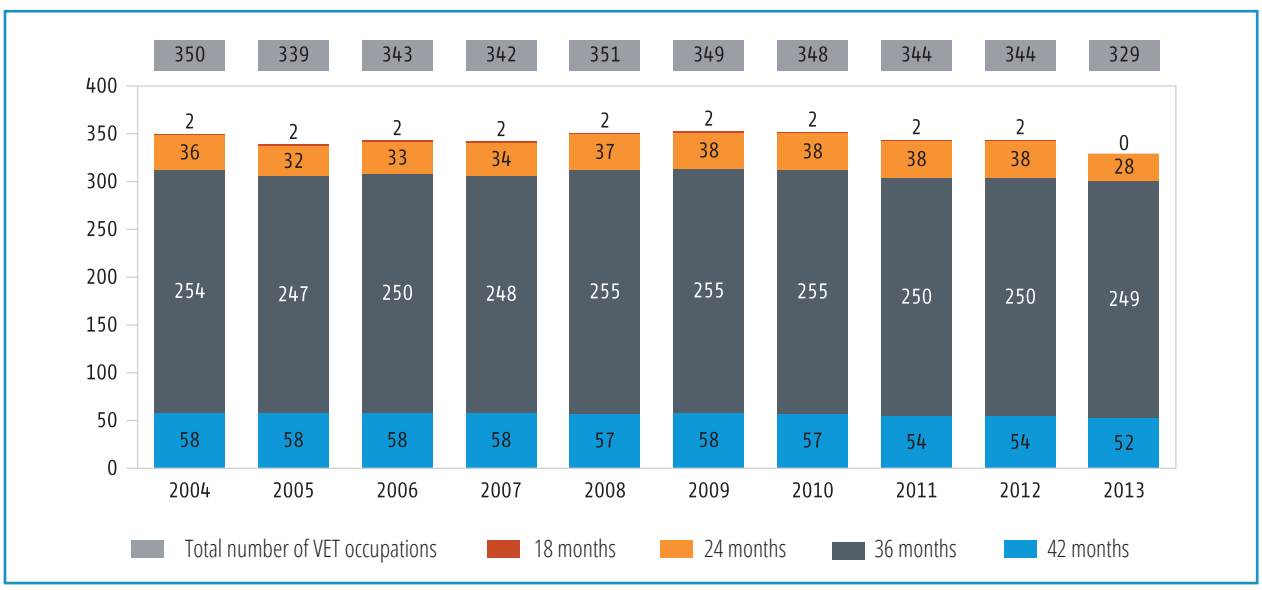
A single indicator can be classified as an indicator (in contrast to a simple number used on a daily basis) if

- the number of vocational education institutes observed, the number of vocational education courses or similar is defined as the reference base for the indicator
- a cut-off date is assigned to the indicator
- the data sources are identified and
- the key information content and the extent of validity are defined.

As an example, the number of vocational education and training occupations which are officially recognised in Germany based on the Vocational Education and Training Act or the Trade and Crafts Code are shown in Fig. 10 broken down by length of training.

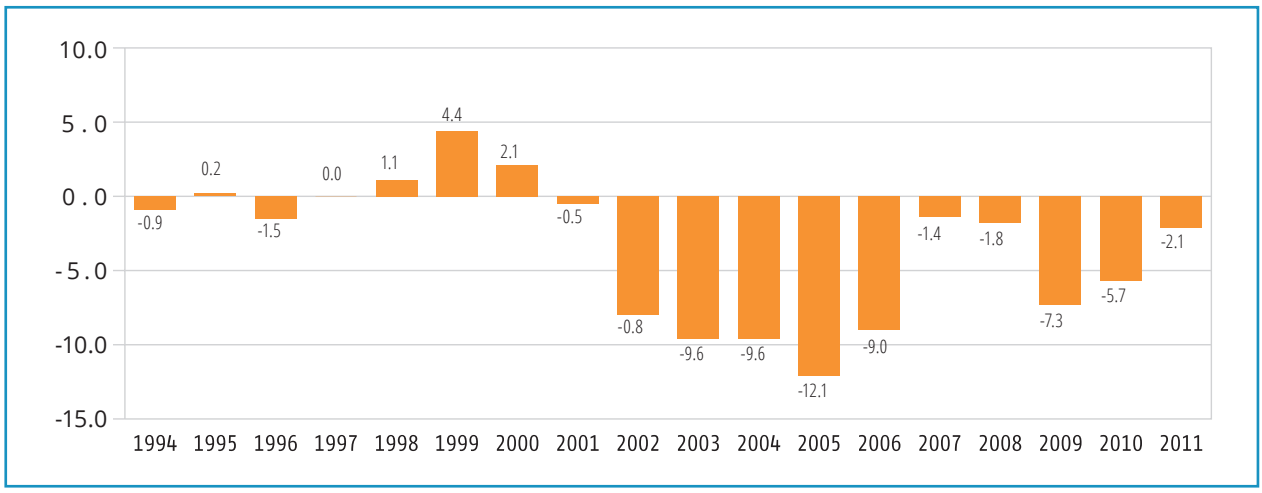
Fig. 10 shows that indicators need not be complex to visualise different ratios or relationships. An indicator can simply be the count for a precisely defined observation, in this case the number of officially recognised vocational education and training occupations based on data collected at a specific cut-off date.

Figure 10: Number of VET occupations - breakdown by length of training (2004 - 2013)



Source: BIBB Datenreport 2014, p. 99

Figure 11: Dual vocational education and training participation rate 1994 - 2011: rate of change in %



Source: BIBB "Vocational Trainee Database", data extracted from vocational education statistics compiled by state and national statistical offices (cut-off date December 31st), reporting years 1993 – 2011, Federal Statistical Office population statistics, reporting years 1993 - 2011. BIBB figures.

Complex indicators: Complex indicators are also known as indices (singular: index). A complex indicator or index can be a ratio which shows the relationship between the item of interest and a base value (see Bortz/Döring 2006, p. 729). Another example from German vocational education and training monitoring is the *dual vocational education and training participation rate*. In this instance, the *number of trainees who sign new apprenticeship agreements* (broken down by age) as the numerator is viewed in relation to *the size of the resident population* (broken down by age) as the denominator (see BIBB 2012, p. 141ff.). Fig. 11 depicts the change in the *dual vocational education and training participation rate* in Germany between 1992 and 2011.

If a complex indicator is used as in Fig. 11, it should be clearly defined in the report, as is the case in the German Datenreport (see Fig. 12). The essential information content as well as the values and formula used to calculate the indicator are shown. If the indicators are revised during the quality improvement process, the changes must be clearly explained in a similarly transparent manner. For example in 2012, a modification was made to the definition of the *dual vocational education and training participation rate* in

Figure 12: Illustration of the definition of the dual vocational education and training participation rate in the German VET report

$$= \sum_{i=16}^{24} \frac{\text{Vocational education students with new apprenticeship agreement;}}{\text{Resident population;}} \times 100$$

i = age*

* Vocational education students with new apprenticeship agreement "16 years of age and younger" are included in the bottom age group; students "24 years of age and older" are included in the top age group.

Replaced: Vocational education take-up rate

Prior to revision of the vocational education and training statistics, the only data which could be extracted from the vocational education and training statistics to quantify the vocational education and training participation rate were the number of new apprenticeship agreements and number of students in vocational training (see BIBB Data Report 2009, Section A5.7). The introduction of the training entrant rate provided a basis for more accurate measurement of students entering vocational education and training for the first time without multiple counting. The vocational education and training praticipation rate is now primarily a useful measure to compare long-term trends. The vocational education and training participation rate is the computed proportion of a synthetic birth cohort in the resident population which have signed a new apprenticeship agreement in the dual track system. The number of young people with a new apprenticeship agreement is compared to the equivalent age group in the resident population (Uhly/Gericke 2010; for a comparison of education and training indicators see Gericke/Uhly 2012).

Source: BIBB Datenreport 2013, p. 162

German vocational education and training reporting (see Fig. 11 and 12). As a result, Fig. 11 only shows the time series for the period 1994 – 2011, and the series is not continued. Continuation of the time series beyond 2011 using the new definition of the *dual vocational education and training participation rate* would have been improper. The definition of the participation rate used for data collection up until 2011 is also included (see formula in Fig. 12). The newly defined rate was shown in a similar manner.

An index can also be a composite number made up of several single indicators, representing a complex value. The components of the complex value can be assigned the same weighting or different weightings (see Bortz/Döring 2006, p. 729). This type of index can be computed, for example, by generating composite statistics to form larger competency subsets based on individual competencies in order to evaluate specific competencies of vocational trainees or graduates following a precisely tailored validity check (see for example Rauner 2010, p. 26; GDVT/GIZ 2014).

Different scales and indicators

The ability to associate an observation with a specific value on a scale is absolutely essential for the definition of an indicator (Meyer 2004, p. 13). Comparisons can be made with the indicators in order to identify commonalities or differences between real attributes using a common basis for comparison (scale) with at least two different values (on the scale). Comparisons can only be based on values which are associated with the same type of scale, and complex indicators can only be composed of single indicators which share the same type of scale.

A brief discourse on scales

To shed more light on comparisons, the following sections present the different types of scales which can be used for indicator definition (see Bortz/Döring 2006, p. 741; Meyer 2007, p. 206ff).

Nominal scale: Nominal scales are the most basic type of scale, and they are used to classify qualitative attributes. *Gender, religious affiliation, place of birth* and *occupation* are typical examples. Nominal scales are used to analyse different attributes. This can be done using simple quantitative methodologies (frequency distributions) or qualitative techniques (e.g. heuristic analysis, criteria-based type classification in qualitative analysis; see Mayring 2010). More advanced quantitative analysis such as computation of the median or arithmetic mean is not meaningful with this type of scale. The only available location parameter is the *mode* or *modal value*.

Ordinal scale: In contrast to nominal scales, ordinal scales can be used to indicate rank order (better/worse, bigger/smaller, etc.). This type of scale is frequently used to collect information about attitudes or satisfaction levels in different segments of the population. The five-level *Likert scale* is often used. Typical examples in vocational education are *school grades* (scale 1 – 6, A - U or similar), the *relevance of basic and advanced training* and *satisfaction with teaching and learning materials* as rated by the target groups (see GDVT/GIZ *Reform Programme of TVET in Viet Nam* tracer studies, Horn 2014a, p. 28; RWI 2014, p. 22). In addition to frequency analysis, location parameters can be determined through statistical analysis of the mode and median. Computation of the arithmetic mean is not allowed with this type of scale.

Interval scale (cardinal scale): Interval or cardinal scales[1] are used for quantitative attributes. Most statistical analysis techniques and comparisons are allowed including frequency distributions, rankings and the arithmetic mean (average). *Age* and *amount of income* are typical examples of interval scales. However, not all numeric scales are automatically interval scales. Telephone numbers, for example, are numeric but they are nevertheless nominal attributes. It makes no sense to compute the mean from a list of telephone numbers.

Indicators and data collection and analysis

Indicators are associated with different types of scales which imply various data collection and analysis techniques. Qualitative and quantitative methods are the two basic choices, and a combination of the two is recommended (triangulation). When analysing secondary data, it is important to consider which type of data are suitable for which analysis method. If organisations design and carry out surveys on their own, the most suitable methods must be identified during the conceptual design phase. This is an important consideration for indicator definition (see Paragraph 3.2), as thought must be given to exactly how data will be collected and analysed for each indicator.

Indicator quality criteria

Indicator quality assessment can be based on many different criteria. The five SMART[2]–criteria are probably used most often:

***S**pecific:* indicators have to provide accurate information on a specific set of observations and invariably deliver reliable results even as conditions change and also when data collection takes place on a recurring basis. For example, the *vocational education and training participation rate* must be formulated in such a way that the data accurately reflect the specific observations (the *vocational education and training participation rate*) and also deliver reliable results when data are collected again. The essential data content (the link between the indicator and the item under observation), the value (count), the reference base (denominator), the formula used for computation, the data sources and the cut-off date were precisely defined for this indicator (see BIBB 2012, p. 88ff.; BIBB 2014b, p. 137). It is important to realise

[1] This also includes ratio scales which have a fixed zero point.

[2] Other terms are also associated with the letters of the acronym, e.g. Specific, Measurable, Accepted, Realistic, Timely.

that the indicator is specific only if these aspects have been defined.

***M**easurable*: it must be possible to acquire data with sufficient accuracy for the indicator. Staying with the *vocational education take-up rate* example, it is only a useful measurement in Viet Nam if it is defined in such a way that data collection is practical. Apprenticeship agreements are signed in Germany, but no similar agreements exist in Viet Nam. As a result, the measurement used, namely the *number of trainees who have signed a new apprenticeship agreement (*see BIBB 2012, p. 88), needs to be redefined.

***A**chievable*: the amount of effort needed to produce findings of sufficient accuracy must be feasible and reasonable in relation to the expected benefit. Taking the *vocational education and training participation rate*as an example, the indicator would have to be formulated in such a way that existing secondary data from other data collection entities could be adapted to suit the purpose. If data which provides specific information about the paricipation rate is not available, other data which might contain indirect information would have to be adapted using workable correspondence rules. The practicability of primary data collection specifically for data reporting purposes should be carefully weighed, especially in view of the costs and time involved.

***R**elevant*: indicators must deliver results which provide useful, substantive information and meet the needs of the various stakeholders. The *vocational education and training participation rate*example is a good case in point. The excess number of university graduates and the shortage of vocational education graduates with skills which meet the actual needs of the business community in specific occupations is currently a problem in Viet Nam (see http://english.Viet Namnet.vn/fms/education/ 113836/graduates-battle-tough-job-market.html, version: 11/01/2015). Data on the *vocational education and training participation rate*adapted to the Vietnamese context and collected on an ongoing basis could be used for systematic comparison of the vocational and university education take-up rates and for ongoing trend tracking. This would appear to be highly relevant given the current problems.

***T**imebound*: an indicator must have a specific cut-off date and provide the results on time (see e.g. ibid. p. 17; Kuster et al. 2011). A cut-off date has been assigned to all of the indicators used in German vocational education reporting. See Dionisius/Lissek/Schier 2012; BIBB 2014b).

As an example, the five SMART criteria are applied below on a weighted basis with reference to the 2011 and 2012 Vietnamese TVET reports. The example highlights the key requirements which the indicator must meet and the essential aspects which must be considered during indicator definition. Table 1 contains selected examples of indicators and metrics which were included in the 2011 and 2012 TVET reports.

Table 1: Topics and indicators/metrics in the 2011 and 2012 Vietnamese TVET reports

Item	Indicators/metrics
TVET legislation	- current overview of legislative developments in the Vietnamese TVET system - number of new laws and regulations
TVET institutes	- number of TVET institutes by school type
Teaching staff	- number and qualification level of TVET teachers/instructors by school type - number and qualification level of school management by school type
Students first entering TVET education; graduates	- number of TVET students by school type - number of graduates by school type - employment situation of graduates from *GDVT/GIZ Programme Reform of TVET in Viet Nam* funded TVET institutes
Infrastructure, facilities and equipment	- number and content of regulations on TVET facilities and equipment - number by equipment/facility type and school type
National occupational skills standards	- summary of current standard development trends - number of new *national occupational skills standards*
Financial resources/ investment in the Vietnamese TVET system	- annual investment in the TVET system in Vietnamese Dong (broken down by state, private and foreign investment)

In terms of *relevance*, it was important to assure that the indicators contained in the report correspond to the management information needs of the TVET sector, meaning that the indicators had to provide useful management information and be aligned with the TVET development strategy 2011 - 2020 (see Socialist Republic of Viet Nam 2012).

The criteria which were selected may not be satisfactory for management purposes because they represent inputs. It is questionable whether results or demand orientated management of the TVET sector in Viet Nam can realistically be based on these indicators (see Paragraph 3.4).

The next question is whether the indicator definitions are *specific*. Taking the *teaching staff qualification level* indicator as an example, exactly what the indicator is based on (i.e. the existing qualification standards) and how substantial that basis is remains to be clarified. There is also a question as to whether the qualification standards will continue to stand up to scrutiny in the future and consequently whether it is meaningful to use the indicator in its present form to track trends over a period of years.

Measurable and *achievable* are next on the list, and it is easy to judge whether the example indicators meet these criteria. All of the indicators/metrics shown in the table are based on existing data sources, and it will be possible to process and present the data throughout the envisaged time period. These criteria will play a much more important role in the future indicator development process. A review must be undertaken to identify potential data sources for new indicator development, and the time and human resources needed to collect, analyse and publish the results must be assessed.

The time element (timebound) must also be reviewed. If trend analysis is envisioned, all of the data must have the same cut-off date. Trend comparisons are valid only if this is the case.

Using the examples above as a guideline, evaluation of the indicators used based on the SMART criteria is recommended in the future as well. Use of the structuring aid shown in Table 2 for indicator definition (see p. 41) is also recommended.

Indicator summary

- Indicators represent observations which are impossible or very difficult to measure directly.
- Indicators provide a basis for comparisons and assessments. Observations can be allocated to predefined categories and compared using a common basis for comparison (scale) with at least two values on the scale.
- Indicators can be simple or complex. They differ in the type of scale used.
- The quality of an indicator is determined largely by how precisely it is defined, how measurable, practicable and useful it is and how well it is accepted.

3.2 Steps in indicator development

Indicator development does not normally involve a linear sequence of cumulative steps. Instead, it is an iterative development process with feedback loops between sequential steps. Indicator development can be structured as a recursive learning process in which the indicators can be updated to meet evolving needs (see Horn 2011, p. 148).

Indicators should also provide a basis for trend tracking. As a result, maximum consistency is a vital consideration during indicator definition. If the revision of an indicator definition results in changes to the reference base, timeframe or cut-off date, etc., then time-series comparisons are no longer meaningful. On the other hand, indicator relevance and quality enhancement should have top priority, making revision inevitable. Particularly as the nature of the problems and the priorities in the TVET sector evolve over time, the need for indicator development will remain. There is no other way of ensuring that the indicator system provides meaningful management information. That being the case, every indicator system must be seen as a compromise between the *consistency* of the indicators used for trend analysis and *revisions* needed to improve the quality and increase the relevance as the nature of the problems evolves. Fig. 13 shows the six key steps in the indicator development cycle.

1) Identification of information needs and formulation of central management issues:

The first (and extremely important) step in indicator development for the TVET reporting system is identification of the sector-relevant information needs in consultation with the major stakeholders to ensure the relevance of the indicator system. Based on the information needs, the core management issues, which largely determine the content structure and priorities of the TVET report, must be identified.

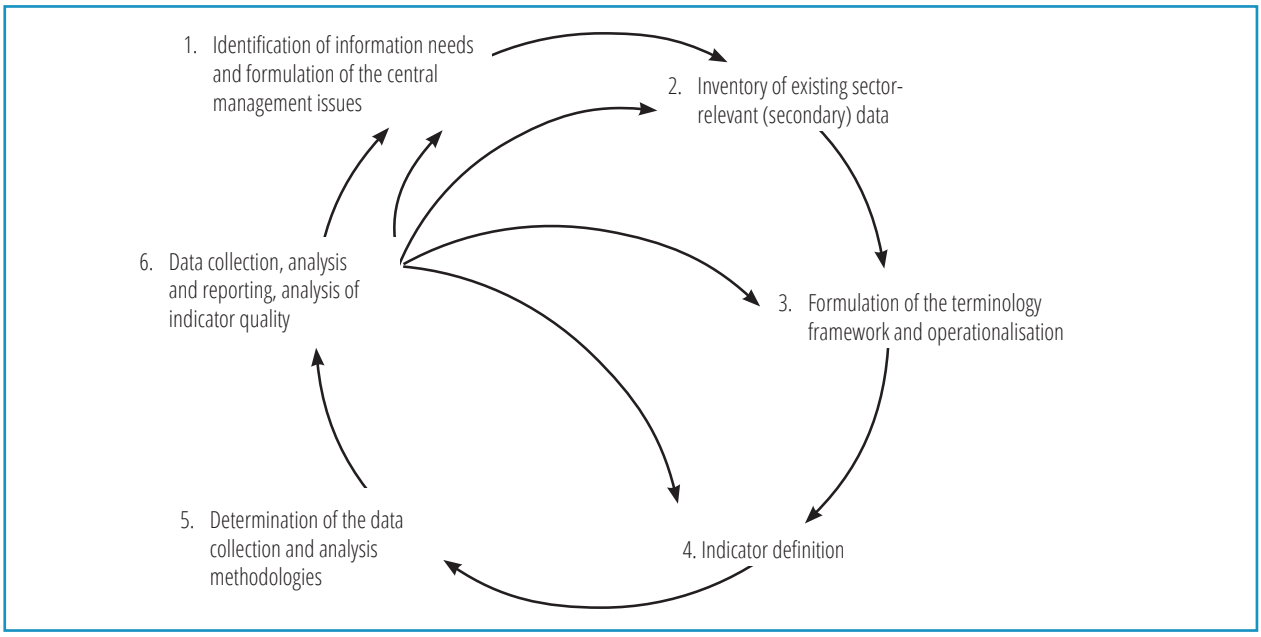
Note: because the nature of the problems (in the sector) and the general framework continually evolve, it is important to check stakeholder information needs at regular intervals. This should be done by the external steering group, and the results should be reflected in the project plan.

2) Inventory of existing sector-relevant (secondary) data:

Following determination of the information needs and formulation of the core issues, the next step is to assess the data environment. All data from sources which might be of use (e.g. statistical offices) must be reviewed.

Note: to minimise the cost of the report generation process, primary data collection should only be undertaken on an exceptional basis, meaning only when no other (useable, reliable) information is available.

Figure 13: Steps in indicator development



Source: see Horn 2012a p. 62ff., de Graca/Peano/Saito 2005, Meyer 2007, p. 201ff.

3) Formulation of the terminology framework and operationalisation:

The term *operationalisation* refers to the creation of a logical relationship between a latent (not directly measurable) variable and a manifest (directly measurable) indicator using a correspondence rule which provides information on the nature of the relationship (see Meyer 2007, p. 202). Operationalisation normally involves three steps:

1. Determination of the phenomenon under observation and the theoretical construct which defines a relationship between the phenomenon and a potential indicator, in other words defining what exactly is to be operationalised
2. Logical derivation of a correspondence rule which defines how the construct will be operationalised
3. Specification of the number of required rule categories, in other words a decision on how accurately the indicator will reflect the phenomenon (see ibid, p. 203).

These three steps normally involve the development of a terminology framework prior to detail design of the indicator. This means that, as is the case with the German VET Data Report, if the intention is to provide information on the *vocational education and training participation rate,* the *graduation rate* or the *employment rate* for graduates, it is first necessary to clarify exactly what is meant by *vocational trainees*, *graduates* and the *employment situation* in the Vietnamese labour market. A vocational education and training graduate could, for example, be formally or informally employed, self-employed, an employer or a working family member (see Hussmanns 2004).

Narrowing down the meaning of the terminology is essential to define exactly what is meant by the phenomenon under observation. The term theoretical construct (Step 1) means that *terminology* is normally integrated into different streams of (vocational instruction) theory development. If the intention is to evaluate the competency of vocational education graduates, it must be very clear what is meant by *competency* and what *competency model* (theoretical construct) is being used before the indicators can be defined and scales assigned. Definition of the terminology framework should be correlated with standard glossaries (particularly for the vocational education sector).

Another important aspect in the development of the terminology framework is correlation with terms and terminology systems used by other data collection entities if their data are used as a secondary source. Standardisation and coherence are highly desirable, because indicators and data which are based on different definitions cannot be used as a basis for comparison.

Note: Clarity of terminology along with coherence and a systematic framework is vital for effective monitoring in the vocational education and training sector. A coherent terminology framework is important not only for TVET monitoring and coordination with the entities which collect reference data, but also for the clear formulation of strategies and goals, as for example in the *Vietnamese Vocational Education Development Strategy 2011-2020* (see Socialist Republic of Viet Nam 2012), as well as for an objective debate on vocational education policy and issues.

4) Indicator definition:

The operationalisation process continues based on the terminology framework. The indicators can be specified once the phenomenon under observation and the theoretical construct needed to access the phenomenon have been defined and the correspondence rule which can be derived from the theoretical construct have been identified. The following need to be clarified:

- how informative the indicator is
- which type of scale is appropriate
- how many values can be placed on the scale (i.e. how accurate will the indicator be)
- what the reference base for the indicator should be
- what the data sources for the indicator are
- what the timeframe is.

To ensure that the indicator definitions are systematic, explicit and transparent, the structuring aid in Table 2 was recommended to NIVT as a basis for definition of all indicators used in TVET reporting in Viet Nam. The structuring aid is based on the content structure used in German vocational education reporting.

Because it is not realistic ad hoc to use this approach to define (at this level of detail) all of the indicators used in the 2012 TVET report, we recommend starting with the indicators which are most relevant to the Viet Namese context and then gradually add all of the other indicators.

Note: Indicator definition should be systematic; the information value, meaning, reference basis and computation formulas as well as the data collection cut-off dates and timeliness of the data should be transparent and systematically worked out, recorded and published.

5) Determination of the data collection and analysis methodologies:

When the indicators are conceptualised, consideration must be given to the data analysis techniques which will be used. If NIVT intends to collect data on its own, it also has to decide exactly what data needs to be requested/collected and how much time and effort will be involved.

Table 2: Structuring aid for definition of indicators

Indicator name	Enter the name/designation of the indicator.
Core information content	State what the name/designation represents, what it describes.
Timeliness	State the time period to which the data refers and whether the data are recent enough to make meaningful judgements about the current status.
Significance for vocational education	Describe how informative and relevant the indicator is for the TVET system in Viet Nam.
Reference base	For ratios (rates), state the value under observation (numerator) and the reference base (denominator).
Computation	For rates and ratios, enter the formula used.
Possible differentiation	List any subcategories (e.g. gender).
Data sources	List the data used and the source (data collection entity).
Cut-off date	Enter the data collection cut-off date (not the date when the data was analysed and not the publication date)
Comments on the quality of the indicator	State the quality/reliability of the data in order to shed light on the informational value or limitations of the indicator and reveal the causes of any potential distortions.
Other/FAQ	Include interpretation notes, questions asked in user forums and references to any other indicators which are used in a different way by other data collection entities.
Main publications	Name the media in which, firstly the indicator definition, and secondly the indicator data analysis results, were published (in particular the TVET report).

Source: Dionisius/Lissek/Schier 2012 - Url: www.bibb.de/veroeffentlichungen/de/publication/show/id/6830 (version: 12/1/2015)

If data are drawn from secondary sources and then consolidated to create complex indicators (composites), the complexity of the quantitative and qualitative analysis techniques and the skills needed by the staff performing data analysis must be considered. If limitations are encountered, advanced training could be provided for the researchers involved in data analysis. Alternatively, it might be possible to simplify the indicators so that data collection and analysis can proceed with minimal loss of informational value.

Note: When the indicators are defined and the data collection and analysis methods are selected, the accuracy and informational value of the results must be weighed against the feasibility of data collection and analysis. A highly accurate and informative indicator, which however makes analysis a difficult challenge, is not a "good" indicator.

6) Data collection, analysis and reporting, analysis of indicator quality:

Data collection, analysis, formatting and reporting and a continuous quality improvement process need to be woven together. Sufficient time must be allowed for this right from the outset. If any problems with the indicators or inconsistencies, logical errors or incoherencies are detected when the reports are generated, this should be conscientiously recorded. Problems noted during data collection, analysis and reporting along with errors detected in the indicator system should be discussed in workshops held on an ongoing basis for the specific purpose of quality improvement and reporting process optimisation. Continued use should be made of international advisory services provided by organisations such as BIBB and GIZ.

Note: Data collection, analysis and reporting should be woven together with ongoing quality improvement and process optimisation during generation of the reports. Continued use should be made of international advisory resources to assist with quality improvement.

Summary of indicator development

- The indicators must be based on formulated information needs and the key issues to be addressed which are derived from those needs. (Who needs what information in the TVET sector?)
- The information needs, key issues and resulting indicators have to be reviewed and updated on an ongoing basis.
- The indicators must be based on defined terminology. The terminology must be aligned with the definition of terms as used in the vocational education sector and by other relevant data collection entities (e.g. government statistical offices).
- It must be possible to make assertions about concrete observations based on indicators which are ***SMART*** formulated. The information value of the indicators must be determined.
- The definitions must be transparent and made accessible to the readership.
- Indicators must be placed on a scale and the values on the scale must be defined.
- Data sources must be defined and the reliability of the sources must be verified.
- The point in time when data is collected along with the data collection intervals and place of collection must be defined.

3.3 Comparability of indicators

Indicators should provide a basis for comparisons between many different items of interest which are impossible or very difficult to measure directly. The four types of comparison which play a key role in TVET reporting were described in Paragraph 3.1: comparison of actual values with defined target values (goal achievement analysis), comparison with previous results (trend analysis), comparison with limits (threshold analysis) and comparison with other reporting systems (benchmarking). *Trend analysis* is discussed in Paragraph 3.3.1, and we took a look at *benchmarking* in Paragraph 3.3.2, since both are highly relevant for the development of TVET reporting in Viet Nam. International and regional comparability based on indicators is addressed in Paragraph 3.3.2.

3.3.1 Trend analysis

Much of the data contained in the TVET Report 2012 is currently being presented in time series format, for example the number of students first entering TVET education (broken down by school type) (see Fig. 14).

As can be seen from Fig. 14, the number of students first entering vocational education declined in 2011 year-on-year but increased again in 2012, although it still remained below the 2010 level.

We recommend that trend analysis be extended to other data contained in the Viet Namese TVET reports, for example teaching staff qualification levels. Trend comparisons are already used in the reports for many other areas of interest (ibid. p. 54ff.). Because improvement in the qualification levels of teaching staff was included in the TVET Development Strategy 2011-2020, all aspects of qualification should be presented in time series format.

Note: Time series analysis (to study trends) is only permissible if the indicators have exactly the same definition and the data are taken from exactly the same sources with the same cut-off dates. If changes have been made to the indicators to improve quality or make adaptations as conditions evolve, a new time series must be started at that point.

3.3.2 International and regional comparability

The process of Vietnamese international and regional integration, particularly in the ASEAN federation, is currently underway. The Viet Namese government wishes to further intensify integration (see World Bank 2014). To support these efforts, the indicators used in Viet Namese TVET reporting should lend themselves to international comparison. This, however, remains a challenge. For example the *qualification level of teaching staff* is included in both pilot TVET reports (see *National Institute of Vocational Training* 2011, p. 34ff; *National Institute of Vocational Training* 2012, p. 54ff). The *qualification levels of teaching staff* with specific reference to *professional knowledge, hands-on skills, language skills, IT expertise and teaching ability* are discussed in the TVET Report 2012. Knowledge and skills were assessed based on the "attainment of the minimum requirements level".

The fact that these qualification standards (professional knowledge, practical skills, language skills, IT expertise and teaching ability) were explained in the reports is very helpful. Different qualification levels which vary by school type were analysed, making it clear whether and to what extent the standard was achieved. However, the fact that the criteria for these levels were not explained and national standards

Figure 14: Number of students first entering TVET education in Viet Nam, by school type

Source: National Institute of Vocational Training 2012, p. 73

were used presents a problem. Judgements about whether teaching staff in Viet Nam have achieved the qualification standards can only be made by Viet Namese analysts but not by international analysts. We recommend that examples of criteria used to assess qualification levels be included. To provide a basis for comparing teaching staff qualifications and skills at the international level, commonly accepted international standards should be applied.

Note: To make the information understandable to an international audience, the indicators must be based on international standards and the reference base and sources must be transparent.

3.4 Vocational education and training quality and effectiveness models

For a number of years, there has been a consensus in the international vocational education research debate that monitoring systems should be directed at the *quality and effectiveness of vocational education and training*. So this is an important factor to consider in the design of the TVET reporting system.

Quality management models and tools are now a much more common feature of the vocational education and training landscape. Also, vocational education QM models are the subject of discussion among the vocational education and evaluation research community. As a result, a variety of different approaches and models now exists (see ibid. BIBB 2010; Ebbinghaus 2009; Horn 2012b). The same is true for *vocational education effectiveness modelling* (see Stockmann/Silvestrini 2013; Döbert 2009; Stockmann 2006). It has not been possible to include an overview of the different approaches in these guidelines. The important point here, however, is that the *quality and the effectiveness of vocational education and training* are two major criteria to consider when the indicators for the TVET reporting system are defined. The quality and effectiveness model should be based on input, process, output and effectiveness indicators. This has been the case in Vietnamese TVET reporting to the extent that, with the support of the integrated expert at NIVT, a draft Vietnamese sector monitoring system in model form was developed for the vocational education management domain (see Fig.1, 1.3.2). Underlying input, process, output and effectiveness indicators should be added to the model during indicator development.

The draft was dovetailed with the *GDVT/GIZ Programme Reform of TVET in Viet Nam* monitoring system (see Horn 2014a). Monitoring of the *employment situation* and *competency levels* of graduates from funded vocational education institutions compared to non-funded institutions is already being performed by the *GDVT/GIZ Programme Reform of TVET in Viet Nam* in conjunction with NIVT. Monitoring of *teaching methodologies* in funded institutions is also ongoing to assess the practical relevance of the learning experience, and this is another key *process indicator* in vocational education (see GDVT/GIZ 2014).

The TVET Reports 2011 and 2012 primarily contain input indicators (see Fig. 1 and Table 1). In this context, it should be noted that apart from the number of graduates (output metric) and the employment situation of graduates from institutions receiving funding from the *GDVT/GIZ Programme Reform of TVET in Viet Nam*, only input metrics and indicators are shown in Table 1. We therefore recommend that the following *process, output and outcome* indicators be included in the Vietnamese TVET system and the results presented in the TVET reports:

- Final examination pass rates based on mandatory examination standards (which conform to international standards) (see BIBB 2012, p. 119 ff.)
- The vocational training drop-out rate (see BIBB 2012, p. 104ff).
- The graduate employment rate (see Horn 2014a, p. 29).
- Evaluation of graduate competency levels (see *GDVT/GIZ Programme Reform of TVET in Viet Nam* 2014) and
- Evaluation of teaching skills and content (see Horn 2014a, p.30, Horn 2014b).

Note: The Vietnamese TVET reporting is currently based primarily on input indicators. Process, output and outcome indicators should be added in the future.

4 Practical tips and recommendations for NIVT

Finally, a checklist has been put together to provide practical tips for generation of the TVET reports (see Table 4). As is the case with the guidelines themselves, the main emphasis was placed on project management/design as well as indicator development which is so vital for TVET reporting.

If the questions cannot be answered with "Yes", a brief explanation should be entered in the comments column for your own use indicating what needs to be improved and by when.

Table 3: Checklist for the development of TVET reports in Viet Nam

No.	Question	Yes	No	Comments for own use
Organisational, human and technical resources needed to generate TVET reports				
1	Is it clear what needs to be done? Are the stakeholders informed? Have specific issues been clarified in view of current legislation or other considerations?			
2	Is there an official mandate for Vietnamese TVET reporting?			
3	Do the TVET reporting work groups at NIVT function on a continuous basis?			
4	Are sufficient human resources available to generate the reports?			
5	Do the persons preparing the reports have adequate qualifications? (If not: which employees need more training and for what skills? How can the training needs be met?)			
6	Have databases been set up in the different work groups and were the databases created using standard software?			
7	Are code books available for the databases?			
8	Are the databases continually maintained/updated?			
Scheduling				
9	Has the date been set for publication of the report?			
10	Does the schedule leave sufficient time to generate the reports?			
11	Has the deadline been set for delivery of secondary data?			
12	Does the schedule leave sufficient time for editing and translation?			
13	Is there a need to collect additional data? If so, when?			
14	Is there a need for data conversion? If so, how many steps and how much time are involved?			
15	Will the people generating the reports be given sufficient time off from their other duties?			
16	Has sufficient time been set aside to improve the quality of the indicators?			
Indicators and data				
17	Are all of the indicators based on formulated information needs and core deliverables which are derived from those needs? If not, which ones?			
18	Do the existing indicators refer unambiguously to observations? If not, which ones?			
19	Are all of the existing indicators based on defined terminology? If not, which ones?			
20	Are the definitions transparent and accessible by the readership? If not, which ones?			
21	Is the terminology aligned with the definition of terms as used in the vocational education sector and by other relevant data collection entities (e.g. government statistical offices)? If not, which ones?			
22	Are the data sources defined and reliable? If not, which ones?			
23	Are the time and place of data collection as well as the data collection intervals defined? If not, which ones?			
24	Are all existing indicators still relevant to the nature of the current issues? If not, which ones?			

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