



High Quality Teaching and Assessing in TVET: The Road to Enhanced Learning Outcomes

Series on Quality in TVET: Volume 2

Tertiary and Vocational Education Commission



High Quality Teaching and Assessing in TVET

by Markus M. Boehner

WHY this textbook on good teaching and assessing in TVET?

It is the ambition of this publication **to promote High-Quality Teaching and Assessing (QTA)** in TVET! That is why the acronym QTA is created, **constituting a catchphrase for improving teaching and assessing**, as the **qualitative heart and purpose of any training college or training center**, or indeed for any educational endeavor.

Perfect QTA is the ultimate goal, but never to be reached in full, as perfect QTA in TVET remains elusive. The reasons are new technical developments, new findings about effective teaching and learning as well as new insights into how the human brain works. These new developments constantly constitute a need for reform and change. **This dynamic nature of QTA makes refinements a necessity on a constant basis.**

That also implies that QTA is an ongoing process, which **can lead to interim high-quality plateaus to be proud of**, but as a **status-quo even such high achievements needs to be revised and revamped consistently** in the face of technological, technical and pedagogical novelties.

Therefore, QTA follows the proud tradition of general quality work, according to the principles of Total Quality Management: **“The process never stops.”**

That is good news because everybody gets bored by doing exactly the same thing day in, day out. So **academic directors and coordinators have to be on the lookout** for new teaching media and teaching methods that promise more efficient or more diverse learning. Lecturers and instructors have to screen their technical field for new developments and every player shall be aware of potential disruptions in entire sectors or certain skills. Occupations may even become redundant, only to be replaced by others (e. g. such as *shorthand* in secretarial work, having been all but replaced by computerized *word processing* or even *voice recognition*).

Consequently, **giving QTA full attention and highest priority is the mainstay of any TVET institution**. Neglect it, and you neglect your core. Ultimately, you churn out less competent or even incompetent graduates, inadequately equipped for ever-changing demands of labor markets.

This textbook provides theoretical background and practical help for training teachers and trainers, instructs academic directors and coordinators what to promote, supports management and regulatory bodies how to upgrade QTA and, of course, provides pragmatic advice for academic staff, experienced and teacher trainees alike, in their professional development. Finally, it offers a helping hand to everybody employed in TVET to unlock and **focus on what actually counts: High-quality Teaching and Assessing (QTA) in TVET.**

Good luck with your daily strive to implement QTA. It's truly worth it!

Your author, considering himself a truly dedicated teacher as well:

Colombo, August 2017

Markus M. Boehner

Preface

This textbook is structured into three sections:

- Part A: This section deals with the **concept of competence in TVET** and how the concept translates into good teaching and learning. Moreover, the basics and fundamental tools for competence-based **lesson and workshop planning** as well as **assessment** are introduced.
- Part B: This section comprises the “heart” of this textbook, as it **conceptualizes good teaching and learning** in TVET, organizes **teaching methodology** and provides manifold state-of-the-art examples for readily **applicable methods** in TVET. In addition to that, it lays the groundwork for day-to-day **evaluation of training** and introduces several examples for **modern tools of evaluation and especially assessment**.
It also points out how **good training center management** can contribute to the success of modern-day training and how to support center managers as well as what overriding **goals are omnipresent** in TVET.
The general aim of this part of the book is to propel training in TVET to modern standards and inspire TVET policy makers, teacher trainers, management and teachers alike.
- Part C: Finally, the last section is dedicated **to facilitate the implementation** of suggestions provided in this textbook, by introducing hints and workshop ideas how to put this book to action.

Overall, this textbook should be considered **a tool in itself to uplift the standards in TVET**. It may be worth being read in full, but it also serves as a resource book that can be referred to or looked into any time planning or evaluation of teaching and assessing is on the agenda.

That is why there was a **validation conference** congregating 20 prominent experts from the TVET sector, representing large TVET institutions, universities, private training providers, the regulatory body and ministerial interests to enhance the book.

The conference took place at Hector Kobbekaduwa Agrarian Research and Training Institute in Colombo on the 25th of July 2017; several changes were introduced in due course, depending on the capacity to pass the test of majority vote, in order to capture the prevailing view of the sector and to broaden the application of the book.

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List of Abbreviations

ADB	Asian Development Bank
cf.	confer, i. e. look into some specified literature
e. g.	short for exempli gratia, i. e. Latin “for example”
HoD	Head of Division
ibid	short for ibidem, i. e. Latin for “in the same place”
i. e.	short for id est = Latin for “that is” or “in other words”
ICT	Information and Communication Technology
ILO	International Labor Organisation
ISO	International Organization for Standardization
NVQ	National Vocational Qualification
OJT	On-the-Job Training in companies
QMR	Quality Management Representative
PPP	Private Public Partnership
QTA	High Quality Teaching and Assessing
RPL	Recognition of Prior Learning
SLE	Structured Learning Experience
TVET	Technical and Vocational Education and Training
WB	World Bank

Part A: Didactical Background in TVET.

The Basics of Teaching and Assessing Well

Didactics, very simply put, can be considered the **art of teaching** most efficiently (process of teaching) and most effectively (the outcome of teaching), i. e. doing the right thing for students and stakeholders alike, while also making teaching enjoyable for the motivated teacher. These days, didactics is entirely and comprehensively based on the **concept of competence** in TVET. So in order to teach well in TVET, it has become the *sine qua non* for any teacher in TVET to penetrate the concept of competence in full.

Chapter 1: The concept of competence in TVET

Recent developments in the perception of competence and definition of the concept are very pertinent to TVET, as its approach is largely functional in essence, which means that it is related to everyday applications, authentic tasks and generally contextualized (Klieme, Hartig & Rauch 2008).¹ However, the imposed high degree of standardization, going along with the concept from the 1980s and 1990s, has largely disappeared. That makes the concept truly accessible for TVET, as a notion of competence that only materializes in **real-life situations** and that can be easily occupational in nature.

Consequently, competence can be observed by evaluating the degree of success in dealing with work situations.

Generally speaking, the concept of competence in TVET comes in three levels:

- **Skills & Abilities,**
- **Knowledge and**
- **Situational Coping in any Occupational Context**
(generic situations of application),

plus a fourth psychological layer that has to do with **individual dispositions of volition and motives**.

That fourth layer involves the preparedness and willingness of a person to perform, concretized by the psychological **concept of attitudes**.

¹ Originally, several different concepts of competence were conceptualized by the renowned psychologist F. Weinert in 1999 and 2001 to smoothen the way for a conceptionalization of competence that can be used for large-scale assessment (Weinert 1999 and Rychen & Salganik 2001). The outcome of these endeavors is the ongoing *Programme for International Student Assessment*, a large-scale multinational empirical study, comparing educational achievements of many countries at the end of secondary schooling.

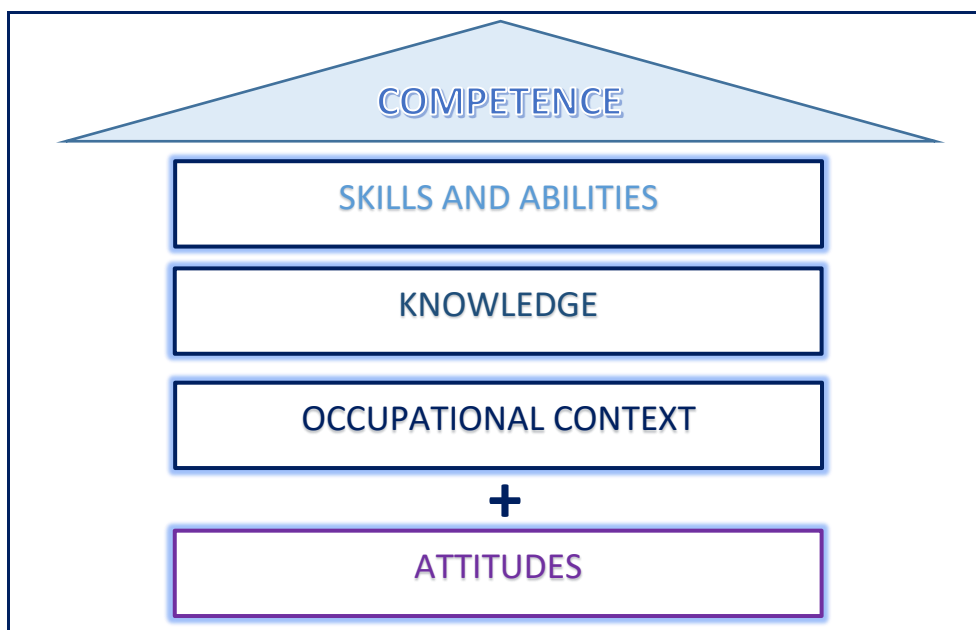


Figure 1: Four layers of the prevailing concept of competence

The first two layers belong to the internal sphere of what educational psychologists term occupationally-relevant dispositions, i. e. a collection of inner features that bestow the potential on individuals to successfully do something, while the third dimension of the competence concept captures occupational applications in real work life, determined by industry and sector experts.

Usually, when speaking about the **first layer of competence**, TVET experts only talk about skills. That is not entirely right, as in any occupation and in work life in general, employees need more than skills. They also need abilities, especially in the clerical field. To draw a distinction, the two concepts are defined as follows:

- **Ability** = the power to perform a certain practical task that involves a high level of cognitive awareness and steering
- **Skill** = the power to perform a certain practical task that involves a high level of routine and that is mostly done by handicraft.

In this book, we shall distinguish between the two terms. However, we should keep in mind that most key players in TVET use the generic term skills, referring to both skills and abilities.

QTA Key Insight No. 1:

Most practitioners in TVET speak of skills when they actually mean **skills and abilities**, or a certain combination of both.

The **second layer of competence** is the one that has been taught as a standalone for a long time, in the wrong-footed belief that technical knowledge alone will engender the capability to perform. It does not suffice, as we are aware of today! Hence the term of **inert knowledge**, capturing the notion of a body of knowledge that

an individual may possess but cannot apply in real-life situations. The reason is the individual does not have a clue how to put that knowledge to action.

Nonetheless, technical knowledge is needed to perform professionally and profoundly, as the **second component of the concept of competence**:

- **Knowledge** = the theoretical body of insights relevant in a certain area being purely cognitive in nature.

QTA Key Insight No. 2:

Knowledge simply shall never be taught in isolation. Therefore, purely theoretical teaching sessions are useless in truly competence-based training.

The **third layer of competence** brings about a very important part of the concept of competence that has been neglected oftentimes. Competence has to be demonstrated in real-life situations, showing the application of skills, abilities and knowledge, as all situations differ at least slightly from one another. Even in highly standardized work processes, the time of the day, outside and inside temperatures, type of customer and colleagues present may differ and cause some minor changes. Within such a framework, full competence has to prove itself. So only to cope with work situations provides evidence for the existence of a certain competency, and that more than once, to rule out coincidence.

- **Situational Coping** = the power to master the occupational context/work situations in different permutations, by transferring and applying knowledge, abilities and skills needed.

Knowledge, abilities/skills and situational coping are the three essential components of competence. All of them need to be addressed simultaneously in proper competence-based training.

The **fourth and conclusive layer of competence** is not always discussed in competence-based teaching and measurement, but is at least equally important in TVET. This layer consists of relevant attitudes and determines whether or not an individual has the inner motivational and volitional prerequisites to put her skills, abilities, knowledge and situational coping power to work.

- **Attitudes** = a combination of cognitive (beliefs), affective (feelings) and behavioral or conative (action) components (as a result of an analysis of a multitude of educational psychology models on attitudes, see Corno & Anderman 2015).

Attitudes are complex constructs, but do explain a great deal of performance and work behavior:

“An attitude is not passive, but rather it exerts a dynamic influence on behavior.” (Jain 2014, p. 2)

As a consequence, attitudes should always be addressed in technical and vocational education, best simultaneously with skills, abilities and knowledge, essentially combining the training of hard and soft skills intrinsically. How this can be done in a

meaningful way in TVET, we shall see in chapter 6 that deals with pragmatic teaching methods and provides valuable hints.

QTA Key Insight No. 3:

To foster appropriate attitudes, training of hard skills (technical abilities, skills and knowledge) should always and inextricably be combined with soft skills training (social, communicative, methodological and personal abilities, skills and knowledge).

After having discussed the four layers and components of the competence concept, we need to define and understand the term itself. In colloquial language and even in everyday discussions among TVET practitioners, **competence** and **competency** are terms used interchangeably--and usually as synonyms.

To be precise and pedagogically correct, a distinction must be made, however:

- **Competence** = the **outcome** of training and informal learning at work in terms of all **knowledge, abilities, skills and situational coping power** acquired to succeed in a certain occupational field as a conglomerate of different potential work situations. Indicative for the comprehensive nature of the concept may be that competence has no plural in English!
More modestly, the term can also be applied to the outcome of a module or area of learning in TVET.
- **Competency** = **one certain aspect of competence**, sometimes also denoted as a **standard**. A bundle of competencies or standards in a certain occupational field, as identified by industry, makes up competence in a given trade (e. g. “the ability to communicate well with clients/customers/patients” as one competency, of say a Nurse or a Personal Secretary).

That said, we have to turn our eyes to what these rather theoretical musings mean for practical TVET on a day-to-day basis:

a whole lot, as matter of fact!

The concept has grave consequence with respect to **how teaching and training is to be conducted**, in order to live up to the label “**competence-based**”.

There **a five major principles of competence-based teaching** and how to assess in a germane manner in TVET:

- (1) In-depth Learning
- (2) Exemplary Learning
- (3) Experiential Learning
- (4) Problem-Based Learning
- (5) Reflective Learning.

These principles will be delineated and illustrated with specific teaching methods in Part B of this book. Instead, we will turn our attention to the **basics of competence-based teaching in TVET** at first, and how lessons and practicals should be structured.

Chapter 2: Competence-based teaching and learning

Knowing what layers the concept of competence consists of, teachers should altogether get rid of the notion that they can teach knowledge independently, i. e. in a classical lecture on theory.

Already the **concept of “theory” in TVET is mistaken**, as theory (i. e. understood as pure knowledge or content) is inextricably interwoven with skills and abilities in the competence concept. So there is no such thing as teaching abstract theory that is meaningful in any way for application in the world of work, or even possible. That is a taboo, if teachers want their students to be equipped for life.

Starting with an early insight springing from A. N. Whitehead's *process philosophy* in the early 20th century, study upon study have piled up evidence that pure theory teaching in TVET commonly results in **inert knowledge**, if at all in any knowledge base. Mostly theoretical knowledge input is quickly and profoundly forgotten, especially if presented via lecture and verbally only. Disbelievers may consult the bulky scientific evidence for the overwhelming inefficiency of pure theory lecturers in TVET (see Stark et al. 2007—for discipline-based newer findings, e. g. Larsen-Freeman 2013 or Miligan & Wood 2010).

QTA Key Insight No. 4:

The **inert-knowledge problem** calls the following teaching modes into question entirely: (1) abstract theory lessons, (2) the methodological concept of lectures and, more generally, (3) longer teacher-centered talks that fail to include student-activating application. The result of such modes is knowledge that cannot be used in real-life situations because transfer is impossible. The knowledge is fact-based and insulated in the learner's brain—and to large degree quickly forgotten.

Already the so-called *Ebbinghaus Curve*—conceived more than a hundred years ago--shows, after research being conducted in the field of educational psychology, that even for intellectually highly capable and attentive students, a high percentage of information delivered in the lecture mode is forgotten within a time frame of little more than two weeks (cf. Saha & Dworkin 2009), as the basic rate of forgetting differs little between individuals if no retention techniques are used:

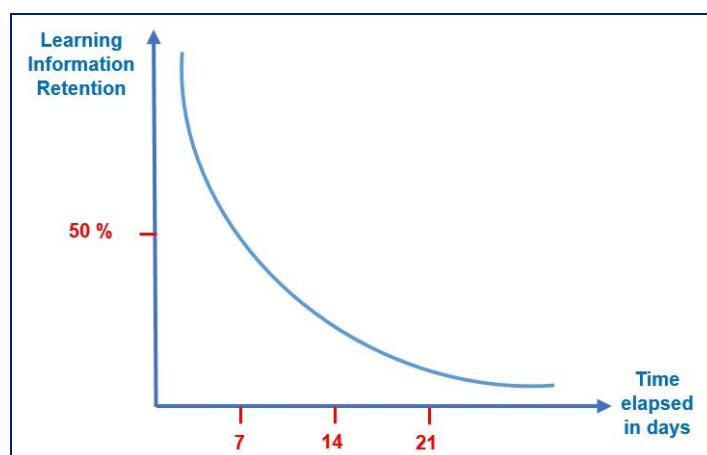


Figure 2: Forgetting curve in TVET

Today we know that there are different causes for forgetting, such as distraction, lacking personal relevance, no prior cerebral anchors, no repetition, no social exchange about topic etc. Additionally, there many techniques how to prevent that or to slow it down. But that does not change the basic fact that theoretical information is quickly forgotten—and even if retained, it becomes inert, i. e. **not retrievable in work situations** (see paragraph above).

QTA Key Insight No. 5:

Theory information presented in isolated fashion, e. g. in lectures, is forgotten very quickly to a high percentage, or even not learned in the first place, as attention may be insufficient or even not prevalent at all.

To take such a basic insight seriously in TVET institutes, decision makers and management of institutes have to **do away with the man-made and laboratory-like separation of theory and practice**, or with its organizational counterpart in TVET: theory lessons and practicals.

Any teaching and learning session in TVET should be based on practical experience, and allow for reflective intermissions and phase

s to become aware of knowledge background and knowledge components, embedded in practical working and doing.

QTA Key Insight No. 6:

The artificial **separation of theory lessons and practice-based teaching in workshops (practicals) should be eradicated** in TVET. Any teaching and learning process should be practice-based or practice-related and interweave knowledge

background and skills to be acquired. That will make reflection phases indispensable in between and at the end of any TVET session taking place.

What is the result of such irrefutable facts of teaching and learning in TVET?

As a matter of fact, TVET students are later-stage adolescents or young adults, so delivery modes should be fine-tuned to adult learners, living up to the demands of so-called andragogy, i. e. a pedagogy especially adapted to adult learners' needs (see Knowles 1984).

Malcolm Knowles postulated ground-breaking rules for adult learners that apply to TVET students and lay the foundation of competence-based teaching these days:

- TVET students are **more self-directed** than younger learners, having their own agenda already. They rightly expect TVET to take that into consideration.
- TVET students expect their learning to be catering to their career and personal interests and to be leaning towards **direct application**. That is why teaching of abstract facts, that is considered useful by lecturers, often leads to rejection and a lack of interest.
- TVET students already have accumulated a great deal of learning and real-life **prior experiences**. Teaching must build upon that and develop existing competencies, in order not to pretend that students are complete “blank slates”.
- TVET students are harder to motivate via external stimuli (e. g. tests passed, good grades or parent's praise). Rather, TVET teachers must find out about and tap **internal areas of curiosity and motives**—or even try to create curiosity.
- TVET students should be taken seriously, i. e. asked what they want and their feedback taken, in order to **refine teaching according to their wishes**.

These andragogic rules favor certain modes of teaching and disqualify others, leading to the five principles of effective TVET delivery, as stated in the previous chapter and expounded later in this textbook (Part B, esp. Chapter 5 and 6).

QTA Key Insight No. 7:

Student learning is predominantly self-directed in TVET, immediately relevant to (work) life and building upon individual prior experiences and interests as well as being co-determined by students.

For recent findings and applications of andragogic rules in teaching and learning, consult Jatkauskiene & Trakselys (2015).

That carries us to another technical term of paramount importance in TVET that is supposedly competence-based: **delivery of training**.

Delivery, as understood by its literal meaning, is **a misguided concept that does not go down well with modern teaching and learning** and fostering of competencies in TVET.

The term is used in quality development as well (see e. g. ISO 9001:2015 standard and the work agreement for implementation in education IWA 2:2007), but would not have been introduced from a pedagogical perspective, as the connotation conveys a very wrong message. The reason is that the sheer linguistic association of “to deliver” portends an active teacher and a passive student-listener, which severely hurts the postulated rules of adult student learning.

So TVET is not being delivered by any teacher or authority. Instead, TVET is unfolding in a mutually supportive learning process of exploring, getting to know things and working on or simulating as well as cooperatively solving real-life tasks and problems that are inspired by the real world of work. Ultimately, learning outputs are subjects of intense discussions and presentations. Then the learning process and output is reflected with regard to intended outcomes, i. e. the development of student competencies.

QTA Key Insight No. 8:

“Delivery of training” is a misconceived linguistic conception, as training in TVET must be cooperative, self-directed, inquiry-based and reflective, in order to involve learners actively and promote insight alongside competence development instead of passively observing “something being delivered”.

Henceforth, **“delivery”** shall be understood as **“practice-relevant and interactive”** training, as the term is deeply entrenched and will be difficult to root out, as desirable as that may be.

We have seen by now that competence-based TVET must be student-activating--and not being delivered--, relevant to practical work and designed in a mode of instruction that facilitates long-term retention. The high chance of forgetting in traditional teaching shall be countered by integrating knowledge and abilities plus skills in tasks and problems to be solved.

Pragmatic QTA Hint:

The term **instruction** can **easily be misunderstood**, as “to instruct” is frequently associated with an active teacher lecturing, and a passive student listening.

That would again be the wrong message to teachers, as the acquisition of competencies by adult TVET learners is being self-regulated, instead of being instructed.

As a result, **“mode of learning” would be a far better concept that “mode of instruction”!** As “mode of instruction” is an established concept for the way of teaching organization of a session, **we will not rule out its usage**. However, the well-informed teacher should **beware of the caveat involved!**

Bearing all the findings of this chapter in mind, we can elaborate a model of how a competence-based session in TVET should ideally look like. Each session must consist of a minimum set of phases. This set can easily be extended and be framed in a more complicated set of phases, but the following model will illustrate the minimum number and sequence of phases of any “good TVET teaching and learning session” that is competence-based in nature.

The following figure shows the **phases of teaching and learning in a prototypical institutional TVET session**, no matter if labeled as theory class in a classroom or practical in a workshop:²

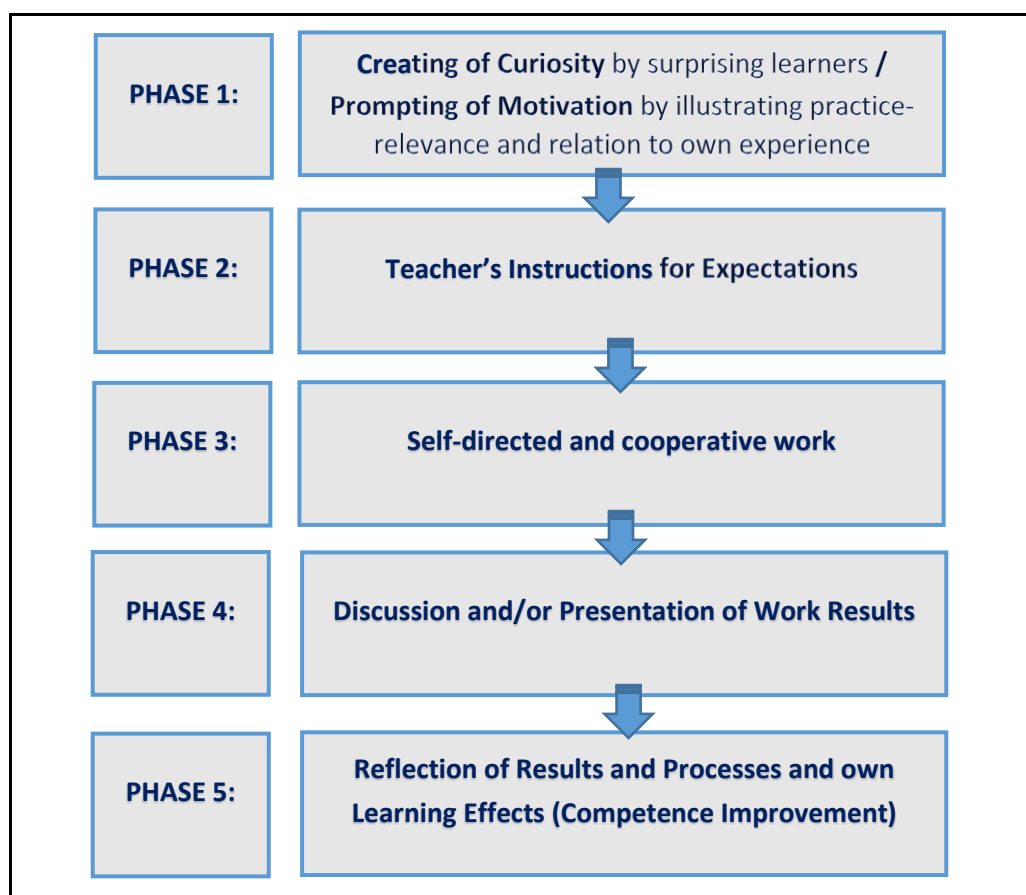


Figure 3: Phases in any competence-based TVET session

The five phases given in the diagram above are to be included by a TVET teacher in any direct student teaching contact, no matter how long the session is. This can last from 45 minutes up to an entire day or more.

That said, one can infer that **the five phases may be modeled at any length**, depending on the task at hand to be performed and the complexity of the competencies to be acquired.

The phases come in a sequential order, as they build upon one another:

² This model of optimal training phases refers to **institutional training only**. In any successful training program, **industry exposure** is equally important, but follows work-oriented learning procedures.

Phase 1 (Curiosity/Motivation): In that first and important phase, the teacher makes a conscious effort to **link up to relevant experiences student already possess, tries to create curiosity and spurs learning motivation** by surprising learners. It also makes sense to identify particular interests to cater to. Obviously, when students are in the process of working out something and the teaching has to be stopped (e. g. end of teaching time on one day, to be continued on the following day) timewise, then teaching does not start with phase 1 again, but in the phase where the session was interrupted.

Phase 2 (Learning Instructions): At that point, a **teacher explains the work-relevant task or problem, which is to be independently solved by students**, and gives exact work instructions, i. e. time available for independent work, pair or group work arrangements. The teacher lays out the material available and reveals the expectations regarding the final product. The teacher may provide the students with the relevant technical foundation at this point, if necessary a short interactive lecture or presentation of background information needed. That teacher-centered phase should be as short as possible and only use such methods as illustrated talks or demonstrations if the group of learners consists of absolute beginners without prior experiences and if are likely to fail when asked to research the information on their own.

Phase 3 (Self-directed Work): That phase is set to be the longest and makes up the bulk of time of the planned learning arrangement, as students are **mostly self-directed learners** in this phase, interacting with peers in group work and via verbal communication. The role of the teacher in the work phase is that of a facilitator, organizer and expert to counsel if necessary.

Phase 4 (Discussion and Presentation): After the students have completed the task at hand, they have come up with a learning product, either physical that has been manually fabricated or at least a poster, multimedia presentation etc. In any case, **the process and the product have to be discussed with peers and presented**, either in a plenary session or an altered group composition.

Phase 5 (Reflection): This phase is frequently forgotten in TVET, but educational research has clearly found out that **students always need to reflect on their learning process and outcome**. Firstly, this is to make them aware of what they have done and achieved, and secondly, to look for improvements and to self-evaluate. Ultimately, the reflection phase supports long-term retention and fosters competence development in terms of self-awareness what one can actually do and what the individual still has to work on. Reflection can be done with all learners, in groups, pairs or written style, depending on trust, confidentiality, time available and purpose.

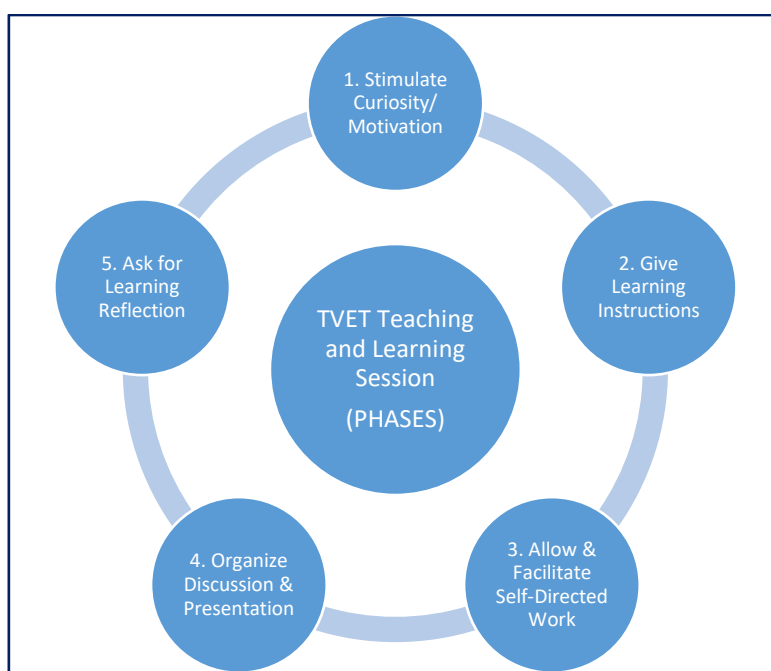


Figure 4: Necessary phases in modern TVET learning processes

QTA Key Insight No. 9:

Any fruitful and coherent teaching and learning session consists of a minimum set of five phases that need to be arranged in sequence:

- 1) Creating curiosity/motivation,
- 2) Instructing about the expected work process,
- 3) Self-directed and goal-driven working, supported and facilitated by the teacher,
- 4) Discussing and Presenting Results as well as
- 5) Reflecting Learning Effects.

These phases will be repetitive in new learning sessions targeting the development of different competencies, according to a given curriculum and the more refined planning instruments such as teachers' lesson and training plans.

In the end, teachers need to be aware that this is phase system is not set in stone. Rather, teachers can plan on, for example, interim reflection phases that interrupt longish working phases, or interim presentation phases for the status quo of work results. Or teachers can even give further instructions and additional information, if the work process is not proceeding adequately. Several other extra phases are possible as well, **but the five minimum phases should always be envisaged during planning**. Top-ups are always possible.

Chapter 3: Planning of teaching and learning

Since it is evident by now that a typical and well-designed session in TVET should be planned well ahead and structured into phases, it makes sense to take a look at the planning of teaching and learning in training institutes in detail.

3.1 Background on the need for planning in TVET

As well established after some decades of research on teacher competencies, there are three main competence facets of an effective teacher in TVET, each one a complex construct of abilities in its own right (Bloemeke et al. 2008):

- **Planning competence**
- **Implementation competence**
- **Reflection Competence.**

In this chapter, the emphasis is on planning competence only. Implementation competence takes center stage at the methodology chapters and reflection competence constitutes a common feature of a high quality teacher in TVET, always contemplating how to get better and document one's cogitations for coming back to it later (see Boehner 2017).

Pragmatic QTA hint:

By the way, it is suggested that **TVET teachers keep a *reflective learning portfolio*** to document their process of enhancing and streamlining their own performance. In a professional world of TVET, these portfolios can be utilized during promotion procedures and regular staff development meetings as well.

While the competence to implement and to carry out lessons and practicals has a strong connotation to communicative, social and adaptive skills, i. e. the quintessential skills to deal with, lead, instruct, counsel and inspire youngsters, the third essential teacher competence to reflect on their performance is very introvert and evaluates achievements and shortcomings to do better next time. For a deeper insight into a teacher's competence to reflect upon her planning and implementing abilities as well as the potential to improve, to consult the recommendations of the research field on 'reflective practitioners' may prove propitious (cf. originally Schoen 1983).

Since the two competencies of implementation and reflection are very important parts of a TEVT teacher's package of abilities and skills, they can be catered to and trained

- (a) **via workshops** with regard to teaching methodology and communication as well as interaction training (see Boehner 2015 and Boehner 2017).
- (b) **via reflective instruments** such as development portfolios and the introduction of means and instruments of **student feedback** (cf. "the reflective practitioner at work" in Dana & Yendol-Hoppey 2009).

However, every real teaching phase, long-term steps and follow-up pedagogical measures are based upon a thorough lesson preparation, which is a very cognitive process:

Pragmatic QTA Hint:

The better prepared a TVET teacher is, the more likely is that the teacher will feel safe and professional in the classroom or workshop.

It is more likely that effective methods are employed, a structured session takes place and student deviations are dealt with properly if the teaching and learning process is planned thoroughly and professionally.

The reason is that a well-trained teacher can even anticipate certain teaching pitfalls and student misbehavior of certain batches or individuals and treat them accordingly.

The cardinal insight is very perspicuous:

Planning competence is essential in successful TVET sessions.

QTA Key Insight No. 10:

The planning of lessons and workshops should be high on the agenda, for teacher training courses, training institutes, regulatory bodies, but in particular for individual TVET teachers as a professional implicitness to conduct meaningful, structured and consecutive teaching sessions. Therefore, **appropriate planning tools need to be applied**—see examples in this chapter.

Even teachers that are good improvisers may do well for a certain time without much planning if they can draw from rich teaching experience, i. e. they will muddle through more or less. But, ultimately, consecutive teaching will be a piecemeal solution at best, and even the teacher's feeling to *ad-lib* on a daily basis will be very unprofessional and bad for self-esteem.

No doubt about that: A well-prepared teaching session does feel good, for teachers and students alike!

Pragmatic QTA Hint:

Teaching plans have many denominations, such as **lesson plans**, **workshop plans**, **training plans** or even **scheme of training**.

Essentially, these are **all synonyms that require a systematic approach to plan teaching and learning** sessions in TVET—and store the outcome in some file.

Students will sense it if teachers are not well prepared. The proven consequence is that students become less motivated and maybe even disoriented. The teacher instinctively knows that outcome and will feel insecure, inappropriate and inadequate in his job, because the teacher understands full well that a professional pedagogue should come prepared, always.

That does not mean a lot of extra work. In their first years, TVET teachers will have a lot of work to do to come up with their individual teaching plans, but they can borrow from colleagues and their department—and fill in the gaps or alter aspects that fit their personalities as pedagogues better. Moreover, they should insert new and modern teaching and learning methods.

QTA Key Insight No. 11:

A **lesson plan is a personalized tool** because not all methods fit a certain group of learners, neither each teacher's personality (cf. Spalding 2014).

TVET institutes should have general guideline teaching plans (also called: local syllabi), but the detailed planning should be left to the teachers.

The format of detailed teaching plans should be left to individual teachers, as they know best what goes best with their needs.

However, the TVET institute should also insist on some planning framework that is applicable institute-wide and that safeguards internal standards as well as the implementation of curricula and course objectives. Naturally, these institutional plans (local syllabi) should be less comprehensive and focus on the basics. Methodological planning in detail should be considered the “pedagogical prerogative” of the individual teacher and left to them on a daily basis.

Key Insight No. 12:

As lesson plans are an individual tools to evince planning competence of each teacher, **the format should be left to the author** (cf. Staub 2004). The reason for that is that some individuals would rather have 10 columns in a lesson plan, while other teachers can easily work with two (see examples given below). That is alright, since it only displays certain likings and preparation needs. As long as a lesson proves to be well thought through and planned, any format will do that accommodates the needs of the students. (cf. Paradiz 2012)!

Nonetheless, lesson plans should come in the **form of a table or a spreadsheet**, which proves easily accessible to third parties.

In any TVET system, there are generally already existing forms, published by regulatory bodies etc. They can still be used for general guidelines, contents agreed upon etc. in any given institute. They should, however, not be binding, as this destroys creativity and flexibility of the instrument.

Key Insight No. 13:

Given the fact that lesson plans are individual tools of preparation, they should at least **exhibit the five phases of good teaching** (cf. Wilson & Poulter 2015).

Again, there are no mandatory phases to follow in TVET in any given teaching plan, but in can be stated that the prevailing view in teaching research asks for a general framework that separates at least four main sections that can be subdivided into several more, according to an individual's inclination to detailed planning (see chapter 2). The following sections should be covered by any planning tools **as a minimum requirement** to be described:

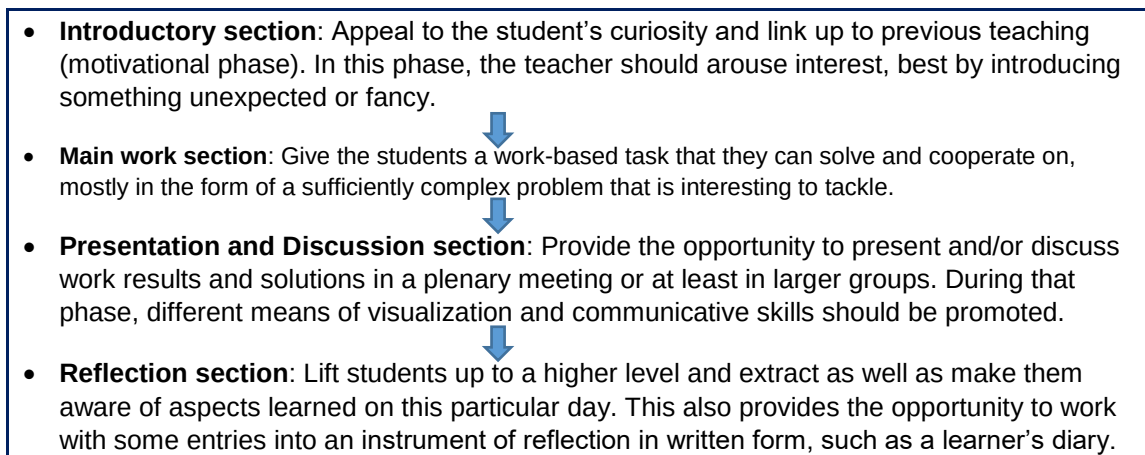


Figure 5: Four mandatory minimum sections in any planning tool

Naturally, there are notable differences in planning tools when dealing with theoretical lessons, workshop or simulation practicals or even demonstration sessions. Even in so-called theory lessons, work-life problems that relate to work-relevant situations should still be dealt with. And nevertheless, workshops or simulation sessions should follow these phases (according to figure 5); even demonstrations should heed the phases and ensure student observance activation during demonstrations, e.g. by means of observation sheets to be filled in.

Otherwise, no matter what the nature of the TVET session is, the general guidelines of the four phases are **generally applicable**.

3.2 Planning tools in TVET

Ultimately, it is crucial to dedicate some attention to the actual format of such plans of teaching and learning. As stated above, there is no need to introduce a universal and one-size-fits-all format, but a few elements should always be constitutive components of any written teaching plan, such as:

- **learning objective(s)** with respect to the competencies to be fostered
- subject-related and **work-related context**
- relationship to competency standards and/or the **competence-based curriculum**
- **timeframe** of teaching session and potential homework
- **description of work-based problem** and student task / assignment.

There is no need to state these elements in the same order, but any plan must somehow comprise these basic pre-requisites of planning, to retain some overview and to be accountable to third parties.

QTA Key Insight No. 14:

The **main thrust** of a planning tool should be to **facilitate teaching for the teacher**, and help never to lose track during an ongoing lesson.

According to these insights gained, the following exemplary potential planning tools for practical planning work are introduced. They are useful for different groups of addressees, depending on the status and experience of the teacher:

- teacher trainee,
- experienced teacher or
- expert teacher or even master teacher trainer.

Teaching and Learning Planning Tool – Sample No. 1

An **easy version** is provided for very experienced expert teachers in TVET, to collect professional planning thoughts pragmatically and jot them down. That tool may well be sufficient for the professional teacher. The outcome may look like this:

Day No. ... in class/workshop: Batch: ...	
Time frame: ...	
Beginning & Remembering:	Students present homework and peers as well as teacher ask sticky questions (perfect solution goes on whiteboard)
Task introduction and work phase:	Groups get jigsaw on "how to assemble a motor block" (two tables joined for each group, teacher walks about, counseling and supporting)
Continuous Assessment:	Each individual writes short entry into "development portfolio" about essential of engine components (teachers again walks around and reads exemplary passages)
Presentation phase:	Take a picture of jigsaw with smart phone, send the picture to the cloud storage (Google Drive) and access it plus project it to a wall (groups discuss at least three competitive solutions) - groups draw lots who presents (teacher comments only in the end)
Reflection and transfer	Sitting in a circle on chairs, students throw a tennis ball to one another, students comment on reflection question ("What have I learned today?") – finally, students write entry into their LEARNING DIARY "What can I use it for in a garage at work?" (The entry is the starting point for tomorrow!)

In a more sophisticated approach, one may, of course, refer to the curriculum and applicable standards or maybe to some in-house syllabus as well, and give the time frame for the respective phases.

QTA Insight No. 15:

With the example above, **expert teachers are already perfectly fine in terms of their planning competence**, if they stick to their plan and can fill in the "blanks" by means of their professional experience, such as how to present the task, which media to use and how to counsel or determine the groups. But this can be done if teacher are of the "experienced and well-trained sort" (cf. Graves 1996).

For novice academic staff, not too long after their initial teacher training, or personnel that started teaching no longer than a couple of years ago, **a more comprehensive planning is strongly recommended**, to build up planning competence that takes a lot of practice and experience. Even very experienced teachers in TVET might want to compile such a more substantial planning tool occasionally, either for peer counseling or superior observation events.

For a detailed example of such a planning tool, see the following table:

Teaching and Learning Planning Tool – Sample No. 2

“My Lesson Plan” for today				
NCS and CBT Curriculum relation	Level 5 “Production Technology” NCS revised 18 Nov. 2016, CBT revised 18 June 2017 Module: IT in Production (No. D29C001M04) Related Unit taught today: Plan Production Process (No. D29T001U04)			
Subject and Context	Information Technology Wider Context: “The student is asked to plan the production of soda cans in a simulated company.”			
Description of problem & task	“The company ‘Sodas Ltd.’ is about to increase production because of higher demand for 9,000 cans a day to 15,500 cans a day. The students shall calculate the need of extra human resources; we anticipate that trainees will be as productive as the given staff.” (See competence element 4 “Determine manpower” in NCS).			
Learning goal: (Competence component)	The students are able to calculate the requirement of workforce numbers and hours as well as the distribution on given machinery, using spreadsheets and given data. (Constraint: Machinery capacity has to be taken into account!)			
Time 120 min	PHASE	Student Activities / Methodology	Teacher Activity & Learning Aids	Resources & Remarks
15 min	Motivation	Problem introduced via appealing YOU-Tube video	Multimedia Projector, Internet connection and screen needed	Test beforehand! (Save to hard-drive if streaming does not work)
5 min	Work instructions	Active listeners	Instructions explained via digital slide or transparency	
70 min	Self-directed Work	Pairs generate solution spreadsheets on computer	Teacher walks in classroom and counsels	Computer room needed, software EXCEL must work
20 min	Presentation	Two selected pairs present and explain their solution: control group that is determined gives feedback	Teacher as expert is part of the learning group	Projector needed, connected to student’s computer
10 min	Reflection	Taking personalized notes about the abilities acquired today	Teacher observes, maybe counseling	Learner’s Diary

QTA Insight No. 16:

TVET teachers should always be able to **demonstrate their planning competence**, just as displayed above, during teacher training and for observation of teaching by superiors and inspectors!

During their initial studies and training or practical teacher training, teachers-to-be or teachers in continuous education should be asked to work out very detailed and well-grounded teaching and learning plans that anticipate lessons and workshops in great detail, e. g. when it comes to methodology, media, actions, requirements, context and the specific group of learners.

The following tool introduces such a sophisticated example as a extensive planning instrument. Such a tool is be insisted on during teacher training in particular, pre-service and in-service:

Teaching and Learning Planning Tool – Sample No. 3 (Time: 60 min., Relation Competency Standards and Curriculum, Goals etc. as above)				
~ Time/ ~ Minutes	Phase	Student Learning Action & Teacher Action (to consult intended competencies, see long-term plan as attached)	Methodology	Material / Media / Rooms
~ 8/8	Beginning Situation	e. g. The students are asked to tick their prior experience on a poster with a continuum from 1 to 10.	Self-Evaluation, Standing open half-circle	A poster with a picture of a production line and the question: “Do you know how to man that one?” plus a pin board (in classroom)
~ 2/10	Student Task Explanation	e. g. The students will settle in pre-determined groups and will form expert groups with respect to the optimum manpower needed (different fact sheets in expert groups).	Teacher Presentation	OHP and transparency (or laptop and projector)
~ 20/30	Self-regulated Work Phase	The students engage in group work, coming up with expert knowledge regarding manpower.	Group work in pre-determined heterogeneous groups; Expert method	Data Fact Sheets of production as hand-outs
~ 15/45	Student Presentation	A selected representative presents solution (pairs may be fine as well – but the best students are ruled out by the teacher!)	Poster presentations, control groups comment	Spreadsheet solution on displaying device – and copied to blackboard / whiteboard
~ 10/55	Student-Teacher Discourse	Results are comprehensibly discussed with teacher; student note-taking in note book.	Sitting in closed circle	Fact Sheets on laps
~ 5/60	Reflection	Entry in Student Development Portfolio: “What have I learned new and how may I need it at my potential workplace?”	Silent written reflection (used as opener in next session as well!)	Student Development Portfolio

This extensive planning tool is based on a phase-based interpretation of the student-centered approach to learning, i. e. containing a longish phase of self-regulated and at partly self-organized, but teacher-coached learning.

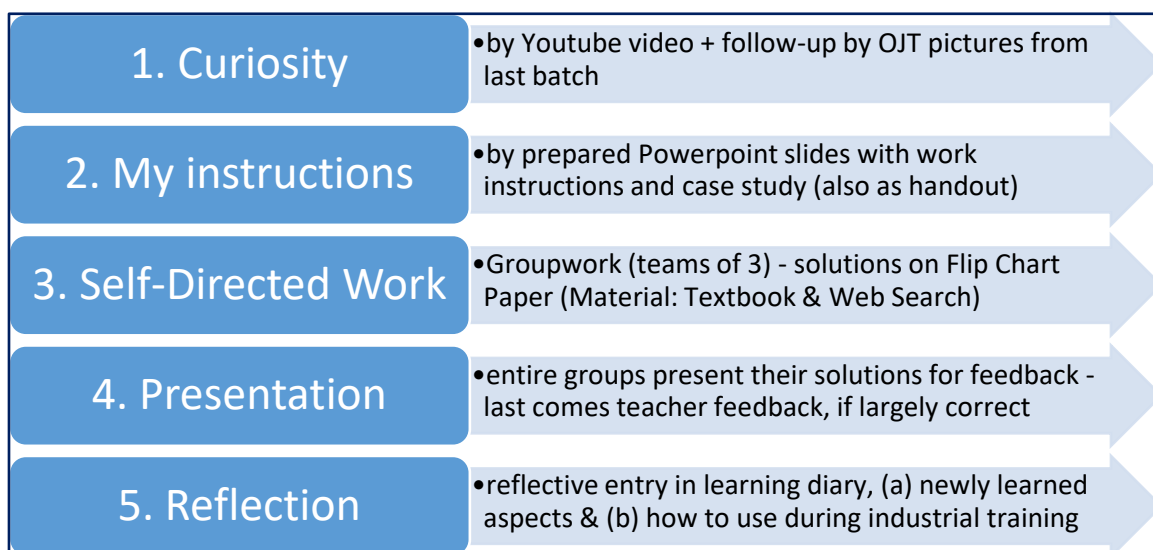
To repeat one insight: different models of phasing for teaching sessions are possible and feasible as well!

(For more information, see Boehner, M. M. 2015, Berlin: Cornelsen Publishing House)

Well, that said, the author has to admit that there are even more pragmatic tools applicable, as **used by master teacher trainers** that have a vast repertoire of teaching and learning methods and media at their immediate and diverse disposal for diverse student activities.

If you are such a highly professional TVET teacher, the following straightforward tool may be sufficient. It pursues a bullet-point based approach on a note card (This approach is not to be repeated by non-expert teachers!):

Teaching and Learning Planning Tool – Sample No. 4



Such a minimum planning tool expects truly some deep-rooted expertise in how to organize teaching and how to implement it. Tool No. 4 should not be used for institute-wide planning either.

QTA Key Insight No. 17:

The type of planning tool adequate for TVET teachers **depends on the level of experiences and pedagogical expertise as well as the purpose**. The rule of thumb is the more expertise and experience, the less comprehensive the planning tool needs to be.

Institutional planning tools should be of medium detailedness, such as provided in planning tool No. 2.

3.3 Clarification of planning tools for TVET sessions

Unfortunately, there is a lot of confusion in practical planning what different terms, that are frequently used, actually mean. That is why this text book makes an effort to unify the usage of terminology in TVET.

The following clarification presents an attempt in that direction:

(a) Course:

The concept of a course generally includes several subjects or modules and sometimes even comprises more than one curriculum to be used. Mostly, a course takes place in adult and higher education, leading up to some qualification or certification that can be used in the labor market. A course can be designed by a state authority, a college, a training center or a school alike, depending on official stipulations for course design in Higher Education and TVET. If the course is mandated by an official body, as the case with trades and qualifications that are mapped to a National Vocational Qualifications (NVQ) Framework, only one official curriculum may apply for the entire course.

(b) Curriculum:

The term has Latin roots, but has been transformed and used for hundreds of years as the ultimate resource and general guideline for teaching processes as well as the planning thereof. It is decreed by some authorized official body, usually the government, i. e. some ministry, official agency or regulatory body in charge, and it is mandatory to heed for all institutes and teachers, in the public and private sector alike.

These days, after the paradigm shift towards competence-based education in pedagogy, curricula may simply contain minimum requirements in terms of a collection of competencies. That is a number of hard and soft skills, abilities and knowledge mastered in real-life situations, to be acquired by students at the end of a course or a year of study/training.

A curriculum can also be broader in scope. In this case the curriculum contains competencies, frequently based on competency standards as laid out by industry-driven bodies, mapped to certain qualification levels (e. g. levels of National Vocational Qualifications), assessment guidelines and teaching hints. Such comprehensive curricula combine several competency standards into modules and add teaching tools such as resources, prescribed texts/references etc.

Many countries still take such a fairly comprehensive approach to curriculum development. The use of the two components “National Competency Standards” and “Competency-based Curricula” that are made mandatory for all TVET teachers is also wide-spread, but a quite cumbersome concept for practical purposes.

The approach is not pragmatic and not suitable for the necessities of adaptable teaching and learning in modern times, as more trust should be put into well-trained teachers to shape appropriate practical and lesson units. Therefore, the focus should shift to lean competence-based and open curricula these days.

QTA Key Insight No. 18:

In TVET, competence-based **open curricula** must be the norm to ensure flexible and up-to-date teaching, i. e. “open curricula” are all the rage in competence development.

That is why open curricula are currently becoming ever more prevailing in TVET, with open meaning more leeway and flexibility when it comes to skills, abilities and content being taught and learned.

That does not mean to completely give up a collection of core competencies. But curriculum developers should restrict themselves to such a basic specification of objectives to be reached, potentially alongside a few teaching hints.

Such open curricula may have a modular set-up; and modules bundle closely related job functions, expressed in competencies identified by experts from the field. These competencies are unpacked into relevant knowledge and hard plus soft skills as well as the delineation of typical work-life situations. Several modules **are packaged** to form entire curriculum for a given qualification, a certain trade or occupation. It is possible to integrate some over-arching **basic modules** as well, usually on

- employability skills, i. e. key competencies underpinning technical expertise
- basic technical skills underpinning all work in a given sector
- job-related communicative and foreign-language skills.

These three modules are **optional** in curriculum development and will not be needed for all qualifications, as basic, employability and language skills may be nicely integrated in other technical modules as well.

A **modern, open curriculum** may consist of the following components:

Module Title:	
Part of which Qualification:	
Reference to potential Competency Standards:	
Notional Learning Hours & Credits:	
Teaching Contact Time:	
Exact Competencies (job functions and soft skills) and descriptions:	
...	

Typical related work situations to master: ...	
Important pertinent Content (knowledge):	...
Potentially useful teaching and learning methods (optional):	...
Potentially useful methods for formative and summative assessment:	...

Figure 6: Potential layout of modern open curriculum in TVET

QTA Key Insight No. 19:

It is important to distinguish between **notional learning hours** and **teaching contact hours** in reading curricula properly. Notional learning hours specify the expected amount of time any average trainee needs to reach the outcomes spelled out in the competencies section. That may include practical training, self-study, homework, projects, assignments etc. While teaching contact hours are the exact time trainees spend with their teachers, even though that time may be partly transferred to e-learning parts, having the potential to replace direct teaching contact hours to a certain degree.

To make modules easier to handle for teachers, the form of a module should comprise just **one page**. The number of modules that make up a qualification depends on the length of the course and the scope of each module.

Before module descriptions are listed, a curriculum may outline the line of thrust in terms of **pedagogic principles of delivery**, such as competence-based and problem-based training, action focus and student-orientation as well as modern assessment and counseling guidelines.

Modules must undergo a **regular revision** in TVET, at least every three to four years, demand-driven and guided by technical experts from the private sector.

Pragmatic QTA hint for modern curriculum development:

Generally, open curricula support trainees to become **self-directed, self-reflective** learners, equipped for the world of work in the 21st century, in which knowledge and skills needed are changing every three to five years now (see Special Report on changing skills in “The Economist” as of 25th June 2016).

Against this backdrop, teachers must make use of open curricula in the right way, i. e. calling for the relevant soft skills mentioned above consistently.

That is the best reason why **future teachers** should be trained according to open curricula themselves, to experience what they are going to practice in future themselves: **“Practice as you preach.”**

Next to identified technical knowledge and skills in a certain field, trainees should be educated in **soft skills** extensively, as an **integral part of each module**.

Consequently, a few soft skills should be spelled out in the modules as well that seem to be particularly relevant and pertinent to the subject matter at hand.

Open curricula especially put an emphasis on “character skills” such **perseverance**, **curiosity** and **sociability**, which are highly valued among employers (see recent ILO and World Bank studies) and **which correlate to a very high degree with a trainee’s ability to adapt to new situations and to acquire new skills**. Behind that concept stands a recent insight from learning theory and educational psychology, namely that what is **typically described as character is a bundle of skills, NOT a trait**, and schemes that teach these skills both have a lasting effect and are a very good investment in a country’s human capital.

Finally, such an open curriculum promotes “deep learning” and supports teaching methods that do not stifle understanding. Work tasks rarely ever expect exactly the same, and do change tremendously over the years. So what is needed are competencies of **problem-solving** and **critical thinking**, at least to a certain degree. **Teaching methods** such as project work, case studies, experiments, self-directed but supported theory learning and working in teams further and bring about such skills. Technical skills should be **embedded in work-based situations** that need to be performed, containing some problems as well, be it in a workshop or modeled in some way.

Open curricula allow for such pathways to acquire knowledge and skills, supported and guided by competent teachers. Teachers must be schooled as to how **to apply open curricula** in their training centers and how to turn them into **individual training and lesson plans**.

(c) Syllabus:

The term is commonly used as a synonym to curriculum among teachers and administrators alike. However, it is meaningful to draw a distinction, as syllabi are supposedly more detailed than curricula, contain more specific teaching hints and adapt general competency-based stipulations to local (business and private life) circumstances as well as highlight focal points and specific gifts of institutions and staff.

Therefore, it makes sense to come up with more specific syllabi for each TVET-institute, elaborating curricula locally as a team product of academic staff teaching in one course or subject. Then teachers make use of local syllabi to design individual and everyday planning tools, e. g. lesson and training plans.

Syllabi are the link between state-ordained curricula and individual lesson plans on the institutional and local level, constituting a major component of quality in TVET for each institute.

QTA Key Insight No. 20:

To clarify key terms in use, a **syllabus shall be the instrument in use to interpret and augment official curricula for usage in specific local and institutional situations**. That means syllabi set the tone for teaching and learning in a particular TVET institute or head office, implementing a pedagogic focus (such as project-based learning) and mission statements in **internally binding institute-wide syllabi**. The even more concrete planning level is the individual instrument of lesson and training plans, further elaborating syllabi.

Each high quality TVET institute works out in-house syllabi for all teaching sessions going on internally.

(d) Lesson Plan:

Lesson plans are individual instruments to visualize a teacher's planning. They have to heed the parameters of official curricula and institutional syllabi alike, but contain a substantial degree of pedagogical latitude. They outline the specific methods of teaching, media, locations, learning products and assessment methods as well as timing, fine-tuned to a group of learners and an individual teacher for a certain lesson. Lesson plans take needs and special backgrounds of learners as well as strengths and weaknesses of teachers into account (see concrete examples in section 3.2).

Usually, they are formatted as clearly laid-out tables (or more technically: matrix or grid pattern), but that is not a must. The individual teacher decides what suits best. For some, to wrap the planning purely in words and continuing text might do as well.

(e) Training Plan:

A training plan is essentially a synonym for the term lesson plan. Therefore, it should have the same intention of planning a session of teaching individually and use the same format. However, some institutes use the term for long-term planning instruments.

Generally, the different name stems from the fact that it mainly derives from the planning of practicals, workshop sessions or demonstrations in TVET, and that the trainees involved generally undergo a phase of training in a training center, as part of an apprenticeship scheme or an on-the-job training phase. As long as the training involves a trainer that plans some formal phase of tuition, the rules of a lesson plan apply as well.

The concept of a **scheme of training** as another term is also in use, and is synonymous with training plan. It strongly indicates that the teaching takes place in workshop, repair shop or garage. Schemes of training often contain aspects such as consumables and machines needed as well as work tasks to be carried out. Generally speaking, any lesson plan layout can also be used to design a scheme of training. It is noteworthy to point out that in some countries, for example in New Zealand, a scheme of training can also be course-like in meaning, leading up to an award, but not yet to a qualification.

If a training plan describes the planning of work sessions in different departments in a company, then we speak of a **training scheme** or a **training sequence**, not a training plan in the sense described above.

Sometimes the different terms in use are confusing and obfuscate TVET. That is why the following visualization is designed to make involved actors comprehend the different concepts used in TVET for planning and steering the sectors:

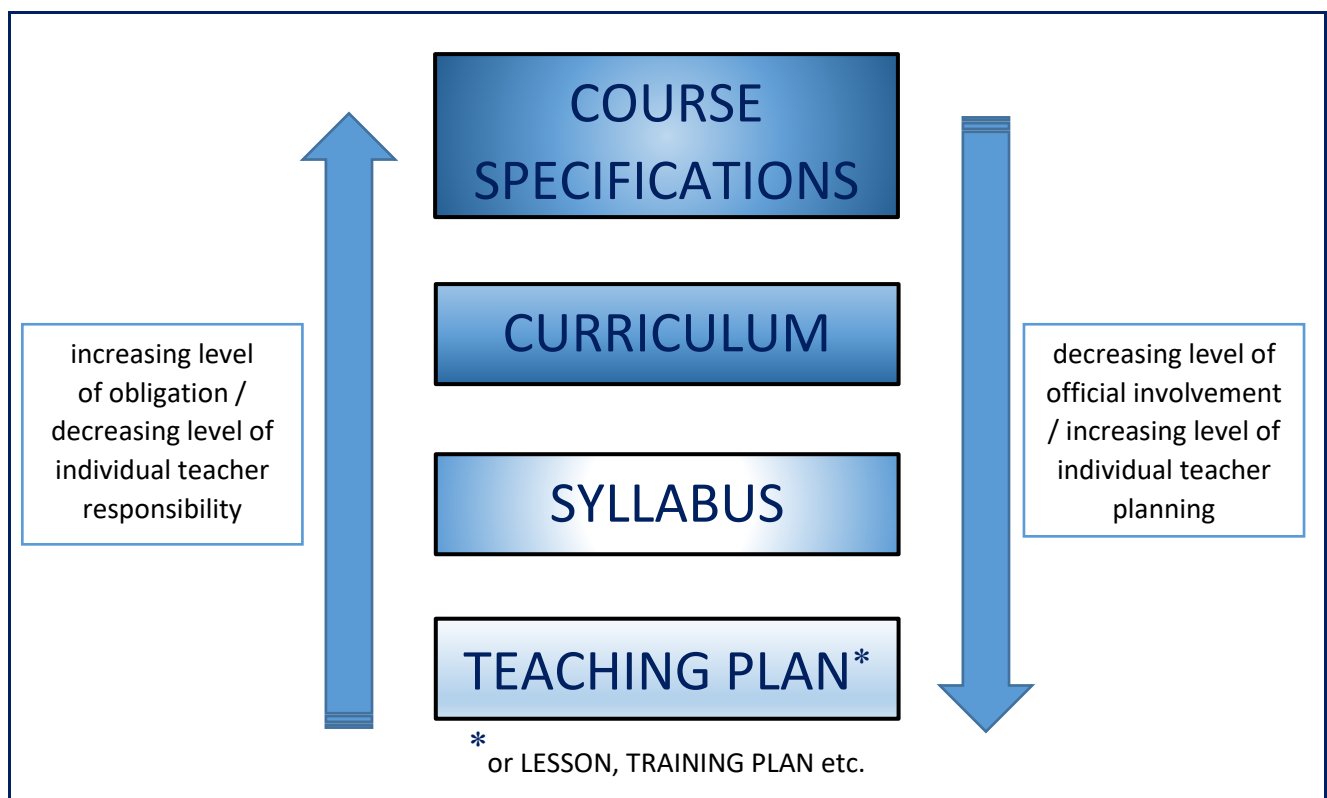


Figure 7: Concepts in use in TVET for planning and steering the sector

Pragmatic QTA Hint:

To facilitate things further, any individual plan elaborating curricula and syllabi may be called **teaching plan**, comprising the terms lesson, training plans, schemes of training etc. as an umbrella term.

Chapter 4: Competence-based assessment

4.1 Basics of competence-based assessment

According to international standards and prevailing views in education, assessment is considered a judgment being made by expert assessors with regard to the level of competence, laid bare by knowledge, abilities, skills and attitudes that are, as an inseparable conglomerate, proven to exist in real-life work situations.

At this point, it is of paramount importance to underscore that

- knowledge,
- abilities/skills and
- situational application

are the **three main components of competence-based assessment (CBA)**, to be measured as a bundle.

CBA is carried out in order to award qualifications at the end of training courses, e.g. National Vocational Qualifications (NVQs) in many parts of the English-speaking world, at a certain level of competence.

Levels of competence are generally codified in **competency standards** and/or **curricula** which feature all identified competencies needed in certain occupational fields or trades at a certain level.

Assessment plays a crucial role in competence development within a TVET framework and, ultimately, in certifying an achieved level of competence for potential employers and individual career planning. As assessment can be supportive in nature and foster learning aside from ascertaining a status quo, it can be applied in a multi-faceted ways—well integrated in the teaching-learning process.

4.2 Types of assessment

As a general rule, competencies are assessed with the following objectives:

- a. **Formative assessment:**³
This kind of assessment provides regular feedback to learners as regards the current state of their competence development. Ideally, it is applied continuously and deeply engrained in the process of learning. Teachers give regular feedback and counsel students on their development process during their course.
- b. **Summative assessment:**
Summative stands for “ending” or “winding up”, which means checking the accumulative acquisition of competencies needed in a certain trade, for example. This type of assessment is utilized to grade a certain module or more generally, part of a course--or in the end to certify qualifications at the very end of a course in TVET for the labor market.

³ The term “**continuous assessment**” is used synonymously.

Summative assessment is also used to certify experiences acquired on the job, i. e. by experiential learning and on-the-job work practice. This assessment is done via so-called **Recognition of Prior Learning (RPL)**. The difference to traditional assessment is that RPL assessments check for the existence of competencies acquired through **informal learning at the workplace** at a given point in time at some official RPL assessment location—instead of following formal learning set-up in center-based or apprenticeship-based courses and being assessed in the end.

4.3 General principles of assessment

4.3.1 Competence-based assessment (CBA) in general terms

These days, all reputable assessments carried out in TVET systems are to be competence-based. Assessments are only relevant for the workplace if they take stock of prevalent knowledge, abilities and skills which are proven in work-based situations.

Consequently, competence-based assessments rely on checking the capability of performing tasks in simulated or real job-like situations which relevant to the bundle of competencies codified in expected and official standards laid down by national bodies (curricula and competency standards). Such assessments must be carried out highly professionally and according to assessment quality standards.

4.3.2 Criterion-based assessment

All competence-based assessments rest on criteria that consist of **minimum competency standards** required in a certain job. These minimum standards or minimum manifestations of competence equip a trainee, just about, to perform certain work tasks successfully.

Therefore, a minimum standard is a level of competence at which a person can work in real life at a satisfactory level, but not more. In order to measure any performance beyond the minimum standard, a separation into “competent” or “not yet competent” is not sufficient, and a more sophisticated multi-point grading scale has to be introduced.

The competence level of fellow trainees does not matter in this type of assessment—and any student ranking, as in norm-referenced assessment, as the opposite of criterion-based assessment, is not intended.

QTA Key Insight No. 21:

Competence-based assessment is always criterion-referenced, that means **assessors look at a minimum competence standard as a benchmark** that needs to be achieved in order to be considered competent for the job market, at least to a minimum degree.

If norm-referencing a performance to peers, i. e. comparing levels of competencies with other assesses, is asked for, the level of “being competent” is to be made dependent on the level of competence reached by other trainees. That is why **norm-referencing is not a proper method in true competence-based assessment**, since occupational standards set the relevant point of reference, not the performance of peers.

4.3.3 Evidence-based assessment

Competence-based assessment relies on evidence and uses multiple sources of evidence to certify competence standards. Evidence should be collected in a comprehensive **student’s learning portfolio** for assessment purposes (see Chapter 8 for details). This is to base a final *viva voce* on evidence collections for competence proven. It is better still to conduct verbal “*portfolio defense*” (a so-called **colloquium**), instead of a *viva voce*, i. e. a “hearing” before an examination committee that asks challenging work-related questions based on portfolio entries.

Evidence provided for competence-based assessment, to be collected in learning portfolios, can come in the following forms:

- Trainees’/Student’s record books, journals or log books
- Written Test and examination results
- Model creations worked out by the candidate or collections of work samples
- Pictures/Images of late work products / samples
- Testimonials stemming from work supervisors / industry trainers
- Peer reports and trainer reports
- Feedback from customers or fellow group members
- Evidence of successful completion of prior training courses (certificates)
- Verified work experience / external testimonials
- (Video)tapes of performed work processes
- Project reports or finished assignment reports
- Role play scripts or role play tapes
- other varied and innovative evidence (e. g. podcasts of customer talks, interactive whiteboard presentation etc.) provided about relevant experience or job-related actions

Figure 8: Potential Evidence for CBA

It makes sense for teachers to screen their trainees' portfolios on a regular basis and provide formative feedback to help improve the evidence base and to foster observable competence developments.

Teachers' formative judgments should be recorded in a **Trainees' Progress Record Booklet**, as part of a reflective learning portfolio. Finally, teachers and external assessors of qualifications alike inspect learner portfolios in detail and come up with a summative assessment that determines a certain category of level of competence reached, based on all evidence provided and the defense of the evidence in the colloquium.

Any assessor can always ask for further evidence during the colloquium or subsequently during the process of certification, if not convinced by the conclusiveness of the evidence provided or if the authenticity of the evidence cannot be verified.

Further evidence asked for may typically be, for example:

- a second portfolio-based colloquium (with regard to job functions / competencies)
- a case-study
- a practical work task to be performed at the spot
- an authentic workplace observation
- a simulation of a situation involving customers and or superiors
- a role play.

For reasons of assessment practicability, assessors are advised to develop and maintain a "question bank", i. e. a database for written (and verbal) competence-based question items, covering all occupational fields of assessment addressed by the assessor. In any case, it is much more efficient if the job of establishing an assessment item database is being outsourced, e. g. to a specified institution, a head office or even some nation-wide regulatory body. This secure database is to be digitized these days and accessible anytime from anywhere for authorized assessors!

Pragmatic QTA Hint:

In TEVT, teachers should **make use of and contribute to institute-wide and nation-wide databases for specific assessment questions** and instruments that have proven their worth.

4.3.4 Potential categories of competence achievement

Teachers and external assessors alike are usually asked to group individuals' assessments into categories in order to provide meaningful feedback to students as a formative endeavor during the course of competence development and to employers and students as a final report with regard to the aggregate level of competence achieved at a certain point in time:

When reaching the competence category “passed”, a student will be certified with an aspired qualification, i. e. the assessee will be rated “sufficiently competent”. Only the verdict “failed” means “not yet competent”, i. e. the certificate, diploma etc. will not be awarded at the time of assessment.

Even more sophisticated assessment scales, e. g. used in written tests, can and should be incorporated into scales that determines competence categories.

Otherwise, what does 57 % competent mean?

Transferring percentages or points into **competence categories** can be achieved via a “transfer scheme”, such as the following example:

• 0 - 40 points: not yet competent
• 41 - 55 points: sufficiently competent
• 56 - 65 points: competent
• 66 - 75 points: very competent
• above: extraordinarily competent.

To highlight the classification used above, exemplary categories of competence can be formed such as given below:

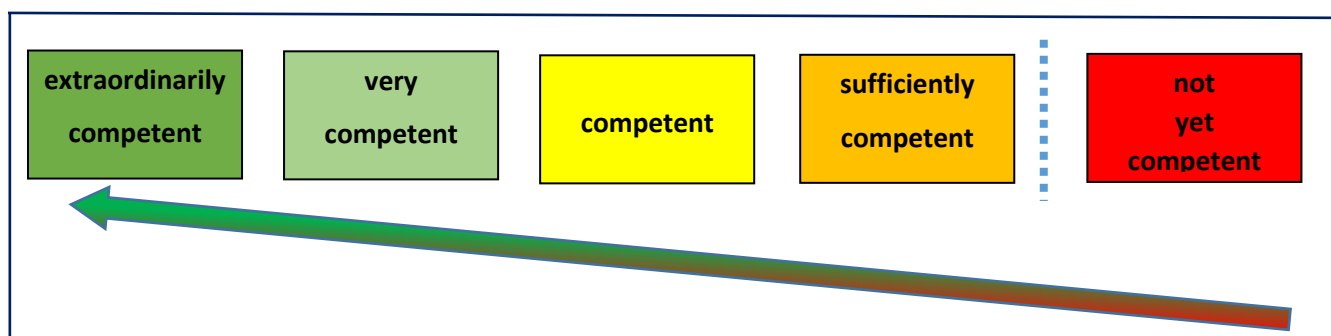


Figure 9: Potential categories of competence development

As a matter of consequence, in written tests and other means of assessment that use more sophisticated scales, a **minimum pass mark** for the category “sufficiently competent”, such as the 40 % in the scheme above, is to be established.

As part of a consistently ongoing formative assessment, work tasks will not have to be repeatedly presented, as long as the teacher judges the performance of individuals as “sufficiently competent” during training courses.

However, in order to support learning and getting better, the teacher will have to provide written accounts with regard to the exact category into which a trainee’s performance has fallen and counsel learners with respect to options how to improve in due course.

4.3.5 Quality criteria of TVET assessments

Generally speaking, all competence-based assessments should follow internally recognized quality in education and TVET (cf. Darling-Hammond et al. 2013):

- **Validity:** the relevant competencies needed in a certain occupation or sector (as specified in competence standards or curricula) are truly assessed—and no others
- **Reliability:** assessments are repeatable with a high degree of accuracy, i. e. assessments are independent of time and location or individual assessors
- **Objectivity and Fairness:** with a change of assessor the same result will occur and all candidates are assessed according to the same norm (no bias), i. e. no unnecessary evidence demand or different standards applied
- **Transparency:** expected performance levels shall be laid bare and standards must be accessible (e. g. an evidence matrix based on competency standards).
- **Economy:** assessments are not too costly and do not impose an exorbitantly high correction time burden on assessors.

Moreover, **high quality of assessors must be ascertained** in any TVET system, commonly by a government regulatory body and training providers in coordination, mostly by means of giving feedback and providing further training for assessors. Appointed assessors for any qualification to be assessed externally should be released from duty at the end of TVET courses for an entire week and up to two days a week per month during ongoing courses. The same should apply, if possible, for assessors from the private sector as well.

Complaints from parties to assessments should always be possible and handled with due respect, sincerity and conscientiously by some mediating TVET authority, usually the regulatory body, e. g. by installing an ombudsperson, and provide feedback.

4.4 Conditions of state-of-the art competence-based assessment

Up-to-date competence-based assessment in TVET mainly means adhering to two presuppositions:

- (1) **Assessing for all components** of the concept of competence
- (2) **Assessing in the same mode** as teaching and learning unfolded in class or in the workshop.

Taking these two assumptions at face value, any testing asking for pure knowledge or any simulation of work, if that has not been practiced during training before, is ruled out.

Recently, it has become a trend to rate performance according to the two labels

- “competent” (c)
- or
- “not yet competent” (nyc)

only, inferring that a certain performance proves a sufficient level of competence to perform given work tasks. Such an approach of a two-pole rating scale is generally considered as standardized competence-based assessment.

But as a matter of fact, such an **approach is oversimplified**, as competencies unfold along a continuum from being a total novice, not able to perform any task, up to a highly skilled and flawless top professional, performing fast and brilliantly (see potential categories of competence in Chapter 6.3.4.). Accordingly, a typical scale to evaluate a certain competency should rather look like this:⁴

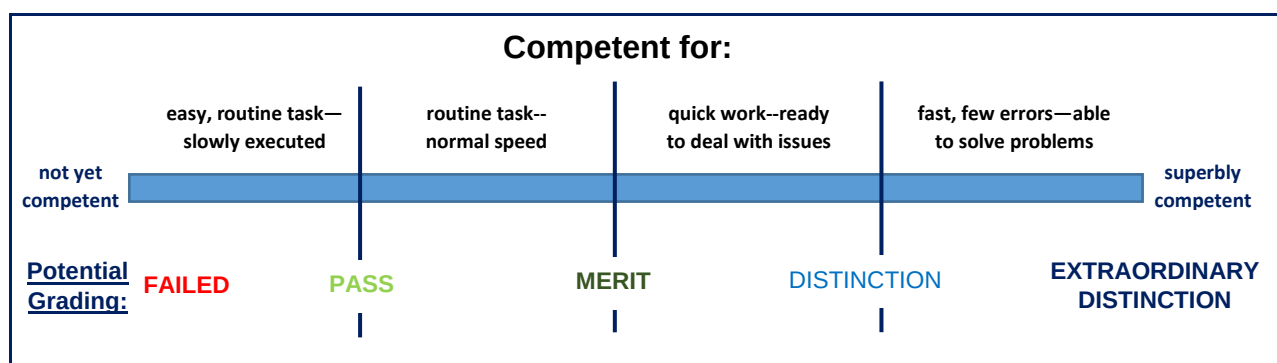


Figure 10: Assessment continuum for parameter values of competencies

A certain specification on the continuum in the figure given above for an individual can be observed in everyday work, or in an assessment situation for that matter. The judgment can be placed somewhere along the continual line so that competencies in any area can be rated, based on observable behavior or evidence provided.

For a matter of practicality, such a competency continuum has to be subdivided into categories, as illustrated above. That is to place the performance at certain work tasks into a category, into to allow school-based certifications along the lines of the generic system as such *fail*, *pass*, *merit*, *distinction*, *extraordinary distinction*, which amounts to a categorical grading system. Of course, any cut-off line between two categories is somewhat arbitrary so that an assessment tool used has to be transparent and to foster fairness the performance criteria for the placement into categories must be open to assessees.

⁴ However, it has to be mentioned that some TVET experts consider a grading system at the initial certification at craft level as too complex, and that it should be left to the respective trade bodies during the course of a career with increasing levels of competence due to work experience.

At that point, it is recommended to especially make use of the assessment tool of **competence rubrics** that is perfectly suited for the purpose of **categorizing assessees** according to their assessment performance (see chapter 8.4 for details on rubrics).

Any grading system which allows for jotting down only a mark for “c” or “nyc” is a gross simplification and a **mistreatment of the complex concept of competence**. Moreover, any future employer is bound to obtain a very limited message through such an assessment of competencies, knowing full well that every staff classified as purely “competent” can vary widely with respect to true abilities to cope with everyday work challenges and even routine tasks.

QTA Key Insight No. 22:

In TVET, the classification of trainees as being “competent” or “not yet competent” is not suitable for the purpose of improvement of staff selection, neither in formative assessment (feedback is unclear as to how to improve for students) nor in summative assessment (measurement is unclear regarding how competent a student truly is at a given point in time) situations. Therefore, a **system of competence categories should be applied** in any assessment, with each category describing a state of competence reached (see competence rubrics in chapter 8.4 for a good example).

Part B: Concretization of How to Teach and Assess Well

Chapter 5: Conceptualizing teaching and learning in TVET

5.1 The suitable overall approach to teaching and learning in TVET

Insight No. 23:

Teaching methodology in TVET, considered most efficient and effective, **has been changing with the winds of pedagogy**, every two decades or so.

The reason for that is that the perception of the proper approach of how to teach and learn well in TVET has changed tremendously over time, depending on new insights into the psychology of learning, supplemented by cognitive and brain research these days.

When looking at the history of pedagogical temporary fads and trends in teaching and learning, it has to be borne in mind that more recently the science of how to study and teach well has turned into a more fact-based arena, as findings in the neuro sciences and enhanced competence measurements have added hard facts to the pedagogical discernment of what works best.

Nonetheless, let us have a look into the pedagogical trends that have been predominant in TVET for a long time, to understand teaching habits that still determine the reality in many TVET institutes, classrooms and workshops:

Unsurprisingly, in colonial times there was a heavy focus on discipline and order, mirroring the world view of a reigning class and a serving majority that had to perform menial work and all blue-collar jobs. As a consequence, it was shown to apprentices and trainees what to do in formal settings or very informally by some master in a company workshop. The apprentices and trainees had to imitate the models as closely and precisely as possible; no independent thinking and no creativity was required. Employees were meant to obey.

That went along with the pedagogical and philosophical concept of **Behaviorism**, which believed in the possibility to steer human behavior by providing certain stimuli and triggering as well as training asked for responses. That worked up to a degree, in a static world order with little change in required job skills and a submissive workforce in non-democratic regimes.

In the waning days of colonialism after World War II, something stirred in TVET pedagogy as well. Newish concepts such as John Dewey's Pragmatism and Georg Kerschensteiner's *Arbeitsschule* (industrial school) took hold, which propagated self-organized and self-regulated learning as well as project-based and on-the-job teaching and learning (Martin 2003 and Roehrs 2000).

Some of these ideas were integrated in TVET programs, especially by entrenching dual training set-ups in the Germanic world and by exploring job-based and project-based training.

Nonetheless, the prevalent concept of teaching was teacher-centered “preaching from the pulpit” in TVET, i. e. telling learners what and how to do it. In workshops, at least, imitation of live human models, that is the workshop trainers and demonstrators, was still the concept of the day.

That all gradually changed only with the introduction of **cognitivism**, which demanded more conscious understanding of tasks and work to do and therefore required fundamental background knowledge in depth. Even though the realization that understanding theoretical principles underlying work processes and handling of affairs is very important, flaring-up criticism of a purely cognitive approach laid bare that so-called **inert knowledge**, even in greater dimensions, does not necessarily help in TVET.

Inert knowledge means that a worker may know a lot, but might not be able to apply that knowledge to work tasks at hand. That is a problem that was pointed out as early as 1929 by Alfred North Whitehead (Whitehead 1929) as the major obstacle of the pure cognitivist approach, giving rise to the concept of useless inert knowledge following cognitivist teaching.

The existence of **inert knowledge** was furthered even more along the lines of academic teaching, being ever more teacher-centered and dumped on students. Teaching professionals felt this teacher-centered method was justified by the cognitive approach and by “making students learn”. That went along with so-called **programmed instruction**, which focuses on strictly formulated and knowledge-based learning objectives. Whether or not these objectives are met can be ticked, simply by having taught them and making students sit tests, which mostly require learners to reproduce knowledge that was learnt by heart, i. e. **making rote learning a preferred mode of learning**--instead of lateral or creative thinking, which are required in the labor market these days. Therefore, such an approach is **particularly devastating in TVET**, as students are not ready for the job after training, and may possess quite a litany of subject knowledge that is not applicable, in other words and “pedagogy-speak”:

the technical knowledge is **inert and isolated**, not usable in everyday work life!

As a consequence, companies complain, to these days, that TVET graduates do not have the skills needed and must be re-trained on the job--what a waste of time and public money. As this phenomenon is still present these days, with the private sector complaining about a TVET system that is not churning out competent graduates for the workplace, **teaching must change**.

Behind that is that the TVET sector still makes students sit knowledge tests. What for?

Why are students not asked to **solve case studies and real-life work situations**, in which they prove that they are able to apply knowledge, skills and abilities in solving everyday work tasks and problems?

Answering that question pedagogically, one can look at the dawn of **pedagogical constructivism** for “salvation”, even if most ideas of that new teaching paradigm are eclectic in nature, i. e. the ideas have been around for a while, but without a coherent learning theory to back it up:

- emphasizing a teaching-learning process with the **student at its center**,
- continuously **activating students** in the classroom by utilizing work-related tasks and real-life problems,
- bringing the **training of soft skills** onto the agenda and integrating it into everyday teaching and, ultimately,
- focusing the **learning process on competencies** needed in life and at work.

The so-called **constructivist approach** has been all the rage since the 1990s. It has amalgamated best-practice from older days, incorporating “methods that work” from behaviorist and cognitivist TVET teaching, such as **demonstrating and fading** of demonstrators and instructors or **example-based teaching**, but adding a reflective component to it.

The outcome was a repertoire of learning and teaching methods that reigns supreme in TVET these days (see Boehner 2015), as methodological tools to facilitate the acquisition of competence needed in work life. As matter of fact, the competencies learned are to an overwhelming degree the ones that are needed in private life too, turning the trainee into a responsible and worthy holistic human being or citizen simultaneously.

Insight No. 24:

These days a **moderate constructivist approach to learning and teaching in TVET** seems to reflect the findings of neuro science and sophisticated international competence studies best. That means the teacher is present, but commands a comprehensive repertoire of student-activating and student-engaging methods, to be applied continuously and in alternation.

Pure theory teaching in lectures are proven to be **most inefficient**, so teachers are strongly advised to refrain from that approach!

Teacher-centered lectures have not disappeared completely, but they are supposed to get rare, if TVET learning shall be efficient.

Lectures are justified to lay the groundwork in case there is no prior knowledge available at all, i. e. making **self-exploratory learning**, propagated as the natural mode of learning very early on by the influential psychologist Jerome Bruner (1966), impossible. Instead, the teacher can provide anchors for future active learning to be rooted in the so-called **expository learning** according to the equally important American psychologist David Ausubel (Ausubel, Novak & Hanesian 1978). Such **neuronal anchors** consist of identified key concepts of certain subjects, trades or occupational fields. An important component of Ausubel's concept is that teachers prepare so-called **Advance Organizers** (AO) to visualize these anchors.

These are handouts that give the gist of the topic, state the identified key concepts in some meaningful order and perhaps give definition. AOs may also provide a basic concept map or network of technical terms, for example, by means of a mind map:

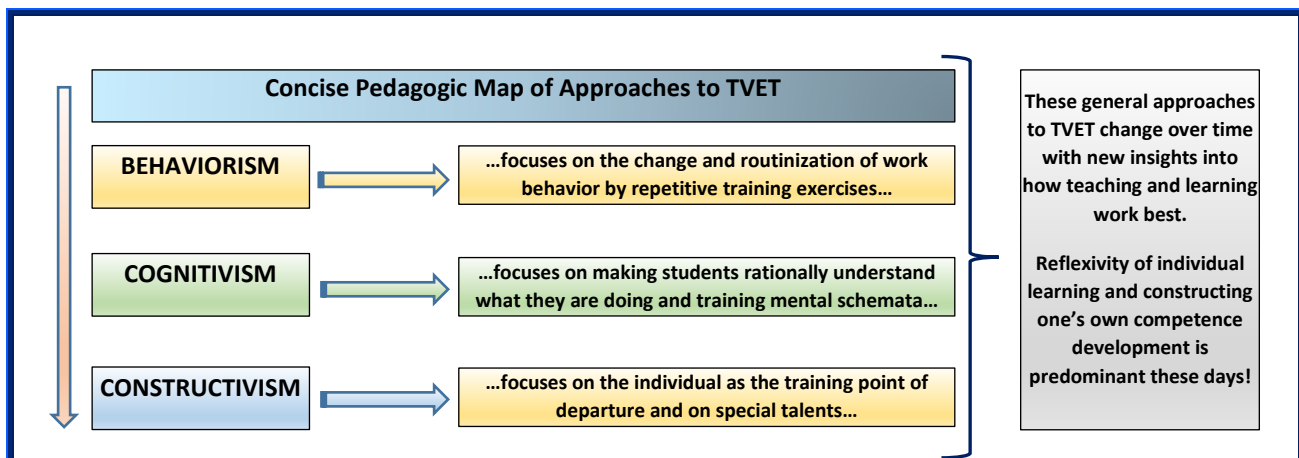


Figure 11: Simple example of an Advance Organizer (AO)

Pragmatic QTA Hint:

For instructions **how to draft appropriate Advance Organizers** for teaching purposes, see Chen 2014. They make for a great start for self-exploratory learning, as the technical field to explore has already been sketched out in terms of conceptual neuronal anchors that allow to build new learning upon.

That said, **lectures should still never last long**. Neuroscience has provided evidence that the ordinary human being cannot concentrate for much more than 20 minutes during receptive learning phases. That means such input sessions should be **short, sharp and precise**, constituting the **SSP rule for lectures**. Sharp in SSP means making use of elaborate rhetoric devices, proper and smart metaphors as well as

language perceived as proper and elegant, while precise stands for coming to the point without “beating around the bush”, i. e. babbling away about fringe topics.

Even if following the SSP rule, the audience should be involved **by asking teacher questions, allowing student questions to be asked and activating potential prior knowledge on the student’s side**. That goes as far as letting a student do the explaining if there is one very advanced student possessing extensive prior experience and knowledge.

That approach is called “**Learning via Student-Teaching**”, which may make the subject at hand way more interesting for peers.

Finally, any TVET teacher is well advised to adhere to the following almost banal principle for the message of lectures in TVET:

KISS = “Keep It Short & Simple”,

The aspect “Short” in the acronyms SSP and KISS mean **no longer than 20 minutes**, better is 10 to 15 minutes, as TVET students are mostly even less inclined to respond to formal lecturing—they opted for practical training, this is a fact to be remember at all times.

The aspect “Simple” in KISS means that any theory and knowledge background should not be presented in some academic, research-minded style, but as **the foundation of practical work**. TVET students are not trained to become researchers but practitioners. One example would be to prove a mathematical equation (academic) versus making use of the equation to calculate, for instance, resistance in an electrical system.

Having realized that lectures can only be used sparsely in TVET, the attention should turn to the multitude of alternatives that are available for well-designed teaching in TVET.

Before we do so, let us summarize how 21st-century learning and teaching in TVET should be organized, following the identified moderate constructivist approach:

- (1) A TVET teacher is well prepared, i. e. having a **professional lesson or training plan** at hand, based on a topical and **well-designed open curriculum**. That open curriculum should leave some leeway to professional TVET teachers when it comes to the design of practicals and lessons.
- (2) The teaching process (delivery) should be designed following **modern student-activating methodology**, always involving a high degree of self-regulation and self-organization.
- (3) At the end of each teaching process there must be a **reflection phase**, to make students aware of learning effects, let newly learned aspects sink in and provide for **sustainable competence development**.

- (4) All learning and teaching must be competence-based, i. e. involving a technical **knowledge** component, an **ability or skill** that is to be shown and applied in a **work-based real-world or simulated situation**. **These three components must be part of any teaching process in TVET simultaneously**. It is not suitable to train knowledge or skills or discussing work-life demands separately.
- (5) Finally, TVET students need to be **counseled consistently**, i. e. **assessed on a formative basis**. The **final assessment** (summative) must mirror the teaching style before, which means it has to be **based on competencies acquired** that are to be shown and proven in a similar way, e. g. learned and assessed by the case-study method. There are several assessment methods that support this approach and others that should be abandoned completely.

Pragmatic QTA Hint:

Why is it crucial to understand the theoretical backdrop of TVET for everyday teaching and learning?

Because any teacher needs to comprehend how their students learn best, and how they are bent on learning!

For that reason, moderate constructivist theory offers insightful explanations that oblige to model teaching sessions on these findings (cf. Marlowe & Page 2005 or Eberwein 2016):

- (1) TVET students only learn if they perceive any practical relevance.
- (2) TVET students delete knowledge that is not learned alongside an ability or skill by practical doing in a real-life or simulated context—or the knowledge cannot be made use of during application.
- (3) To create curiosity and excitement as well as to stimulate motivation enables long-lasting memories and learning achievements.
- (4) The learning brain of young adults is hard-wired to connect to former learning experiences and existing experiences—they need to be made use of during learning sessions by allowing for individual learning speed and intake of study matter, i. e. asking for student-centered and student-driven learning methodology.
- (5) Students create their own learning reality by connecting to other human beings socially and by setting own goals. Granting students the latitude to explore and grow in TVET means allowing them to acquire technical hard as well as soft skills along the way.
- (6) Learning only takes root by backpedaling for a while, and deeply reflecting on the learning experiences and competence acquisition.

That is how TVET learning should be organized. Teachers, adapt teaching and learning sessions accordingly!

5.2 A modern concept of teaching and learning in TVET

Having established that a **moderate constructivist view of pedagogy**, teachers must also adopt a constructivist approach to teaching and learning in TVET that is appropriate to meet ever-changing demands of labor markets and to accommodate the latest findings in pedagogical and learning research. In this light, constructivist over-arching principles of teaching that underpin everyday delivery in TVET institutes loom large.

Unfortunately, teaching and learning in TVET has always been excessively complex because there are many different trades and occupations in diverse sectors of the economy as well as positions to be trained for at different steps of the hierarchy ladder, asking for widely differing levels of knowledge, abilities, skills and attitudes.

Therefore, no simple set of principles of teaching will do, and fitting principles shall be derived from the following line of reasoning:

Since the advent of the Internet and technological progress at a tearing pace, disrupting work usances and life habits tremendously--just look at formerly unthinkable instantaneous messaging and picture exchange, or long-distance handheld videoconferencing--, **competencies taught in TVET and teaching methodology itself have the potential to be altered entirely as well** (see the following section 5.3 on “The Flipped Classroom” in this Chapter).

In our days, next to all technical competencies that are still required to be taught, no doubt, there are good reasons to **dedicate 50 % of contact hours to a newish competence** in the context of lifelong learning: **“the ability to adapt”** (for details see Boehner 2017). The necessity and overriding importance of lifelong learning and the unavoidable adaptability that goes along with learning an entire life has been emphasized and accentuated lately by the private sector, industry and business bodies as well as academia.⁵

This concept of adaptability comprises an entire set of competencies, usually discussed under the heading of “soft skills” which commonly contain a mixed set of communicative, problem-solving and creative skills as well as the abilities of flexibility and reflexivity. Altogether competencies in such varied fields make up the **multi-faceted construct of the key competence “adaptability”**, a necessity to survive in the modern world of work.

⁵ See the special edition of “The Economist” on lifelong learning and lifelong education, No. 9023, 2017

QTA Key Insight No. 25:

In addition to technical competencies, as codified in competency standards and curricula, a key competence to survive in the modern world of work has to be taught consistently and shall involve about half (50 %) of the teaching time available: **the key competence of adaptability**, comprising several other concepts generally discussed as soft skills.

To consistently teach clerical, technical and vocational competencies alongside aspects of adaptability, it has to become an **imperative to change the entire concept of teaching and learning in TVET**. A complete rethinking of how to structure workshops and lessons has to sink in, leaving traditional set-ups of teaching hopelessly redundant and inadequate for modern challenges.

The general approach to teaching has to be

- **student-centered**
and
- **action-driven,**

as two counter-concepts to vintage receptive learning, as materializing in traditional illustrated talks or teacher-centered pure demonstrations. That sounds like often repeated empty phrases, but that is not the case. In contrast, **these two general approaches to TVET boil down to five more concrete pedagogical principles** elaborated below.

As TVET has to train for the challenges of work life and to equip students with competencies to cope with work requirements, teaching has to live up to that challenge appropriately. **It is the noble task of TVET to prepare each new generation for work life**, many times opening up a rewarding career path for a large part of the population and catering to disadvantaged and in many regions of the world poor youth as well.

In order to prepare them adequately and provide the labor market with readily absorbable personnel, which is in the best interest of any country, TVET is left with no choice but following **pedagogic principles that embody modern and 21st century-app styles of learning and teaching**, if applied correctly. For “correct application”, some exemplary methods to be utilized under the superscription of these principles are the subject of the next chapter.

The five identified over-arching principles of teaching and learning substantiate the general ideas of student-centered and action-centered pedagogy in TVET:

(1) In-depth Learning
(2) Exemplary Learning
(3) Experiential Learning
(4) Problem-Based Learning

And all four principles are consistently to be flanked by a fifth principle of successful and sustainable teaching in TVET:

(5) Reflective Learning.

As these five essential pedagogical principles of TVET have a major bearing on the methodology of teaching and learning, they will be explained in the following section.

5.3 Five essential principles of teaching and learning in TVET

5.3.1 Pedagogical Principle 1: In-depth Learning (IDL)

The pedagogic principle of “in-depth learning” (IDL) has the potential to ferment **a new culture of learning in TVET** (cf. Egan 2011). Basically, it propounds, well beyond the idea of learning by using examples, to become as much an expert as anybody on earth in some small area of an occupation, say regarding a *catalytic converter* in the automotive trade or *adapter kits* in the electrical trade. To apply IDL, learners have to find out what you can do with that equipment, including all potential usages, when invented and how, what material they are made of and all alternatives, check the prices from different suppliers and in different countries, explain the usage to potential customers and colleagues, fantasize about applications in very different areas and introduce laymen to the equipment in simulated roadshows.

Pragmatic QTA Hint:

“In-depth Learning” is not to be confused with “Deep Learning”, the former referring to human learners going into detail, doing research, checking and trying out over a long period of time, while the latter refers to computer learning, usually imitating or taking inspiration from the functioning of neuronal networks and wiring of human beings (Goodfellow, Bengio & Courville 2017).

The idea behind IDL runs as follows:

- **Step 1:** Introduce a small-scale and specific topic to each student in a new batch right from the start. The selected topics must be covered by the curriculum and be of practical relevance.
- **Step 2:** The teacher turns that into a student long-term assignment, making room during contact hours for feedback loops to the others and designing interesting performances (such as experiments, role plays or freeze frame, product shows, videos, demonstrations etc.). The assignment could look like this:

“Study your topic throughout your course, at least 30 minutes every day and when you are asked to in class, and get back to it consistently. Periodically, there will be presentations, experiments, demonstrations, product exhibitions, role plays that you design on your own, concerning your topic.

You will also document and reflect your development into an expert—and what research you have done on your topic in a so-called “topic portfolio”. That paper is to be handed in at the end of the course for grading. You shall become **one of the foremost**

professional experts on earth with regard to your topic. 👍

Enjoy!” 😊

- **Step 3:** Recurring timeslots in the overall teaching process for students to report on their findings and innovatively mold short presentations to entertain and create interest amongst fellow learners regarding their topics
- **Step 4:** At the end of course, there will be a final presentation--maybe even inviting parents, companies and the wider school community
- **Step 5:** Handing-in of “topic development portfolio”
- **Step 6:** Grading of presentation and portfolio plus face-to-face feedback.

Obviously, the pedagogical purpose behind IDL is to overcome the limitations of **superficial learning**, which takes place far too often in TVET, as teachers slavishly cling to curricula or even more detailed institutional syllabi. Indeed, that has the laudable

intention to cover everything a student needs at work, identified by professional that came up with the curriculum. But in fact, **such an approach frequently leads to insufficient time being dedicated to develop specific and highly relevant competencies, and to numerous superficial competencies**, i. e. skills that may not be deep-rooted and “unlearned” again quickly. That means students may be able to imitate demonstrations or very specific handcraft movements in class in the short run, but do not see through the actual necessities or the bigger picture—and simply unlearn again.

Consequently, teachers must make use of their “pedagogical leeway” for shaping their teaching sessions and include IDL in their individual teaching plans, **focusing minds on in-depth insights and resisting the drive to completeness**, when the outcome is usually superficially qualified students.

Of course, curriculum contents are binding, so parts of it may be left out and directed towards **homework-based assignments** or even negotiated to be **covered during phases of industrial training or internships**. For that purpose, a close cooperation with companies seems a very important prerequisite.

Moreover, a teacher can regularly support IDL by interviewing students about their progress regarding their topic, e. g. during group-work phases in class. Teachers may also encourage portfolio writing, drop hints about what innovative presentation to do next time or what new webpage to consult etc. (for further tools how to support IDL, see Silver, Strong & Perini 2001).

IDL should be made a regular feature of teaching in TVET to equip students with the abilities they need in life, i. e. fostering important soft skills such **as lifelong learning skills and perseverance** as well as the **technical skills to develop true expertise** in a special realm.

5.3.2 Exemplary Learning (EL)

First of all, the term “exemplary” is easily misunderstood. In exemplary learning (EL) it does not mean any behavior “worth of imitation” or “commendable”, but instead refers to teaching sessions that are **based on real-life examples**, serving as a model and an illustration of possible situations to be encountered at work and leading to typical work behavior to deal with the exemplary situation.

The opposite of “exemplary” in this context would be “general”, which was the ideal in TVET for far too long. Teachers had to make student understand the general approach to dealing with work tasks and issues, while introducing abstract concepts in some artificial school or training center workshop settings that should equip students to deal with the realities of work life.

As a matter of fact, research on “transfer of learning output” has established that the translation of learning from training into the workplace, i. e. **the transfer into work practice is dismal**, Newer findings claim that only 10 to 20 % of traditional learning makes it into the workplace (Weber 2014), which is by all standards unacceptable training efficiency. By implication, teachers must construct a learning environment that resembles reality as closely as possible and that recreates examples from work life that is being lived through during training in all detail.

Only if TVET heeds these requirements of exemplary teaching, learning can become effective in work life. **The learning situation must be as close to the work situation as possible**. If that is not the case, transfer of learning is highly unlikely—something that has been known in education psychology for quite a while (Haskell 2000), but has not found its way into TVET in full force and effect.

EL should be structured according to the following course of action:

- **Step 1:** For each competency item on the curriculum, teachers gather an authentic and close-to-reality example that they know of or obtain from the sector’s practitioners.
- **Step 2:** These examples are then refined, or in pedagogical terminology undergo “didactization”, meaning adapting the learning material and language to be readily used in the classroom or workshop.

Pragmatic QTA Hint:

“Didactization” by the teacher means:

Prepare and edit a real-life situation for students’ utilization in TVET. This sometimes means reducing the complexity of the authentic case, e. g. by leaving out some extra demand of a customer, cutting out some technical terms for beginners, providing a shortcut hint for longish tasks etc. In doing so, the teachers transforms real-life examples by didactic tinkering, making it appropriate for usage in training and education.

- **Step 3:** Making students aware of the real character of their task or problem to be solved in order to increase relevance and motivation.
- **Step 4:** Creating a team-based or work-alone experience, depending on how it would be in real work life.
- **Step 5:** Supporting the process of solving real-life examples by counseling only, to make learning a self-organized and self-regulated process to the largest possible degree, i. e. by providing technical input and hints only if unavoidable.
- **Step 6:** Asking for presentation-like products to showcase or demonstrating solutions to learning peers.

- **Step 7:** Grading of exemplary learning can be based on the process, the presentation of results or even better, both.
- **Step 8:** Exemplary learning experiences always need to be discussed afterwards from a meta-cognitive perspective, i. e. by mentally imagining transfers to real work life and making reflective entries into written instruments of reflection about these important transfer effects of learning and acquired competence into an envisioned job.

Exemplary Learning is an overriding principle that **rules out abstract or purely theoretical learning in TVET**. As a consequence, it should be heeded during all planning of teaching--and practical case studies must be the blueprint for TVET.

There is **no excuse conceivable for ignoring EL**, considering the findings of successful transfer effects of learning. If TVET institutes want competencies acquired to be usable—and want to **stop complaints of companies about insufficiently trained graduates** for the necessities of work life—, then **EL is the pedagogic principle to adhere to** and all learning must be exemplary.

5.3.3 Experiential Learning (EXL)

Experiential Learning (EXL) is closely linked to the previous principle, but it is by no means the same. EXL has two strands:

- (1) EXL means basing all teaching and planning on prior experiences of learners that are no children any more in TVET, i. e. learners that possess a rich history of experiences, at least learning experiences, sometimes even work experiences.
- (2) EXL also means basing all new learning in TVET on real and first-hand experiences made themselves and constructed by the learners as active shapers and creators, i. e. engaging in non-passive learning activities.

EXL completely deviates from behaviorist and cognitive learning theories and breaks with the traditional perception of TVET that competence can be achieved by reasoning and mental processes alone (cf. Kolb 2014). He posits the empirically proven doctrine of learning theory, which is even more pronounced in all technical and vocational learning:

Human beings learn best from experiences.

Basically, that doctrine **shatters all pretense to teach theory** in TVET.

Key QTA Insight No. 26:

The pedagogical principle of experiential learning stands on the shoulders of such intellectual giants as John Dewey, Kurt Lewin, Jean Piaget, and L.S. Vygotsky, and establishes the **theory of learning by experience, all the while identifying experience as the most effective mode of learning**, corroborated by three decades of learning research.

Such findings undermine the concept of teaching pure theory in TVET—and should rule out “theory only” teaching in future.

The pedagogical principle of EXL **legitimizes the drive towards activity-based learning** in TVET. But activities must not be based on being active alone, they must be goal-driven and comprise experiences that are either directly relevant in TVET (such as an example of a work task taken on for practice in exemplary learning), or an experience that furthers soft skills such as in role plays or real-life simulations. Even computer simulation-based experiences are acceptable, according to Kolb’s interpretation of EXL (2014).

EXL amalgamates the primary **experience via the basic five human senses** (touch, taste, smell, sight, and hearing) with accompanying environmental factors (e. g. location, body position, temperature, time etc.—sometimes also considered as components of additional senses in more esoteric worldviews), cognitive operations as well as emotional perceptions. Altogether these elements of the **holistic experience of work** or work-related learning situations contribute towards the development of competencies. To make students aware of the complex components that are decisive factors in successful working events, a thorough presentation, discussing and reflection phase after EXL is required.

To put the foundational buttresses of EXL to work, teaching is structured as follows:

- **Step 1:** For each competency on the curriculum, institutes and teachers need to identify potential learning actions and experiences that may lead to the acquisition of the conglomerate of competencies to be taught.
- **Step 2:** After potential student actions and experiences are singled out, suitable methods for these experiences must be sought out and twisted to fit the intended first-hand experience (e. g. such in a certain case study that can be performed in a role play in the end).

Pragmatic QTA Hint:

A large repertoire of activity-based teaching methods that a TVET teacher has at her disposal proves a boon for planning EXL. **For teacher trainees or neophytes, team planning with experienced colleagues is essential.**

Teaching methodology books or method online databases should be available during planning EXL in order to increase the pool of potential methods.

- **Step 3:** Teachers allow students to live through their own learning experiences in full, i. e. teacher interference has to be reduced to a minimum.
- **Step 4:** All experiences in TVET should be team-based as much as possible, not least to ask for and obtain feedback from peers. Teachers should **cultivate a culture a feedback among peers**, especially after concrete learning experiences.
- **Step 5:** Learning experiences must be presented and be put up for questioning by peers and teachers alike. Mostly, the emphasis should be on the process, but also a certain outcome to be achieved, if relevant (e. g. if EL and EXL are combined). Proper hard skill training expects more outcome-based presentations.
- **Step 6:** Complex experiential (just as exemplary) learning always needs to be discussed and mentally construed afterwards, from a meta-cognitive perspective, i. e. plucking tactile, cognitive and emotional components of effective working experiences and checking how much overlapping there is between actual working and the learning experience. Also making reflective entries into written instruments of reflection about these important experiences is a must, i. e. a mandatory requirement of EXL at the end.

As a matter of consequence, **all learning in TVET should be experiential learning.** Input phases should simply serve a “helping hand” by teachers, or constitute a preparatory step taken by students independently by applying the concept of the “flipped classroom” (see Chapter 5.3), that means researching and incorporating required information on their own.

5.3.4 Problem-Based Learning (PBL)

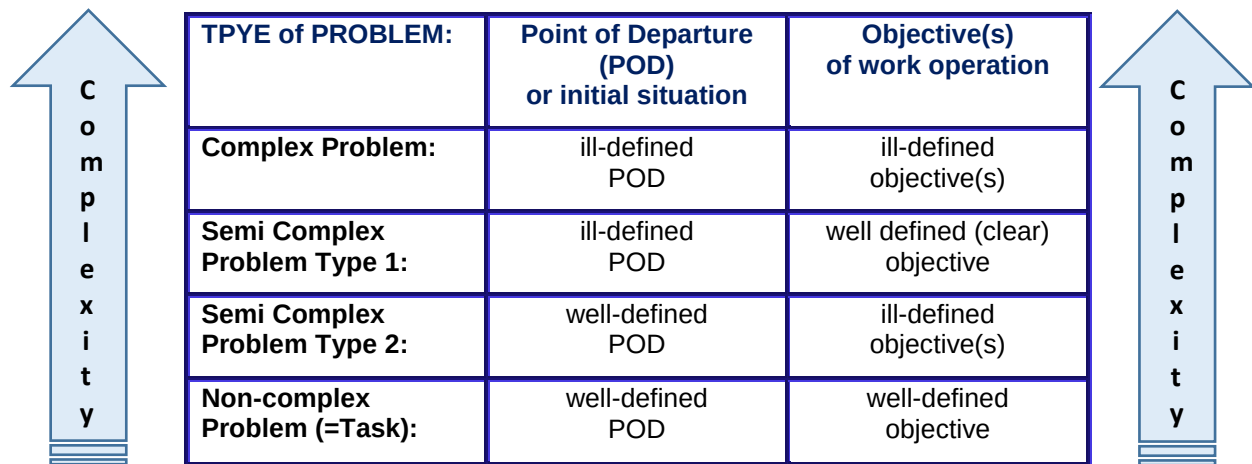
Problem-based learning (PBL) is one the essential underpinnings of modern TVET, encompassing the stimulation of hard and soft skills acquisition simultaneously and fostering the learning of relevant competencies in the labor market very effectively (cf. Boehner & Dolzanski 2016). Unsurprisingly, latest findings indicate substantially higher learning attainments, higher motivation and a better atmosphere within the study group, for students engaging in PBL (e. g. cf. Witte & Rogge 2016).

In practice, PBL is often put on the same level as Task-Based Learning (TBL). While both principles rely on the same tenets and pedagogical intention, there is a major difference between the two:

Work Problems versus Tasks in TVET:

Authentic work problems are not solved easily. They cannot be approached by some standardized pattern of work or some work routine. Thus pedagogical problems always involve some degree of creative thinking, flexibility, combination of prior experience-based learning effects, group communicative exchange and synergy, research, planning, trial and organization (Ertmer et al. 2015). All of these needs to solve a problem are generally discussed as key competencies or soft skills. Moreover, to solve a problem usually comes on top of the ability to work effectually with respect to ordinary and everyday work duties. Hence, PBL requires some priorly existing hard and soft skills. If only few existing competencies in a certain occupational field are available, then learners are either well-trained in synergetic group work to engage in self-directed research or the teacher lays the groundwork by handing out so-called *Advance Organizers* (see Chapter 5.1), to provide anchors where to start from. The teacher may also provide self-learning tutorials online.

Problems in TVET can come in different shades of difficulty, and can be honed to fit the group of learners (Doerner 2003):



TPYE of PROBLEM:	Point of Departure (POD) or initial situation	Objective(s) of work operation
Complex Problem:	ill-defined POD	ill-defined objective(s)
Semi Complex Problem Type 1:	ill-defined POD	well defined (clear) objective
Semi Complex Problem Type 2:	well-defined POD	ill-defined objective(s)
Non-complex Problem (=Task):	well-defined POD	well-defined objective

Figure 12: Types of Problems in PBL

This implementation of this matrix of problems with respect to teaching methods can be easily observed in the **characterization of case studies**, as there are several types according to the type of problem involved:

- (1) **Exploratory** Case Study, involving a **complex problem**
- (2) **Explanatory** Case Study, involving a **semi-complex problem**
- (3) **Descriptive** Case Study, involving a **task**.

Exploratory work is more research- and inquisitive-based, while case study type (2) goes ahead by explaining a problem and fathoming a route towards a solution and case study type (3) involves describing the situation at hand and what to do on a regular basis after having understood, identified and seen through the typical task.

So, what are plain work tasks in TVET?

Tasks are characterized by a varying degree of routine, ranging from 100 % standardized job routines, such as the change of oil in combustion-based vehicle or the reception of a guest in a restaurant that has booked a table in advance, to only partly routinizable aspects of work, such as dealing with complaints, e. g. a guest dislikes the hotel room provided or the installed heating/air conditioning system breaks down after a day again.

The last two examples of tasks can quickly turn into problems, for example if the customer complaint **cannot be rectified by typical routine measures**, such as providing another room if the hotel is fully booked or a standard procedure of checking the functioning of machinery and appliances or identifying the fault and instantly repairing it by standard equipment does not work.

QTA Key Insight No. 27:

Problem-Based Learning relies on four different types of complexities, **ranging from typical work tasks to complex problems**. All can be used for learning, depending on the level of training and the composition of the group of learners. And in all four types of PBL, there is a **holistic advancement of hard and soft skills**, living up to the requirements of demand-driven and forward-looking TVET.

5.3.5 Reflective Learning

Reflective Learning (RL) is not a primary mode of learning, which means it constitutes a **secondary principle of learning that is always coupled with at least one of the four previous ones**—and builds on top of them, i. e. **deepening learning effects**. Again, there are two different strands of reflective learning:

- (1) **RL “while learning”**: That means, intermittently, the learner leans back on muses over the state of affairs, own interim achievements and how to move on as a next step. RL “while learning” can be more than a customized mental exercise. Accordingly notes can be taken in for example “Reflective Scribble Note Pads”, to sort out hurdles to understanding and, sometimes, to put complex thinking processes in order.

- (2) **RL “after learning”**: That is **the ultimate learning activity**, making prior learning lasting, successful, transferable and **truly effective** (cf. Borich 2016). It can start out as a regular and routinized mental exercise, then leading to open up during reflective discussions with peers and teachers, and finally to taking written notes--to come back to these notes some other time, enhancing how to retain subject matter and how to achieve sustainable learning. For the purpose of reflections in written form, **special instruments** are needed, such as **Learning Diaries or Learning Portfolios** to serve the purpose best (see Chapter 8 for further explanations).

QTA Key Insight No. 28:

No matter what, **RL must find its place, at least at the end of any teaching and learning session as a general practice in TVET! It augments the learning outcome tremendously** (cf. Horton-Deutsch 2012 or Ryan 2015).

There are several ways to make RL part of the day-to-day learning routine in TVET, such as asking for meta-cognitive contemplation and pondering about learning processes and outcomes as well as learning needs ahead. In addition, teachers may establish regular peer-to-peer interaction groups regarding their reflective insights about past learning and invite voluntary reflective statements in plenary discussions. But most important is the usage of **instruments of reflections in writing**, such as the Learning Portfolio, the Learning Diary or even a more **informal Learning Journal**.

As a result of following all five determining principles of teaching and learning in TVET, **contemporary teaching must be turned on its head**, literally, as too much emphasis is still placed on the teacher as the “medium of classical instruction”.

Everybody’s time and effort can be used more effectively and efficiently, the teacher’s and the student’s resources alike, by the methodological concept of the “Flipped Classroom”.

5.4 The forward-looking concept of the Flipped Classroom

The so-called “Flipped Classroom” is not a single and isolated teaching method, but rather a methodological system that incorporates manifold modes of teaching and learning that postulates **a foundational and new concept of delivery**.

As explained earlier, delivery is a very misleading term here. It is only existent because it represents the **established technical term used in quality assurance**, as laid out by the International Standard Organization (ISO).

As matter of fact, **in the flipped classroom, nothing is delivered to students any more**. Instead, the student “goes shopping and searching” for the teaching input needed, with teaching and learning options—let us call it the “product range” available for shopping—provided by the teacher. Teachers counsel during the process, facilitate the searching process and, obviously, the achievement of a final product of teaching.

The metaphor taken from “going shopping” may serve as an introduction to the concept of the flipped classroom that has **wide-ranging ramifications for methodological proceedings in TVET**.

To understand the basic makeup of the concept, the following structure should be of assistance:

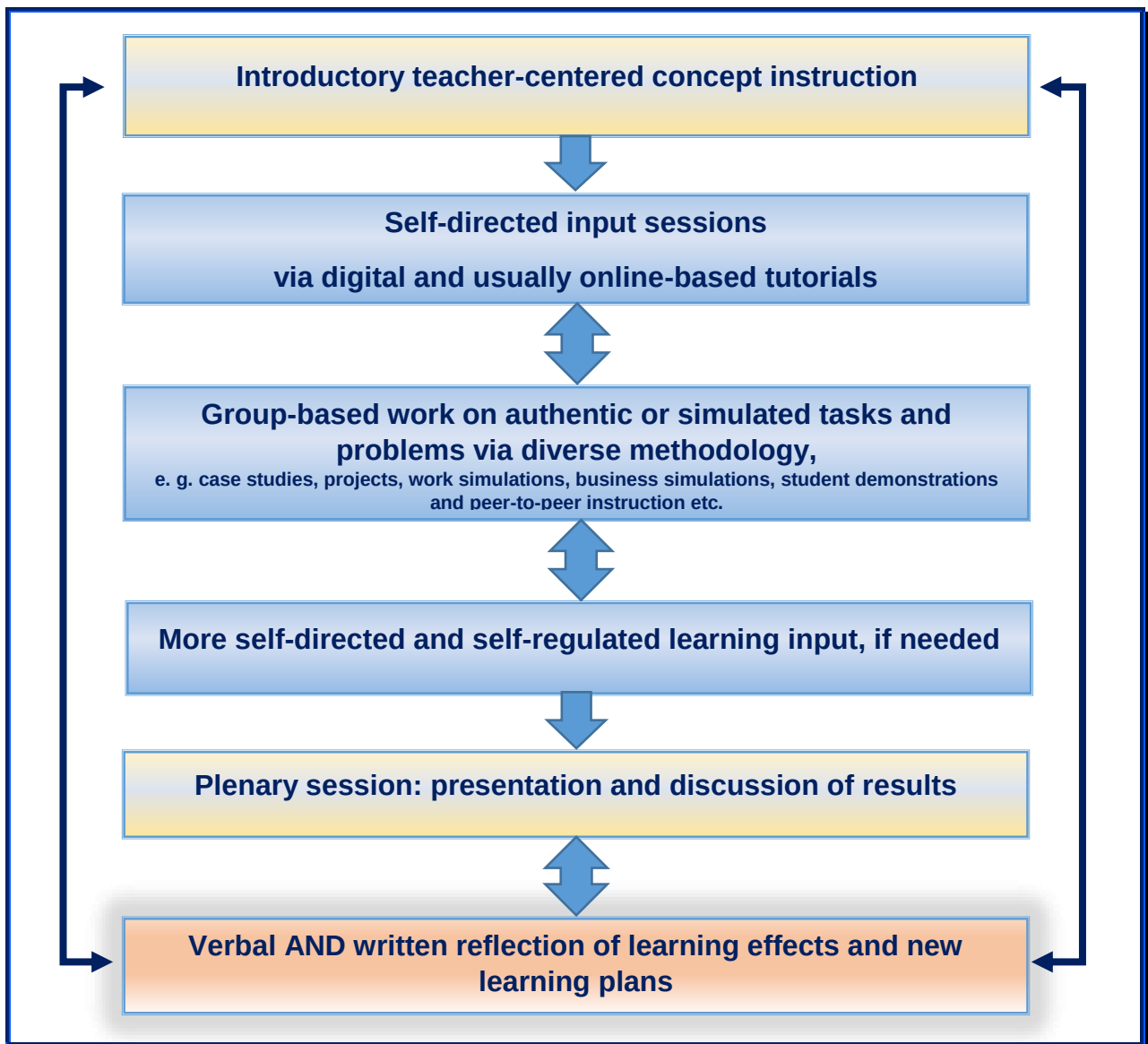


Figure 13: The general pedagogical cycle of “the flipped classroom/workshop”

Generally speaking, the teacher introduces the idea of the flipped classroom to students and lays down the teacher's expectations. To meet these expectation student may need

- **input**
- **knowledge**
- **process demonstrations**
- **technical drawings and product sketches,**
- **optimum procedures**
- **research findings about effective work**

and much more.

All of this can be found in

- **online tutorials**
- **podcasts and speeches**
- **slide shows and pictures**
- **online manuals**

etc.

These sources can and must be digitally accessible and are to be “consumed” at individual speed, and repeated if necessary. Problems of understanding will be addressed first in peer groups that constantly engage in IDL, EL, EXL, PBL and RL, **the five principle of good teaching in TVET in action**. The teacher's role is that of an organizer of the learning processes, a technical expert as a resource person of the last resort, a learning counselor, a continuous assessor and a respected expert of pedagogy and learning processes. All student-activating methodology beautifully goes along with the concept of the flipped classroom. **In contrast, lectures, illustrated talks, teacher presentations etc. do not go down well with that concept.**

Pragmatic QTA Hint:

For the teacher to **produce “digitized” material for students** to work with, she can easily “manufacture” and upload own little input sessions, as per the following instructions:

- grasp the subject and message to talk about in full
- fine-tune your core message that you want to get across
- use a focused visualization in the background (e. g. stand in front of a whiteboard)
- sharpen your speech and usage of technical terms
- if possible, make it fun watching the tutorial
- limit the recording to 5 to 8 minutes, the ideal time frame for a tutorial according to research on attention

- get a little tripod, attach your smartphone or digital camera to it—and record yourself
- **upload the file to some e-learning platform** if you want to restrict usage to your own students or upload on such platforms as Youtube.com for a wider audience and disseminate the web address.

And “voilà”, your ready-made tutorial is available for usage in the flipped classroom, or rather outside of the real physical classroom, but contributing to its success. And it is fun producing such tutorials. Check it out!

The teaching process is characterized by the highest possible degree of self-organized and self-regulated student learning and student-centered action. The teacher is only center stage when explaining the learning process and organizing special learning events, such as interim presentations. Early on, the teacher may focus on developing the soft skills needed to make the flipped classroom concept work, **especially the ability to work independently**, in a self-reliant style, engage in productive team work and to adapt to different challenges.

Obviously, that is a long way to go for many trainees in TVET, and intermediate states are acceptable too. The reasons may be a lacking internet infrastructure, proper speed and suitable devices in sufficient numbers; in such circumstances printed material may be used as a stopgap.

Henceforth, the flipped classroom will be the vision to achieve in TVET.

QTA Key Insight No. 29:

In the concept of the flipped classroom, student-centered action reigns supreme. All teacher-centered methodology is forfeited in favor of self-regulated accessing and finding required information from, if feasible online, sources that can partly be provided or added to by the teacher, depending on the skill-level of the students.

The “**Flipped Classroom**” is set to revolutionize teaching in TVET, as it aims to relegate input sessions to a sphere outside of face-to-face teacher-learning interaction. That will free enormous counseling and supporting capacities on the teacher’s side and turn students into autonomous and responsible learners, capable of lifelong learning and of adapting to new challenges.

5.5 E-Learning: a formidable concept to facilitate true learning

What is the rationale behind large-scale e-learning in TVET?

In a modern world, ordinary citizens have to cope with a **large knowledge base that is factually obliterated after a couple of years**. Even experts in a certain field are unable to grasp the entire body of knowledge in their realm, not to speak of making skillful use of it in everyday life or work situations.

Citizens of any state have to face a challenging world, crossing borders and developing ever faster, technically and scientifically. Hence, an educated human being of today is capable of updating knowledge and the own skill base on a constant basis, in order to function adequately in society. This is increasingly being done by tapping online encyclopedias, consulting self-help websites and absorbing podcasts or clips that instruct viewers. The ability to access and use these sites, i. e. to find suitable and reliable information and instruction as well as not only consuming but constructing new knowledge and skills, **is the essential competence of handling e-based learning**. The competence to independently engage in e-based learning determines the future of individuals in the tech-determined era to come.

It is a very good start to **begin with an elaborate e-learning platform** that is user-friendly, i. e. easy to handle even for non-IT geeks.

However, there is one major snag in the thrust for e-learning. Even though each teacher can create e-courses autonomously, that involves a tremendous amount of work to prepare appealing and interesting as well as didactically appropriate material for learners to consume. But there is **a great deal of e-material already available on the web, free of charge and ready to peruse**—usually in English though, which is a foreign language for most of us.

Key QTA Insight No. 30:

There is **a plethora of very professional input sessions** to be found, literally for each aspect and occupational niche one can think of, for example on *youtube.com* or on many e-learning platforms designed for the purpose of learning and studying, such as the non-profit site *khanacademy.org* or entirely free-of-cost courses on sites as *coursera.org* or *udacity.com*. However, **the language to master is English in e-learning**, if you want to benefit from this great source of lifelong and fun learning!

Pragmatic QTA Hint:

E-learning is also ready-made for continuous education and deeper learning. For a working person that may consistently be short of time, there are so-called **nanodegrees** to obtain on special e-learning sites, providing the chance to acquire new or enhanced knowledge and skills in some very special field without signing up for a long-term course.

English is the *lingua franca* of the international scientific, business and IT community. Moreover, according to brain research, **being at least bilingual seems to raise the individual intelligence by a few percentage points**, most likely through the increased interaction of the cerebral areas, the so-called *Wernike* and the *Broca* regions, in the human brain that are involved in acquiring and using a foreign language and thereby enhancing the interaction between the two brain hemispheres. Consequently, engaging in e-learning in TVET may enable future employees to do **more lateral and holistic thinking**, the key abilities to problem-solving and creative work.

Not least, most renowned databases and the bulk of knowledge and information on the web are published in English. Next to the **key ability in life** to find, retrieve as well as process that information and to transform into a useable competence, **the level of English must be sufficiently advanced so that understanding is ensured in the first place**, as a quasi-condition for successful learning.

QTA Key Insight No. 31:

As a result of the rise of e-based and lifelong learning, the following abilities are to be promoted in TVET, consistently:

- (1) **understanding spoken and written English** at an advanced level, generally and technically
- (2) **finding, retrieving and processing** new technical information, processes and discoveries.

There is no way around, **e-learning in the 21st century is here to stay in TVET**. The following section gives reasons why. Accordingly, the general thrust with respect to e-learning in TVET should be:

Main e-learning goal No. 1 in TVET:

Mass distribute e-learning and enhance computer literacy as a key factor of lifelong learning. These endeavors serve as a pre-condition for economic and individual well-being and long-term work-life adaptability. The development of successful modern countries is also propelled.

Reasons: E-learning is the single and outstanding capacity individuals need in a modern world to update their knowledge and skills, and protect themselves against the constant threat of being unemployed or even unemployable in the labor market due to a misfit of outdated competencies, according to the requirements of companies that compete globally (for evidence, see OECD 2015). But even managing private lives makes e-learning a mandatory need of lifelong learning since changes in laws, tax codes, regulations and even culture and language stipulate the ability to come to terms with them. Living the life of an educated and responsible citizen also asks for e-literacy.

Topically, e-literacy is in high demand, as a share of below 30 percent of the population in many developing countries command a basic computer literacy that goes beyond smartphone and social media handling (Tran & Dempsey 2017), which compares rather unfavorably to countries on the march as well as to Western or Latin American countries. That being said, sophisticated computer literacy and skills may also be hard to find in highly developed countries, which opens up a development chance for other countries (ibid).

Main e-learning goal No. 2 in TVET:

Boost soft skills via e-learning that are directly needed in a successful professional and private life as well as for countries to develop economically.

Reasons: There is a number of soft skills human beings need to be successful in life and to be reasonable and economically as well as politically mature citizens. Most of them are not imparted by parents naturally, as they deviate from what is needed in family life. The following list will name some soft skills that are asked for in work life, as confirmed by studies under the research umbrella of “key competencies” (see for example OECD 2013), and that are profoundly and sustainably stimulated by engaging in e-learning:

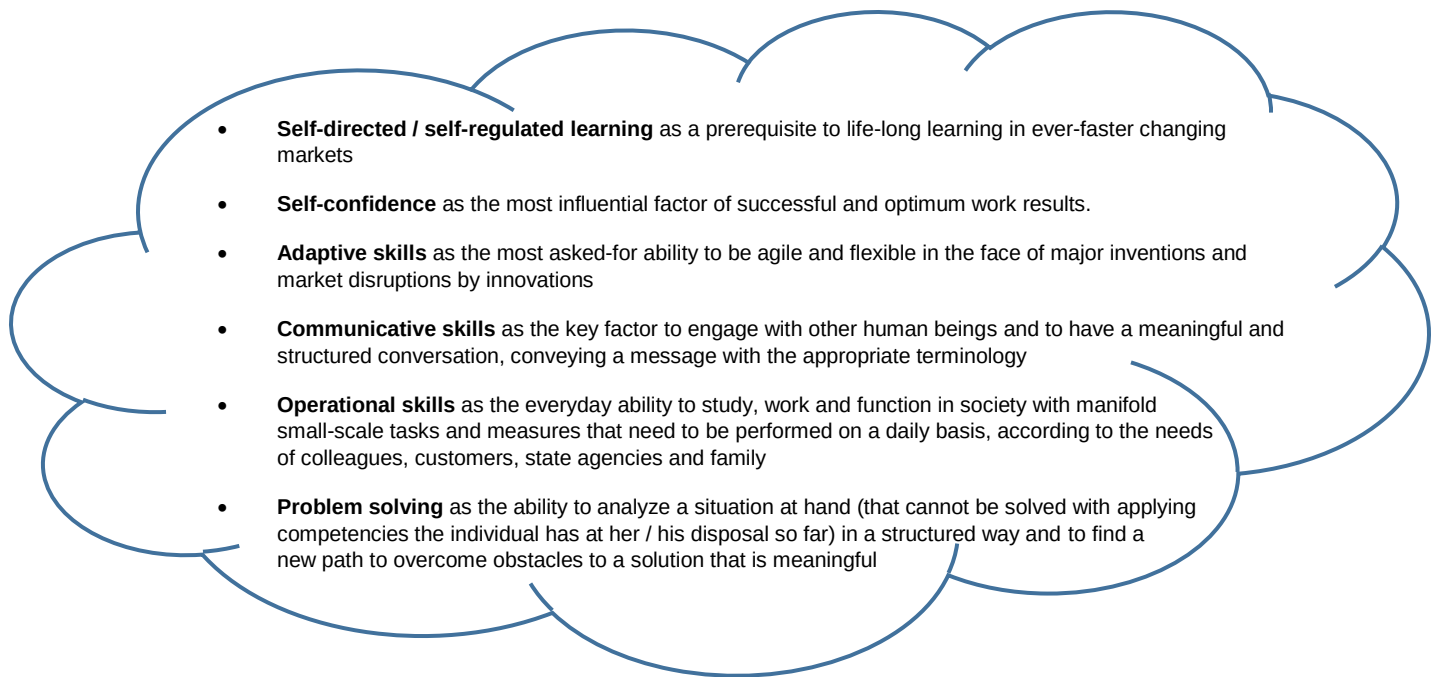


Figure 14: “Up in the cloud”, i. e. promoted by e-learning: important soft skills

For example, there is ample evidence that literacy is strongly linked to problem-solving skills using digital devices. Or in other words: **the higher the familiarity with digital devices and the usage of digital applications, the higher is the participation in the job market and the more people earn.**

For clear-cut evidence regarding correlation figures, results of the large-scale international study “Program for the International Assessment of Adult Competencies (PIACC)” provide fertile ground.

Main e-learning goal No. 3 in TVET:

Raise the level of spoken and written English considerably, to turn long-term students into fully competent and self-confident speakers of English—e. g. at least one level on the six-point European reference scale for competence in foreign languages.

This goal may seem to be self-evident so that it goes without saying. But that is not the case because there are some poor e-learning platforms that support the acquisition of English by focusing on grammar and passive listening or reading.

In contrast, there are e-learning platforms that are cutting-edge in terms of technology but also in pedagogy, didactics and methodology of acquiring foreign languages (cf. Curtes 2012), e. g. as operated by the company EF or the British Council.

They comprise a well thought-through approach and a package of all four language abilities, endorsed by leading researchers: listening, speaking, writing and reading. This way, language abilities can be promoted in TVET by engaging in e-learning. After this, trainees are ready for technical e-learning systems.

The e-learning approach in TVET works best if it is **turned into a Blended-Learning concept**, i. e. teachers take up the issue of turning to sticky points in the classroom and provide a forum for testing and checking new abilities with peers face to face.

Naturally, the highly individualized options of e-learning regarding possible repetitions and speed must not be underestimated. E-platforms are not restricted and work well for students with very different levels of competence.

QTA Key Insight No. 32:

Ultimate goal:

It is essential to train TVET teachers with regard to established and popular e-platforms in TVET (e. g. Moodle), so that they can turn e-learning it into **a blended-learning concept in the long run**, which the potential to teach soft skills, hard skills and language skills simultaneously.

Moreover, various games and simulations are largely e-based these days. They are magnificent, motivating and exciting possibilities to enhance learning in TVET.

But as the case for e-learning has been made in TVET, **games can also be used in a non e-based fashion**.

For that purpose, the next section expands on game-based learning in TVET, without using digital equipment, suitable to any learning environment and available resources, after a short excursus still on the “paradigm shift” caused by modern technology.⁶

⁶ The template for the excursus was concocted and worked out by **Mr. Sudath Liyanage from the University of Vocational Technology** in Rathmala to which to author owes a great deal of input and insights.

Pertinent excursus: Integration of Modern Technology in TVET

With the advancement of technology everything has to change, and TVET is no exception. The integration of technology in general and Information and Communication Technology (ICT) in particular has caused **a paradigm shift** in developed countries already.

Two terms are especially important: one is **Learner Management System (LMS)** and the other is **Open Education Resources (OER)**.

In larger TVET institutes, there are generally computer labs, a server and a networked system available. Then, launching an LMS for students is not a difficult task.

An LMS prepares an electronic platform on which teachers (facilitators) design more interactive activities through which learners construct knowledge in a collaborative environment that has cleared the barriers of time and space.

Institutes commanding their own server may install their own LMS, perhaps by creating a **freeware “Moodle” environment**, with some support from an ICT specialist.

Until such time, institutes may also search for “free LMS facilities for teachers” on the Internet. For example, Google “openLearning” may provide the first experience in this regard.

Then, instructors and lecturers may easily sign up and upload materials, give assignments, feedback and enhance interaction among students through discussion forums.

More generally, **cloud computing** can be used to share work for groups of learners, make them interact and provide their “products” for all. The most widely used clouds which are available for free are “Dropbox” and “Google Drive”, for the moment being.

In addition, the Internet is full of resources which are freely available and that have the capacity to enhance one’s knowledge tremendously in almost any field. Students following an institutional course and that have Internet access at home--or can use an e-café, which are mostly universally available—may benefit. A smart phone is frequently quite sufficient as well.

Anyone willing to get into the world of potential tech learning can use a search engine and type one of the following search keyword:

- *Alison Courses*
- *Coursera*
- *FutureLearn*
- *Canvass*
- *edX*.

It is advised to enter and sign up for one particular website. These websites are “virtual higher-education institutes”. A small-scale search to find out what e-courses are available brings about technology-related courses *en masse*.

Those courses provide very useful supplementary support for students that are able to master English.

Example: The “Psychology of Education” free e-course, offered by *Alison*, may prove to be a useful support course to any teacher trainee in TVET.

All courses are for free. Teachers and students alike should browse such courses, to enhance their knowledge and abilities as well as enrich classes by inserting external input.

These days, **any TVET teacher should use modern technology** to supply students with more interactive and collaborative learning environments.

Finally, OER, i. e. Open Educational Resources, can be made use of by teachers, as the Internet is full of resources. That does not mean that all are for free. However, there are plenty of resources which can be used with no costs involved.

To find them, teachers shall search for OER and for the topic they look for, but remaining aware of certain copyright and license restrictions.

5.6 The methodological concept of educational games in TVET

5.6.1 Educational Games in TVET. Why?

The first step is to provide a research-based background for the implementation of a methodological concept for educational games in TVET. This is to convince critics of game-based learning that are numerous because of intrinsic doubts that games and learning go together well.

To show that educational games do not only conform to a common learning goal but enhance learning outcomes tremendously is the objective of this chapter.

Educational games have been all the rage in Europe and the US with the onset of computerization, and with the spreading of the Internet at the turn of millennium even more so. The primary idea was to integrate classical games into appealing and interactive learner platforms that immediately provide feedback on the performance achieved, to incentivize students to try again and do so even better (cf. Kapp 2014).

The overriding argument was that games are generally superior to traditional teaching because of the attributes listed below. Traditional teaching is widely perceived as unable to match such features. The upshot is discussed in educational literature as indispensable *gamification* of the educational process, cf. Simko 2014).

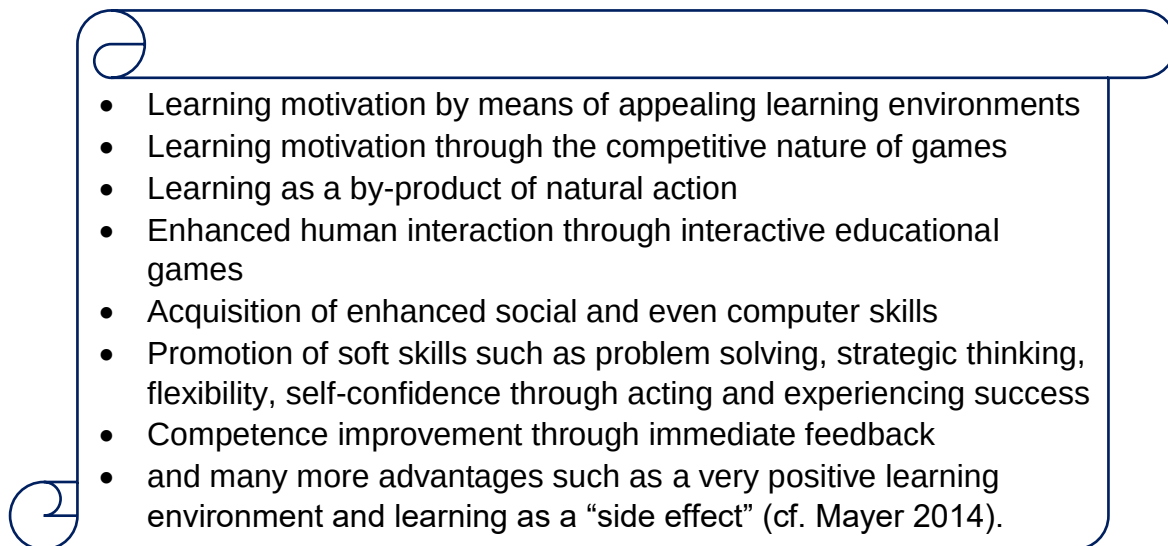
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- Learning motivation by means of appealing learning environments
 - Learning motivation through the competitive nature of games
 - Learning as a by-product of natural action
 - Enhanced human interaction through interactive educational games
 - Acquisition of enhanced social and even computer skills
 - Promotion of soft skills such as problem solving, strategic thinking, flexibility, self-confidence through acting and experiencing success
 - Competence improvement through immediate feedback
 - and many more advantages such as a very positive learning environment and learning as a “side effect” (cf. Mayer 2014).

Figure 15: Propitious attributes of game-based learning

However, the results of *gamification* did not always live up to the envisaged enhancement of learning (Mayer 2014).

Nonetheless, there are a few empirically based findings that support the usage of games-based learning strongly (cf. Moseley 2014):

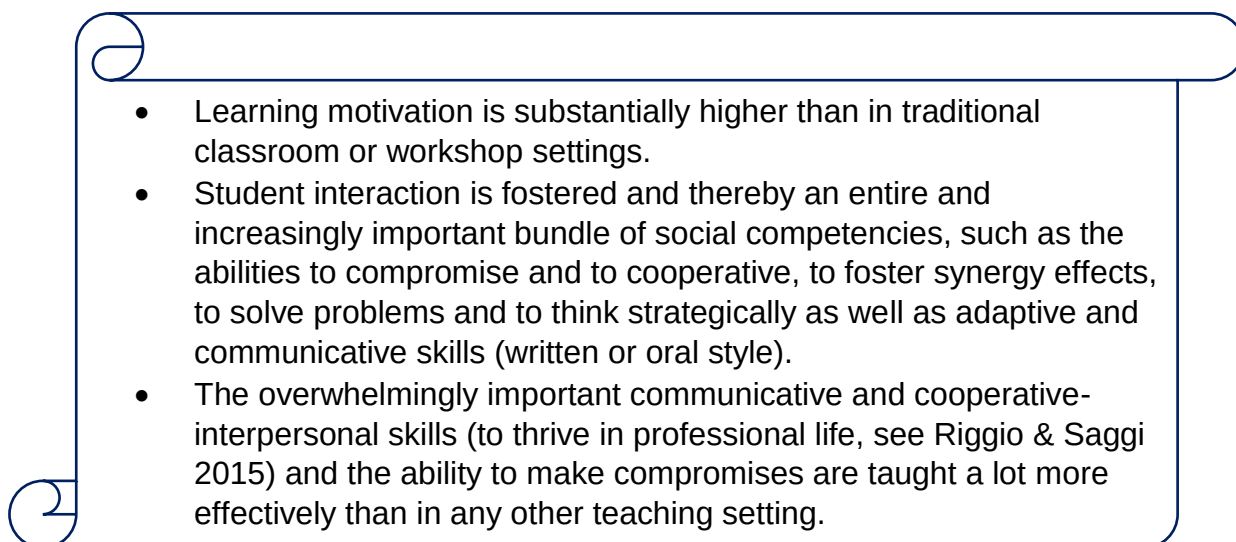
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- Learning motivation is substantially higher than in traditional classroom or workshop settings.
 - Student interaction is fostered and thereby an entire and increasingly important bundle of social competencies, such as the abilities to compromise and to cooperative, to foster synergy effects, to solve problems and to think strategically as well as adaptive and communicative skills (written or oral style).
 - The overwhelmingly important communicative and cooperative-interpersonal skills (to thrive in professional life, see Riggio & Saggi 2015) and the ability to make compromises are taught a lot more effectively than in any other teaching setting.

Figure 16: Supportive research results for game-based learning

Consequently, quantitative results with regard to game-based learning support the theory that this method of learning is more effective. This is particularly true in areas that are potentially very relevant in TVET settings because of the heightened need to foster soft skills for the labor market. **Moreover, the findings underpin the notion that traditional games can be used as effectively as computer-based gaming.**

For several soft skills such as communicative and interpersonal skills, traditional games with direct interaction are proven to be even more effective (cf. Wagner & Karlheinz 2014). Traditional games do not only involve “old-fashioned” games such as card games, dice, tug-of-war etc., but rather cutting-edge gaming equipment, especially designed for the acquisition of elaborate soft skills (cf. Metalog 2016). This state-of-the-art games equipment is not based on the usage of computers or the internet, i. e. suitable to any setting and facilities.

Professional technical competencies can be acquired via such games as well if the teacher is innovative and makes use of the equipment adequately.

As regards the usage of computer-, internet- and cloud-based games, there is always an option to enhance acquisition of learning by supplementing traditional games (cf. Whitton & Moseley 2012). In a **blended-learning setting**, they can beautifully enrich any class and may allow for learning technical finesse. For this purpose, computer-based **simulation games or management games** are highly recommended in TVET.

Perhaps the best argument for the application of educational games is that the shift from teacher-centered to student-centered learning, which has been strongly promoted in TVET and adult learning throughout the publication of findings in cognitive brain research and constructivist learning theory, really takes place. The TVET teacher becomes a facilitator, a counselor and a technical expert to ask for support in generally self-regulated learning processes (cf. Kriz 2014).

QTA Key Insight No. 33:

So the bottom line is, after consulting research into educational games:

Educational games support the shift from teacher-centered to student-centered learning and considerably enhance the acquisition of indispensable soft skills in TVET.

This also makes the case for introducing **educational games in the TVET system of developing countries** in particular, since such skills are in high demand to continue and steer the development process.

Because educational games involve a totally different approach in comparison to the still prevalent instructional paradigm, teachers overwhelmingly do not know yet how to integrate games in their educational environment and their lesson planning. The ordinary teaching toolkit imparted during teacher training is commonly not very useful for the game-based approach.

The reason is that games are based on

- challenge
- reward
- learning by doing and
- guided discovery.

This forms a sharp contrast to the “tell-and-test” teacher-centered method of traditional TVET instruction. Some types of games—such as complex strategy and cooperation games—are also not necessarily compatible with the typical duration of a training session. That is why some **flexibility in TVET institutes with respect to right timetables or teaching hours are needed** in future.

Key QTA Insight No. 34:

TVET institutes and teachers **have to become more flexible** with respect to the setting and timing of their teaching sessions if they sincerely want to integrate highly effective team-based educational games.

5.6.2 Achieving *gamification* in TVET

TVET teachers must learn how to integrate educational games into their teaching learning arrangements, instigated by proper teacher training focusing on planning.

In addition, teachers need to rethink their role as educational professionals, **mainly through teacher training or continuing education**. This will also enhance the attractiveness of TVET and, of course, further the skills and teaching competence of TVET academic staff.

Because there are many “serious” games--the descriptor “seriousness” indicating that they are tailor-made for relevant themes regarding skills needed in the labor market--**gamification turns into a priority in TVET** in order to **teach skills that industry and business truly need**.

5.6.3 A new learning theory for educational games in TVET

There is a newish pedagogical and novel learning theory underpinning use of educational gaming in TVET: connectivism.

Connectivism is a learning theory that has been developed especially for the challenges of learning in the 21st century and focuses on the new learning possibilities for ‘connected learners’. In comprehensive role plays, or more generally speaking, educational games, players are connected to each other and are able to learn and cooperate while playing their roles. TVET teachers will have to transform the principles of connectivist learning theory into didactical practice, using games in a world of connected learning. Teachers have to integrate educational games on a connectivist basis into their long-term planning and also use design short-term teaching plans accordingly (for further details see chapter 2 and Boehner 2016). The usage of educational games can be easily integrated in the different phases of traditional teaching sessions as well (e. g. such as introducing, instructing, self-regulated working, presenting, reflecting, which means a learning game can be played during the phase of “working”). Games can also be labeled as innovative teaching practice and “take over” the entire session.

Gamification will accomplish a sizable chunk of the task to prepare TVET for the future generation of learners.

According to Michael and Chen (2005), **the next generation learners is too demanding to tolerate lower levels of interactivity and engagement** which traditional education features presently. Serious games is bound to become a standard part of education and training. All in all, the additional benefits of gaming in TVET teaching by integrating serious games include:

- ability to comprehend complex systems
- higher engagement with learning material
- advantages of interactivity while learning
- compatibility with other student-centered teaching methods
- cost saving by reducing teacher-centered skill training time and
- less expensive than doing the same training in a real world setting.

5.6.4 Further arguments supporting gamification in TVET

Adam Smith, as the founder of market-based economics, already described any action in free markets as a *game-like interaction*, or the invisible hand of market forces. This is why skills that are needed to acquire the ability to succeed in a market-driven world can be obtained highly efficiently by means of educational games. Evidently, these games

work best if they have been developed for sake of training soft and technical skills and are purpose-built (e. g. Metalog 2016).

Pragmatic QTA Hint:

Successful teachers in TVET make use of educational games to promote the acquisition of soft skills and hard skills, in order to become a teaching professional that facilitates learning processes in TVET which lead to competencies asked for in the (international) labor market.

Subsequently, let us look at two well-established games in education that exemplify why educational games are there to stay in TVET:

Example No. 1:

There is one classic game-like teaching method that accentuates the usefulness of gamification. It derives from the well-established scientific school of game theory: the so-called **prisoner dilemma**.

Applying this game in class, the teacher leaves the students with the following situation, and three options of action to be decided on in a team process. The students discuss and decide which route to take:

Prisoners' Dilemma Game as a Role Play:

Two inmates of a prison will have to face the charge of corruptibility before court.

The prosecutor offers the following deal to each on separate:

"If you testify against your accomplice, we'll set you free and you'll receive 100,000 \$ reward."

In fact, both have been corrupt and accepted 50,000 \$ each. Both believe that the police actually has no evidence, maybe they can prove culpable negligence when the order in question was taken by the two officers. Both inmates know the other one received the same offer.

The legal situation is like this:

- If both testify against one another, they both go to prison for a year and the deal offered is null and void.
- If only one testifies against the other, he will receive the 100,000 \$ reward and go free, while the other one goes to prison for a year.

- If nobody testifies, there is no further evidence and both go free—no reward however.

So the following event matrix ensues:

Scenario 1: Nobody testifies, both culprits go free	Scenario 3: A testifies, goes free and receives 50,000 \$, B goes to prison for a year 
Scenario 2: Both testify, A and B go to prison for a year each 	Scenario 4: B testifies, goes free and receives 50,000 \$, A goes to prison for a year 

Figure No. 17: The game “Prisoner’s Dilemma” for TVET

After the gaming phase, i. e. the two playing teams take their decisions independently, the teacher initiates the discussion and reflection of the outcome, highlighting the pros and cons of cooperative and non-cooperative behavior in business life. The potential that both players may retain their bribe money after both are released can also be discussed, as there is no crime that has been proved in that case. Also the role of trust in the game must be addressed.

Moreover, there are possibilities to discuss strategies and decision-making factors. But first and foremost, the **discussion phase is typically very communicative**—and rules of communication, respect and politeness as essential soft skills can be trained very effectively.

The options of the prisoners in that game demonstrate typical behavioral situations in work life. Because this is still a game in TVET, there is a great chance to acquire competencies to cope with “dead-serious situations” of a similar dilemma at work later in life, just as intricate and complicated as the prisoner’s dilemma.

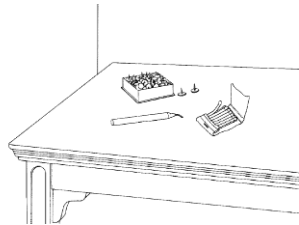
Example No. 2

This game is called Dunker's candle problem, named after an American psychologist. It is very expedient to encourage teamwork, cooperation, communication and creative thinking. Moreover, it promotes problem-solving skills to a large degree:

Dunker's Candle Group Problem-Solving Activity (Game-Based):

A group of four to six students is handed the following material:

- some matchsticks
- a candle
- a box of tacks.



The task given (or the problem to be solved) is to attach the candle safely to the wall. The solution is very straightforward; the candle goes into the box that carried the tacks and the box is attached to the pin board:



Something that does not come to one's mind immediately is to include the box as well. As the box is not mentioned as a part of the material and if students follow the instructions too closely, the attempt may end in failure. A variation could be to introduce time as a constraint as well.

Figure 18: The problem-solving game "Dunker's Problem"

As a matter of fact, soft skills as well as hard skills (such as technical thinking) can be addressed with this game.

A well-trained TVET teacher is able to make use of the motivational effect of such a game for future teaching purposes. Highlighting the importance of problem solving skills, creativity and ingenuity in life should not be difficult after such a game when continuing the teaching process.

Moreover, students can prove that they have improved their problem-solving capabilities in another game after that, or by means of solving a real case study taken from their field of work. Telling from experience, students will be very motivated for solving other problems after working on Dunker's problem.

5.7 Structured Learning Experiences: turning Special Events into learning incidents

5.7.1 The general framework of structured learning experiences

Structured Learning Experiences (SLE) are a powerful methodological concept to make use of special events that happen regularly in TVET. SLEs do not consist of a special set of separate teaching methods, but of a concept that can use a multitude of action-based and student-centered learning in TVET.

Pragmatic QTA Hint:

SLEs are an outstanding way of bringing the pedagogical principle of Experiential Learning to fruition in TVET.

Key QTA Insight No. 35:

The idea is to make use of special events in TVET, or simply put, to integrate a structured learning experience (SLE) into omnipresent and recurring training center events such as new year, intake, graduation celebrations or sports activities.

Technical and vocational training institutes have a long tradition in organizing special events for the students. The reasons why to do this has sometimes been lost to students and teachers alike in the mist of history, as the events are commonly not primarily seen as learning events. That is a major shortcoming, as there are no better learning possibilities in adult learning than self-organized events (cf. Knowles, Holton & Swanson 2015).

But what are such events in particular? Therefore, let us define omnipresent events first:

Omnipresent special events are training center-wide student and staff activities that are put into practice at least once a year. Commonplace examples are:

- Field and adventure trips
- Sports days/weeks
- New year or anniversary celebrations and special center events/festive days
- Open days
- New batch welcoming / convocation or graduation ceremonies
- Parent-teacher conferences
- Meetings with industry
- Career counseling days or “meet your potential employer” fairs.

There is a straightforward learning model behind the exploitation of special events for learning purposes for TVET students, materializing into four distinct phases (cf. Tappin 2014):

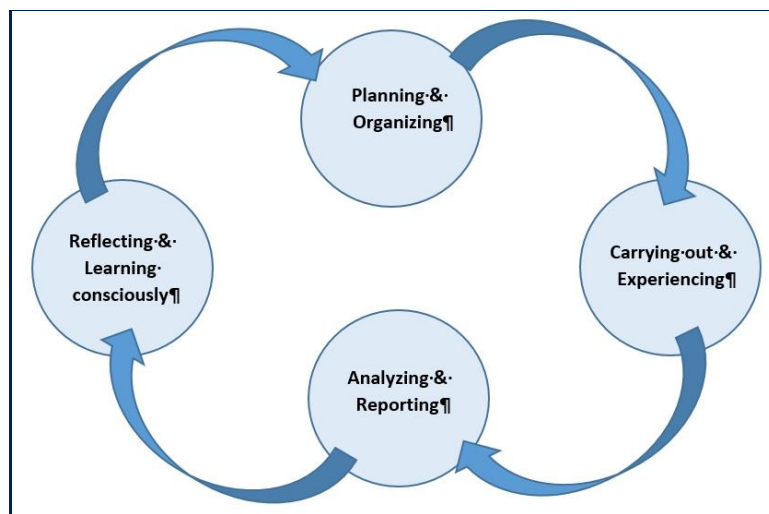


Figure 19: 4-phases learning model for SLEs

This model is an **updated version** of a structured learning experience (SLE),⁷ according to the modern **focus on the reflection phase** as a basic pillar of sustainable learning results. SLEs have the potential to evolve into substantial building blocks in training to create high-effect learning in TVET, and for adult learners in general (cf. Knowles et al. 2015).

⁷ “Updated version” because SLEs did not originally comprise a reflective phase as a training method, which is considered essential today. Also the planning phase was not obligatory, as the primary experience could come first.

Typical methodological examples for SLEs are:

- TVET special events, but also
- role plays
- simulations
- case studies
- educational games (cf. Ukens 2008 for further details)
- experiential exercises (such as rock climbing, dancing choreography, canoeing etc.).

The common characteristics of these training methods, beyond an adherence to the general principles of action-based, student-centered teaching and learning, are (cf. Biech 2009):

- Students complete a **coherent “cycle of action”**⁸ (Hacker 2015).
- Students develop **“good work habits”**, such as:
completing a goal, completing a task on time, observing budget limitations, taking on responsibility, making decisions wisely and appropriately and being aware of the concepts of accountability and transparency.
- Students build **self-esteem**.
- Students identify their **interests and skills/abilities**.
- Students work **independently** and act in **self-regulated** style.
- Students interact in **teams and social groups**, i. e. find disagreements, common ground and compromises and go through the **stages of team-building** (for the four stages: Forming – Storming – Norming – Performing, according to Tuckman & Jenson and in particular Egolf & Chester 2013).
- Students enhance their **communicative skills**, given the need to adapt to their peers and outside input constantly.
- Teachers act as **facilitators and technical experts**, counseling as a last-resort factor to turn to.
- Teacher give **feedback** at the very end of a process, i. e. during the reflection phase (but only after self-critical insights uttered by the students).

These learning experiences obtain the label “structured” because of a “rigid” adherence to the phase model, stressing the need for evaluating and particularly reflecting the process and the results. Modern learning theory even stresses the value of writing down the learners’ individual experiences and learning aspects to be judged worthwhile (by the learner) to remember, recall and use in future in “reflective learning instruments” (Boehner 2016).

Such instruments can be development portfolios, learning diaries or reflection booklets, in order to **solidify and structure learning in written style**, with the potential to get back to written entries some time later in formal learning settings. Therefore, a modern

⁸ “Cycle of action” describes an action that, much like job-based tasks at works, requires at least a planning, an executing and an evaluating stage, in order to act and remain successfully in a company. (For details see the TVET-relevant research being carried out in educational psychology, especially by W. Hacker 2015).

interpretation of SLEs refers not only to the clear-cut phase-based sequence, but also to the structured process of preserving and perpetuating experiential learning.

SLEs are surely not the latest hype of constructivist learning theory, which stipulates a more liberal and open approach to learning and teaching in TVET for adolescent and adult learners (cf. Juvova et al. 2015), but **proves to be highly efficient for students to delve into experiential learning**, especially if they are still in need of some scaffolding to hold on to.

The same is true for many teachers in TVET, as they may be technically minded and not sufficiently trained in student-activating methodology. The didactical principle of **scaffolding**, allowing the teacher to be more instructive and present at first, while fading ever more into the background and allowing students to work increasingly on their own and in a self-regulated way (see Boehner 2016), serves as a foundation for more self-organized and activity-based to come in terms of a learning theory in TVET.

The traditional model of SLEs is organized in four steps (CEFE 2012):

Orientation:

The teacher has to be clear about the envisaged learning objectives, i. e. some abilities or skills as sub-competencies such as the “ability to compromise” or the “skill to negotiate a deal with another team” etc.

Moreover, the learning objectives must be clearly communicated to the learners early on.

Instructions:

The teacher has to give concise and structured instructions during the initial plenary session about what is expected from the learners through the learning activity, usually by visualizing via projected slides and a handout.

Just in case that is not enough, the teacher clarifies by engaging with student teams while working.

Activity proper:

The teacher turns into a facilitator and councilor. In the best of worlds, the activity speaks for itself and the students work independently. Still, the teacher observes attentively and berates in case of major obstacles that cannot be solved without support or if the instructions were not self-explanatory or not completely grasped by the students.

If the activity consists of planning and carrying out a major event (such as new year’s celebrations or open days), supporting staff or fellow teachers should be part of a counselling team.

Processing questions:

The teacher should be ready to ask questions (to support self-regulated learning) if the learning process does not go according the SLE plan, in order to guide and help.

Moreover, the teacher’s questions are particularly important in the SLE’s reflection phase to foster in-depth learning.

These steps have been adapted to the four organizing phases of SLEs given above. The SLE steps used in former times, especially for the questions prepared during step four, rely on the theory of adult learners' learning styles. While it is still true that individuals may prove a bit more apt at and have preferences for acoustic, optical or haptic perception, **up-to-date neuronal and psychological research states that all of us learn by using all our senses**, i. e. the best learning environment is to provide an experience where learners can use all of their senses in different and self-styled variations (cf. Willingham et al. 2015).

That is why the traditional four-phase concept (CEFE 2012) of

- experiencing the activity
- publishing the solution(s) and data found
- analyzing and Interpreting the results as well as
- generalizing the findings

has been turned into the learning model presented in figure 19. That model also consists of four phases, but it proves to be more adapted to the up-to-date state of learning theory. It also serve to counter mounting criticism with respect to SLEs' rigidity.

Key QTA Insight No. 36:

The up-to-date version of SLEs emphasizes the need to reflect real-life experiences and to think about transfer options for learning effects. The theory of learning styles and the generalizing of findings have been relegated to irrelevance these days.

5.7.2 The four phases in SLEs in detail

In **teacher education**, the “easy-to-grasp” concept of structured learning experiences (SLEs) that comes in steps and relies on a phase-based learning model provides **a useful framework for teaching professionals to be**. It may **serve as an introduction into strictly student-centered and self-regulated learning and training**, as it gives guidelines to adhere to.

To provide a teacher's guide concerning the question what the phases are good for and in order to suggest pertinent questions asked in the different phases, the following section will equip the TVET teacher with **background knowledge about the objectives** of the four phases and a phase-based **arsenal of prototypical questions** that can be put forward to support learners engaged in SLEs.

At that point, teachers shall note that they must act as moderators and facilitators by asking questions at the end of SLEs that are to trigger ultimate learning insights during the reflection phase. Acting in the capacity of a technical expert should be a means of the last resort in SLEs, to foster an independent working and a research-minded attitude

(i. e. by not relying on the teacher or other people) about knowledge and skills not yet readily available.

The four phases for professionally implementing SLEs are to be interpreted as follows:

(a) Planning and organizing phase:

This phase is the first part of the learning cycle in SLEs, after the teacher has given instructions about the task ahead. It is important to provide students with all resources needed--or to let them find out where to get them--, in order to plan and organize the upcoming event. The teams start work at that point and step into the forming (getting to know one another) and norming (finding their roles and rules) stages of group work (according to Egolf & Chester 2013). That is why they need to be allocated sufficient time to overcome the subsequent storming stage (managing different opinions of how to operate) and enter into the decisive performing stage. During the performing stage the real planning activity finally starts, i. e. at least one hour before any serious work performance can be expected.

Before students are performing, they need to write a protocol of the previously executed planning stage and provide an organization plan as well as allocate jobs to be done. That should lead to a software-based schedule that is legible and presentable to outsiders.

If the teacher observes problems in the team effort, support is to be provided by asking the appropriate guiding question(s) to bring them along:

- Have all team members been involved?
- Do you have sufficient resources anticipated? (time, money, material)
- How exact is the planning and organization schedule timewise (Do you have a time cushion as well)?
- Do you have a soft copy, do you use planning software, tables etc.? (By the way, watch your format, language style, spelling etc.)
- Do you have distributed roles of participants clearly and distinctly?
- How realistic is your planning in terms of time, money and manpower needed? (maybe simulate beforehand?)
- Do you use any examples of prior planning and organizing schemes of similar events that have proved successful?
- Have you asked professionals/experts in the field?
- Did you do a proper web research on your subject?
- Does your plan look professional when it comes to layout?
- Would a third party be able to understand and work with your plan? (“litmus test”)

List of potential guiding questions during “planning & organizing”:

(b) Carrying out and experiencing phase

This phase is characterized by the primary experience of engaging in some event actively and should not be interfered with by the teacher, unless something goes “terribly wrong”, i. e. to a degree that it will be detrimental to outsiders and the institute’s reputation. Otherwise, the principle of learning by doing and even making mistakes takes precedence, and students should be left alone during the phase of carrying out their plans.

Pragmatic QTA Hint:

No teacher questions should be asked during the phase of experiencing the planning during the special event! Students work in a self-regulated fashion during SLEs.

Consequently, students will make real-life experiences to learn from.

(c) Analyzing and reporting phase

It is a mainstay of SLEs that after the phase of primary experience, the groups get together again and fathom the results. Ideally, the group members have agreed on a yardstick during the planning phase and do the number crunching accordingly. For example, a tea and cake stand during an Open Day may count the money earned and the cups of tea as well as pieces of cake sold, alongside the leftovers. Teachers should make sure that learners have a means of measuring their results, just like in business life. In addition, they will have to discuss their team effort and effectiveness. Last but not least, they have to attribute well thought through reasons to a certain level of success, both during and after the event. The group has to agree on a team vote regarding results. The agreement is to be put into a conscientious team report that can be graded by the teacher according to transparent criteria, such as form and spelling, output measurement, team stages, reasonable improvement ideas etc. Finally, the result of the analysis will be presented to the plenum. Every student and the teacher give feedback and fill out an observation sheet, to ask critical questions after presentations. That phase needs to last about three to five learning contact hours, excluding report writing which can be done at home.

By the way, presentations can also be marked if teachers want to and consider that beneficial for learning.

The following set of stimulus questions can be asked during the result analyzing group work if the teams get stuck:

- What are the reasons for your actions during the phase of experiencing the special event action?
- What are major differences between planning and the actual results, as unfolding during the event?
- What are reasons for final deviations from your plans?
- To what degree are students happy with their organization? (e. g. enough food and drinks, enough time, sufficient space in a food stand etc.)
- To what degree are you satisfied with the results of the event, compared to your objectives?
- How important are the results for you as an individual, and how much for your group?
- Were the group roles well distributed and did everybody fulfil the expectations?
- What would you have done differently with hindsight?
- What are your suggestions for next time to observe?

List of potential guiding questions during “analyzing & reporting”

(d) Reflecting and learning consciously

For sustainable competence gains, **this phase proves to be essential**. Learning theory has it that learners must consciously think about their primary experience, draw conclusions, support prior findings about themselves and ponder new findings, confirm strengths and be aware of weaknesses--and create a plan about how to redress issues. Moreover, students have to make future learning plans and must integrate that learning experience into their wider requirements of training and learning needs.

Finally, students should write their reflections down, discuss their entries (e. g. into a long-term development portfolio) with peers and teachers alike and come back to these entries after some later pertinent learning experiences.

Teachers must allow for sufficient time in that phase, at least 30 to 120 minutes, depending on the “grandeur” of the learning experience in the first place.

To steer a successful reflection session on learning experiences, teachers may ask the following questions, in case the students need support to progress. Experienced reflective learners will not that kind of guidance any more. But the “art of proper reflection needs training too.

- What is your major “lesson learned” from your experience?
- What was your major strength you made use of?
- What was a weakness that showed, and what are you going to do about it in future?
- What is your advice for further teamwork?
- How do you explain main deviations from your goals?
- By which means did you reach certain goals?
- What is it that you will make use of again?
- What do you think is going to be useful for any group member in future?
- What are the rules that make such events a success?
- What is your main discovery to make use of in your future career?
- What is going to be salient in work life?
- What have you learned about yourself and your behavior that was new to you or that surprised you?
- How can you transfer your experiences to your future (work and private) life?

List of potential guiding questions during “reflecting & learning consciously”

Pragmatic QTA Hint about SLE phases:

SLEs always undergo the four defined phases of the learning cycle. Leaving out one phase cuts short the learning experience and results in less relevant competence acquisition.

Evidently, the **example questions provided for a skillful moderator and teacher of the SLE process are only guiding questions and have to be fine-tuned according to learning circumstances**, i. e. to what students actually need and what they cannot come up with on their own.

These learning support questions are only incentives for students to think ahead and become more independent.

The role of the TVET teacher in SLEs:

The teacher is always important, no matter how self-organized and self-regulated a learning process comes across. Even in a setting where students work largely independently, the teacher has to do the preparatory planning, give instructions, counsel as a technical expert, supervise and ensure the learning process takes place. Ultimately, the teacher also assess competence development.

In brief, the teacher has to perform the following main tasks during SLEs:

- (1) Link experience to curriculum and other workshop/classroom training
- (2) Select and approve an appropriate worksite for the student teams
- (3) Provide or provide access to the resources needed to complete the task
- (4) Provide clear work instructions, oral and written style
- (5) Clarify team goals and help rank objectives
- (6) Oversee the entire process and correct deviations
- (7) Provide technical input if needed
- (8) Coordinate co-trainers if available
- (9) Continuous supervision as a critical friend and moderator
- (10) Initiate and steer student processes of analysis and reflection
- (11) Insist on written statements of learning results from individual students
- (12) Provide formative assessment by giving feedback whether and to what degree teams are on track, as well as whether is room for improvement
- (13) Provide summative assessment, e. g. a written SLE team report can be assessed according to criteria agreed on before the SLE
- (14) Discuss competence progress and improvement with students as well as potentials
- (15) Provide ideas for transferring acquired or reaffirmed skills and abilities

Besides, there are numerous other tasks for the teacher, such as preparing, accompanying and evaluating the learning process. However, the 15 main tasks given above are focal points of teacher actions in SLE and need to be performed highly professional.

The requirement of successful team work in SLE:

SLEs are team experiences at all times, as soft skills and work-related abilities are always acquired in coordination with and adjusting to other human beings. Teachers can do their bit to make the experience more effective for learning in TVET.

(1) How to pick a team?

That depends on the group of learners to be involved in SLEs. The most effective teams have no more than six members. Ask each team member to take on a specific role, i. e. note taker, communication officer, contact person to other teams, organization chief, executive officer, time and restraints watcher etc. (for further details see Borich 2010)

- (a) **Inclination groups:** If the teacher does not know the group, it is advisable to let the students pick their own team members, to avoid personal antipathy and subliminal pre-existing problems in the group.
- (b) **Heterogeneous groups:** If the teacher knows strong learners, they can be made team leaders to have others benefit from deeper insights. Strong learners benefit from their leading position as well! (cf. Brandler & Roman

2015). Or make a continuum about how much they know already about the task at hand, then group a self-proclaimed expert with a novice and put two or three teams together.

- (c) **Homogeneous groups:** If the SLE contains tasks of different levels of difficulty, teachers can put high and low performers as well as average students into separate teams, and then distribute tasks accordingly. That would mean for the organization of an open day, for example: overall organizing responsibility to high performers, organizing a food and drink stall to low performers and organizing an information booth for parents to average students.
- (d) **Random Groups:** If there are no different levels of tasks and the teacher sees no need to have team leader that is able to perform at a higher level, no student stratification is needed and random team grouping is possible. It is meaningful whenever a group of learners is without major interpersonal disputes to mingle students and mix them into different groupings to boost their ability to adapt to different personalities. When it comes to methods to do random grouping, they should be considered fair and truly coincidental.

Pragmatic QTA Hint: Random grouping methods

The methods of selecting groups randomly should be fun and add to the soft skills learning experience via teamwork:

- hand out game cards or paper shreds with matching images
- imagine a map of the country (or the world) and match students that were born the farthest apart (or the closest)
- attach colored dots on a handout and match the blues/reds/blacks etc.
- hand out playing cards and match jokers/kings/tens etc.
- alphabetical order of last name
- favorite food match
- match students that have their birthdays closest to one another
- distance traveled during last holiday (most mileage put together)
- students who are the most or the least alike (e. g. on the basis of hobbies etc.),
- for pairs: a pack of socks to find the “partner” is a funny alternative .

(2) How to make a team most effective?

Aside from the team number and the roles attributed to each team member, and to avoid so-called “social bums” that let others do all group work, it is good to know a framework of effective team work.

There are many models in place, and there is no agreement in psychology and learning theory when a team is most effective. But it is still important to **know the factors influencing team effectiveness**.

The model of Driskel, Hogan and Salas (1987) is easily accessible and provides TVET teachers with a theoretical framework what to observe and what to foster during team work in SLEs:

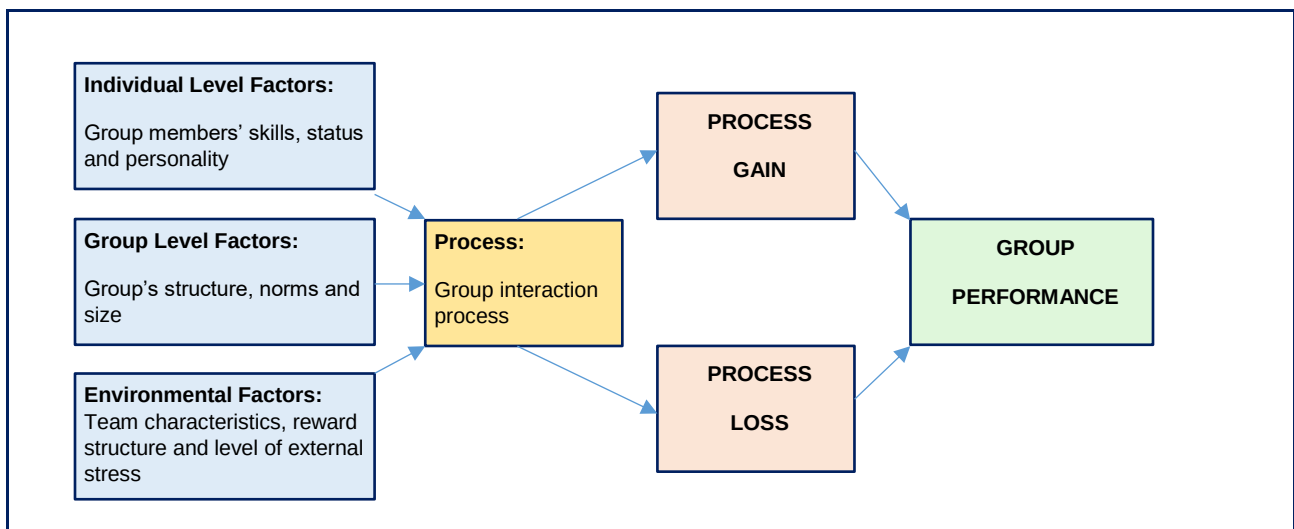


Figure 20: Team effectiveness according to Driskell et al. (1987)

The input factors of group members and group level can be decisively influenced via a particular group selection process. The environmental factors must be controlled by a level of difficulty that is demanding but still manageable by the students. The reward should be the successful event, but needs to be highlighted by the teacher beforehand. Stress factors cannot be excluded and will be part of the SLE, to be reflected afterwards.

The interaction process is the major experience of SLEs, i. e. the group interaction in the planning phase (during which the teacher can supervise, moderate, steer and give input) and the interactions during the executing phase (which can hardly be influenced by the teacher). It is an important insight of this model that data, information and effectiveness may be lost during the process of interaction--and any loss incurred must be part of the analyzing and reflective learning process after the primary experience.

Finally, the outcome of performance has to be measured by some gauge agreed on in teams. Then the outcome is analyzed and critically reflected to learn from the SLE and to enhance team skills in particular. For that reason shortcomings as well as highlights during the interaction within teams have to be pointed out, both during the phases of planning and carrying out.

Essence of “why SLEs”?

SLEs exist to make use of special events in TVET and to employ student-centered methodology in authentic situations. They allow technical and work-related learning in a natural or at least simulated setting and enable the teacher to focus on soft skills, as team work is essential and competencies needed at work are at the core of the approach. Important examples are time- and resources management, effective communication, decision making and compromising as well as team management. Moreover, the outcome of SLEs can be measured, analyzed and reflected; self-reflection is continuously encouraged.

Even though the phases, the processes and the experience can well be fun, SLEs follow a structure and are learning events through and through—and should always be treated as such by TVET centers and colleges as well as teachers.

SLEs are mainstays of the experiential learning principle and make learning by reflected doing possible. It is an essential feature of learning processes, particularly beyond the age of 16 when adult learning starts off. The main idea of experiential training via SLEs is to let students feel that learning takes place as well as think it through, to make them try out new behavior and new emotional as well as cognitive responses. SLEs are most effective in changing student's attitudes and self-confidence towards successful work and in developing interpersonal skills, urgently asked for in the modern labor market.

To provide **support in organizing SLEs**, an extensive example is made available, containing valuable hints for teachers and step by step:

Structured Learning Experiences (SLEs): EXAMPLE

New Year or anniversary celebrations and special events / festive days or Sports Days / Weeks

To make use of regular special events in TVET institutes, teachers need to follow consecutive steps to turn the event into a meaningful learning experience:

Step 1:

Brainstorming with the group of learners:

“What needs to be done to make the festivity a success?”

The list of tasks to be completed are collected on a BOARD (blackboard, whiteboard, pinboard, notice board etc.), to bring them to the attention of everybody.

Of course, the training provider should have a list, compiled during a staff meeting, what needs to be done already, but the teacher only brings in these issues if they do not come up during the brainstorming session. In particular, bring in SAFETY issues, if not properly addressed.)

Step 2:

Distribution of TASKS and TEAM formation:

“Who does what?”

The responsibilities will be distributed and posted at the BOARD.

Certain times and dates of reporting back to the teacher will be agreed on!

(It is the most important job of the teacher to supervise the process and make sure ends are met to make the event a success story. The teams need a place and sufficient time to prepare in project-like settings.)

Step 3:

Event Preparation Meeting:

“Each group reports back to the plenary meeting what is planned and how it will be done during the event, and if so, what is still needed!”

The list of tasks on the BOARD will be checked!

(The teacher oversees the presentation, provides feedback and supports.)

Step 4:

The TEAMS perform their duties at the festivity and carry out their planning.

“Is everything working according to plan, are any on-the-job adjustments needed?”

The students ask for feedback from their customers!

(The teachers oversee the smooth running of the event and the teams’ tasks; they support if a need arises and take notes to give feedback thereafter.)

Step 5:

Feedback session:

“Did everything work out according to plan?”

After having cleaned up and redone the facilities, the teams meet again and give each other feedback, draw a conclusion on the degree of achievement and prepare a feedback presentation for the other groups. (time span to be allocated: at least two hours)

(Teachers guide and support feedback sessions and add a third perspective.)

Step 6:

Presentation and Group Reflection:

“What is the degree of satisfaction, what is the evidence for success and what do other groups think? What is the experience relevant for (work) life?”

Team presentations are given (at least 10 minutes for each group); the other teams provide feedback and the entire group surmises and expatiates on what the experience has taught them for future life.

(The teacher supports the critical and reflective processes.)

Step 7:

Individual Reflection:

“What is the experience’s worth for me, what have I learned and what is it potentially good for in my future (work) life?”

The students prepare a written entry for their learner’s PORTFOLIO (time span: at least 30 minutes).

(The teacher supervises the calm and reflective atmosphere and supports individual reflection processes, if asked to, highlighting the acquisition of technical and soft skills.)

Pragmatic QTA Hints for the teacher:

- (1) Plan sufficient time for each step and be in charge of safety measures during the event.
- (2) Think about the resources needed for the event and see what funding is needed and available from the center and/or external sources.
- (3) Support students and teams with their planning and encourage a research-minded attitude as well as creative and imaginative approaches.
- (4) Be motivated yourself and highlight that “everybody wants to look great” to outsiders during the event.
- (5) Check your curriculum for competencies that your students can learn via the planned SLE, especially in terms of technical and soft skills—adapt your training / lesson plans accordingly.
- (6) Be open-minded and adapt your new role as a teacher in the background—and remain in the background, watching, facilitating, supporting if truly needed, guiding and encouraging!

The newish learning experience of a SLE will be great fun for the teacher too. Training institute festivities, especially for a new year or sports events, have the potential to be formidable technical and soft skill learning experiences for students. That has to be made use of for modern training.

Chapter 6: Implementing good teaching via diverse methodology

6.1 Structuring teaching methods

There is a **myriad of teaching methods available**, and as many methodology guidebooks, booklets on smart methods or fully-blown textbooks on inventive and, or so it is usually being claimed, trendsetting methodology (cf. Boehner 2015).

In any case, it is advisable for any teacher to regularly consult a comprehensible compendium to **broaden the own horizon in terms of teaching methods**. From a large literature base, the following titles are recommended by the author, based on own experiences, colleagues' advice and reference to research:

- (1) Borich (2016): Effective Teaching Methods: Research-Based Practice.
- (2) Burden & Byrd (2015): Methods for Effective Teaching. Meeting the Needs of All Students.
- (3) Kauchak & Eggen (2010): Learning and Teaching: Research-Based Methods.

Pragmatic QTA Hint:

Just type the key word "Teaching Methods" into educational databases such <https://eric.ed.gov> (in English) or <https://ibdocs.ibo.org/research> (in English) or www.fis-bildung.de (mostly in German), and you will literally find **thousands of articles, books and some anthology chapters of teaching methodology**. To master such an imbroglio, it makes sense to build up one's **own repertoire of teaching methods**, step by step, testing them and collecting material. However, such a repertoire should always live up to the postulations laid down in this book for the challenges of TVET in the 21st century.

It is not the intention of this book to replicate a comprehensive approach that aims at introducing as many methods as possible. Instead, the **focus is on some easy to imitate and effective methods**, ready-made for TVET.

In doing so, this section on concrete teaching methods follows one of the major principles of learning in TEVT, exemplary learning, i. e. you learn best by devouring some exemplary methods that a teacher inclined on professional development may explore in practical application as well. That is the course to follow. **Additional modern methodology can then be added easily**, e. g. by looking into relevant publications or online resources introduced above, or simply by a professional exchange amongst colleagues.

As pointed out in the last chapter on establishing essential pedagogic principles in TVET, there is no rationale for holding on to **backwards-looking methods** on a large scale, e. g.

- **traditional teacher-centered lectures or**
- **illustrated talks.**

These two methods may be **adequate during short input sessions**, as required by the student body as a whole to proceed with their tasks and problems, but should **never last longer than 20 minutes** or so. Even better is a timing of 10 to 15 minutes.

These teacher-centered methods should be impromptu and short teacher actions, answering to basic problems of understanding on the students' side, instead of a deeply-engrained structural methodological design feature of TVET sessions. Nonetheless, TVET teachers must still command over a great pool of technical knowledge to fill in blanks for students *ad lib*, without planning or preparation to iron out hurdles to self-regulated learning.

When it comes to the usage of lectures and illustrated talks, see the section of the “Flipped Classroom” in the previous chapter, to understand the transformed role of such methods in TVET.

Teachers might want to consider **contemplative methodology** as an opposite pole to such traditional methodology (cf. Barbezat & Bush 2014), in order to develop a notion for **a seismic shift in modern methodology** and what is possible these days:

- **Job-Meditation**, i. e. quietly musing about job requirements or learning experiences
- **Job-Yoga** exercises, including focusing on different movements needed for a specific trade and mimicking them in slow motion as a group
- **Deep listening**, e. g. internalizing interviews with superiors, customers etc. by devouring every word
- **Contemplative Writing**, e. g. making use of all varieties of reflective instruments introduced in Chapter 8
- **Job-Pilgrimage**, especially site visits, such as exploring tasks of companies or construction sites using pre-arranged observation sheets, or field visits, such as interview and survey tasks of potential customers or visiting subcontractors, component suppliers, questioning retail traders and exploring shops etc.

Such methods are innovative and effective elements of modern TVET classroom or workshop settings, adored by students and delivering long-lasting memories--and as a result enhanced learning results.

This textbook is not going to contribute to the piecemeal and unsystematic mess found in many other publications on teaching methods, the following illustration shall provide a **precise classification of teaching and learning methods** as well as when and how to apply them:

Mega-Methods:

These are methods that organize and determine a teaching and learning process over **many direct contact hours** inside and outside of the classroom or workshop. In extreme cases, entire modules or courses are carried by one teaching method, with the project method being the most pronounced example. Mega-methods can last from entire semesters or various weeks to a few contact hours, down to a minimum about 180 minutes.

Meso-Methods:

These are methods that **design several direct contact hours and a number of lessons or practicals**, but they do not last for weeks or even longer. A typical example may be a simulation or a web quest that lasts from about 45 to 180 minutes.

Mini-Methods:

These methods **shape up to one lesson or practical**, mostly in combination with another mini-method or a few micro-methods. Again, a typical example could be a web-based research assignment or a case study of average length, i. e. 45 to 60 minutes.

Micro-Methods:

Micro-methods are important in creating curiosity and motivation or for arranging work during different phases and **typically last from 5 to 30 minutes**. There are scores of micro-methods, and innovative educators are still busy coming up with new ones, which is a good thing and beneficial to learning diversity. However, it is easy to lose track of new developments, so continuous teacher training—and to keep an eye open as well as professional curiosity—is unavoidable to update the own repertoire.

Figure 21: Classification of methods of teaching and learning

The classification given above is truly practical in the sense of depending on what time segment teachers intend to plan, and what purpose a teaching method is needed for.

Among the mini-methods and micro-methods, another differentiation is possible too: the phase of teaching to be designed (e. g. student self-regulated work phase, motivation phase or presentation phase).

Pragmatic QTA Hint regarding teaching methods:

Professional teachers in TVET start early in their career to keep a **little box containing note cards—or a soft copy file—that describe specific teaching methods**, most effectively in bullet point form and process-based. The order of methods can be as follows:

Mega-, Meso-, Mini- and Micro-Methods.

That can be added to and knows no restrictions as to purpose of methods.

Of course, modern e-based solutions may be more suitable for the digitally literate teacher of today.

The clear objective is to enrich teaching planning, forever!

Pragmatic QTA Hint: The Myth of the Learning Styles

Decades of teachers training have taught theories of different learning styles, explaining different learning results. The most common distinction is probably between

- the visual learner
- the auditory learner
- the read/write learner
- the kinesthetic learner.

Some other theories refer to cognitive processing in learning or social interaction components. These other theories overlap starkly with the concepts of intelligence and personality that also explain differences in learning results.

Generally speaking, the theory of learning styles, determining the usage of teaching methodology according to personal needs **should be relegated to the realm of myth**, as **all human being learn with all their senses**. That means we are all visual, auditory, read/write and kinesthetic learners at the same time. Individuals may have different preferences or may be used to one particular channel more than the other.

Still the upshot should not be treating every learner differently according to individual learning styles, but offering open and student-centered methodology that allows all students to evolve and flower out, in their own self-styled speed and approach.

In a nutshell, the myth of learning styles does not determine teaching methodology (cf. Guterl 2013)!

6.2 Group Work and the wider social arrangement of teaching and learning

To do group work is no end in itself, to do away with one of the modern rumors in TVET. Instead, there must be **a clear-cut target** for that. Most methods in TVET can actually be implemented by four different basic settings of social learning interaction:

- **working alone**
- **pair work**
- **groups of 3 to 6 students**
- **plenary work.**

Research on the teamwork shows that groups larger than 6 participants become ineffective and invite taking advantage of others by slouching about.

QTA Key Insight No. 37:

If you want to see effective team work, **restrict the number of team members to a maximum of six**, to avoid dawdling around by some group members.

Moreover, lolling about is also induced if some group members feel they have no role to fulfil. That feeling can become overwhelming in case there is one outstanding team member, essentially doing all work proper (cf. Wong et al. 2014). That is why clear roles must be allocated in teamwork. These team **roles can functional or organizational in nature**, e. g.

- (1) **Functional team roles:** Process Manager, Quality Control Manager, Sales Manager (i. e. selling the outcome to fellow students and teacher during discussions and presentations), Communication Manager, Marketing Manager (i. e. marketing the own product to other groups and the teacher), Human Resources Manager (i. e. supervising the performance and goal-achieving of team members) etc.
- (2) **Organizational team roles:** Process Supervisor, Time Guardian, Team Leader, Minute Taker, Goal Promotor and Supervisor, Teacher Communicator (i. e. interface group to teacher), Team Mediator to fellow teams, Presenter etc.

QTA Key Insight No. 38:

In order to avoid “social lolling about” by individual group members that feel redundant or unwanted, **group functional or organizational roles should be distributed**, each role equipped with certain right and obligations. These roles can be “awarded” by the teacher. Instead that role-giving should be left to more mature and experienced students in terms of teamwork whenever possible.

In any case, teamwork efficiency must be continuously enhanced. For that purpose, teachers need to discuss the **phases of typical group learning** and prepare for conflicts or reflect such intra-group conflicts respectively (cf. Egolf 2013):

- **Forming**--the building of a team structure
- **Storming**--weathering first deviating opinions and conflicts)
- **Norming**--establishing working rules and regulations of teamwork
- **Performing**--real goal-oriented and rewarding teamwork going on
- **Adjourning**--determining the achievement of a final goal and dissolution of the team.

The norming phase can be supported by the teacher by establishing general rules of successful teamwork, in conjunction with the entire group of learners.

How to make all team phases work and how to integrate as individuals in teams, and ultimately reap the fruits of synergy, is extremely important for the success of companies. Teachers should point out this fact in announcing teamwork activities. Obviously, communication processes have to be streamlined and personally insulting or offensive comments prevented as well the ability to accept “constructive criticism” and compromise fostered (for details, cf. Lakey 2010).

QTA Key Insight No. 39:

From time to time, effective teacher broach the issue of **necessary competencies to make team efforts work**, such as communicative and negotiation skills in addition to the personal skills one needs to deal with well-intended criticism and the imperative nature of compromise. That can be done in a plenary session as a discussion, but also generally supported by reflective learning, i. e. by means of entries into written instruments of reflection to mull over own team skills.

There are two more important distinctions in group work to heed:

- (1) **Heterogeneous Groups:** These groups consist of students at diverging levels of competence that have been grouped together to benefit from one another, i. e. using the so-called **Student-Teaching Method** (also called: **Helping Method**) during which an advanced student helps less advanced peers and explains.
- (2) **Homogeneous Groups:** Students are grouped into teams of roughly the same abilities. That can facilitate interaction and speed up results in better teams. Moreover; students feel at ease with one another.

For both ways to group students there are good reasons, such as using the Student-Teaching Method or allowing progress at different speeds, depending on the team task to perform at hand.

The second distinction is equally important:

- (1) **Differentiated Group Work:** This means that different groups get tasks of varying levels of difficulty, i. e. a highly able group might get a tricky authentic work problem, while a less able group a routine work task to explore and fulfil. **Differentiated group work goes well together with homogeneous grouping**, but not necessarily. Sometimes the level of difficulty can be the same, but the groups get just deviating tasks in terms of topics, e. g. to cover more of the curriculum. Different case studies are typical examples for differentiated group work.
- (2) **Same-topic Group Work:** All groups work on the same task or work problem, and can in the end compare their results and their approaches.

Again, whether or not to differentiate group tasks depends on the group of learners. Mostly, **differentiated group work** has been promoted **for mixed-ability classrooms that are grouped homogeneously** into sub-groups. But there are many other reasons for deciding for or against differentiated group work, such as social issues how to group students, e. g. boys-girls groups, age-related groups, curriculum needs, cooperation problems of certain students or simply the intention to teach certain soft skills.

QTA Key Insight No. 40:

When preparing group work, teachers always have to make decisions on:

- **heterogeneous or homogeneous** grouping
- **differentiated or non-differentiated** work tasks/problems,

depending on teaching objectives, student abilities and learner group composition.

6.3 Archetypical mega-methods of teaching and learning

This section will concisely introduce and suggest three vintage methods of teaching in TVET that **mold the entire teaching and learning process over a longer period of time**, spelling out distinct expectations and roles for teachers and students.

These mega-methods have been around for a long time in pedagogy, but as methodology does not strive to reinvent the wheel, **a modern potpourri of methods that is student-centered and action-driven may well be eclectic in nature**, but must comply with the challenge to train effectively for a demanding world of work.

That is the case with the three following selected methods in TVET.

6.3.1 The Project method

The project method goes back more than a hundred years to William Kilpatrick and John Dewey and has been around in education ever since, with mixed results. The reason for sometimes less-than-optimum results is a total misunderstanding on the side of educators, devising project weeks at the end of a course of schooling year, or even coming up with topics that have nothing to do with the curriculum to promote cross-curricular competencies. These intentions may be **as laudable as they are misguided**.

Projects should be center stage in the teaching and learning process, and constitute the major vehicle to implement the curriculum, in full. If that is not possible, projects are not the right method of choice. In TVET, however, projects are often very handy, sometimes even advisable, as the project method has been crowned “king of action-driven and student-centered learning” (Wurdinger 2016), since each phase requires a high degree of student self-organization and responsibility as well as team-orientation. **The goal-oriented product that is expected to steer the process sits well with competence-based learning.**

Generally, projects comprise the following phases to be implemented during the teaching process:

1. Project initiation

In the best of all worlds, the students are familiar with the curriculum and collect project proposals. An idea for a project must be carefully examined to find out whether or not it benefits competence development according to the curriculum. If the teacher agrees or amends the project, a student decision making team, counseled by the teacher, will make clear if the project can realistically be completed, given the restraints of time and resources. Students are grouped according to their interests—the teacher can intervene and match students also with regard to their capabilities (homogeneous or heterogeneous grouping). During that stage the relevant criteria of assessment must also be declared, ideally by mutual understanding.

In the end, there should be a weighing of interests between students and teacher.

Phase 2: Project planning

At the beginning of this phase, the entire group agrees on organizational conditions, determines if any budget is needed or what resources are required.

Phase 3: Goals and Jobs

Concrete goals are worked out; how to reach the goals is operationalized in a work and task schedule. The team members obtain their roles and jobs to carry out that spur new competencies, i. e. even the best speaker is never going to do the presentation alone. All students shall have learning opportunities.

The work schedule is drafted in a somewhat flexible style so that exploratory actions can be carried out and unexpected as well as enhanced results are allowed for.

Phase 4: Implementation and Exploration as a Project's Core

In terms of time needed that is by far the longest phase. It may well be interrupted by interim presentations with respect to the state of affairs or plenary discussion how to proceed in long-term products.

Implementation does not mean sticking slavishly to the original schedule, but to establish ever-better work procedures, improve and learn as well as benefit from accumulated group abilities, creativity and ideas. The phase should be fun as well.

The teacher's role is an expert of the last resort and a benevolent counselor. Otherwise, teachers observe attentively for potential counseling needs, but also for continuous assessment.

Phase 5: Finalization of Project Work

There are three possibilities how project work can come to an end:

- (a) **Producing a product** (e. g. an electric engine model, a role play of a customer complaint, a brochure of a work procedure, a video for uploading, an advertisement poster etc.)
- (b) **Time is up** and the group decides how to present an interim product
- (c) The project has **changed the teaching plan and proceedings** completely. After that teaching will continue with new procedures established during the project (i. e. continuing to improve and optimize the produced electric engine model).

Phase 6: Plenary Discussion

The project's products, success stories, failures and consequences are uttered, talked over, and agreements are made how to continue with the project's results—and how to use it afterwards in the continuing learning process.

Phase 7: Metacognition and Reflection

This phase consists of two parts:

- (1) **Team Reflection:** This is when the group gets together a last time and reflects upon their goal achievement and what could have been done better as well as what can be repeated in future. The insights should be written down—and handed over to each team member.
- (2) **Individual Reflection:** After this, each individual team member leans back, and jots down own lessons learned, in terms of hard skills and soft skills.

There are three essential pedagogical features of a TVET project:

- (1) **Student-centered action**
- (2) **Real life and work orientation**
- (3) **Product focus.**

Typical project topics mirror competencies in the curricula, i. e. agreeing on products that allow for the acquisition of relevant competencies through project work (e. g. a typical topic might be: “Constructing an air-conditioning system from scratch and installing it in our classroom”, “Come up with an efficient storage system of medicine and drugs in a hospital” or “Establishing a new digital system how to write and control invoices”).

As a side product, key competencies are also brought ahead, in particular team and communication skills. Self-confidence and the ability to compromise will be boosted as well.

6.3.2 The Experiment method

Deriving from the realm of technology and science teaching with a physics or a chemistry background, teachers can make use of “twisted experiments” that hold sway in many areas of TVET.

The **experiment method is based on inquiry- and discovery learning**. In order to do it properly students must be reasonably mature, as it involves handling delicate affairs or even materials most of the time.

There is one major difference between experiments based on natural sciences on the one hand and social sciences on the other. The former usually bring together different elements or assemble different parts and look for some reaction while the latter make people do something and observe the participants' behavior and performance. But no matter which variety, **experiments are always hands-on** and primary experiences.

Frequently, teachers do not understand how experiment-based teaching is executed and how typical topics for experiments look like in TVET. From experience, we usually remember school experiments in chemistry, such as making *niter explode* or *mixing acids and bases to get a certain pH-value* or doing the renowned *litmus test*.

To provide examples for typical TVET experiments, four student tasks that employ the experiment method are introduced. The examples come from very different trades and make ideas available for teachers to apply the experiment method in their fields:

- (1) **Automotive of Air-conditioning/Heating Sector:** “You are equipped with lots of material and a toolbox. Make use of whatever you like and produce an engine (or an AC/Heating system) that works. You will check if your product works publicly.” Time frame: 8 hours.
Topic of Experiment: Does the engine work?
- (2) **Health Sector:** “You find out what nurses can actually do. Ask them to mix a certain medicine, providing the chemical substances that the medicine consists of. Is the medicine properly put together?” Time frame: 4 hours.
Topic of Experiment: Do we get a potent drug?
- (3) **Tourism Sector:** “You carry out a role play involving six guests in a restaurant that are being asked by waiters what they want. The waiters do not have a note pad at hand—and are asked afterwards what exactly the customers wants. How much can be reproduced adequately?” Time frame: 3 hours.
Topic of Experiment: How much information can a waiter cope with?
- (4) **Hair & Beauty Sector:** “You perform a role play involving a customer that is very unhappy with the result of her or his treatment, with the reaction being totally unexpected by the trainee. See how the trainee is handling the conflict. Is that being done well?” Time frame: 2 hours.
Experiment Topic: Can the conflict be solved?

The **creative teacher** can easily create experiments in each field of technical and vocational teaching to make students engage in experimental settings that expect technical expertise but also an inquiry-based attitude.

Practical QTA Hint:

Ideally, **creating experimental settings** in the own realm of teaching should be a requirement in initial teacher training already.

Typical characteristics of experiment-based teaching are:

- direct work life relevance
- unknown results
- unexpected parts for learners
- experiment setting to be created
- results are to be observed
- reasons for observed results to be found out
- lessons learned for the future to be documented
- reflective written note for individual learning effects indispensable.

The following sequence is meaningful in experiment-based teaching:

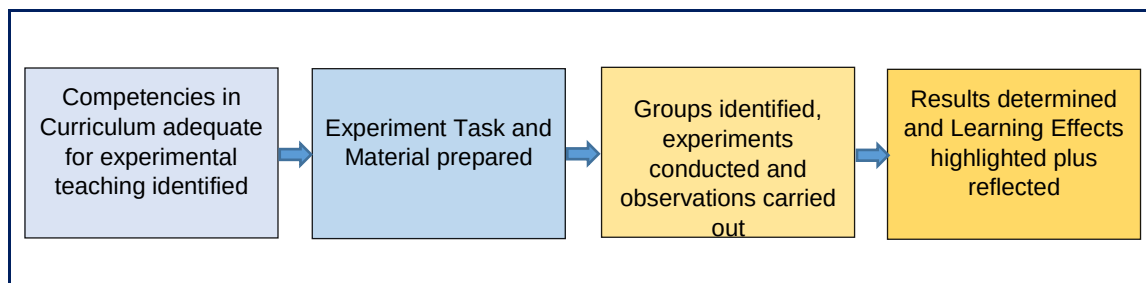


Figure 22: Sequence of teaching-learning action in experiments

Experiments are a highly effective teaching methodical arrangements, creating **eureka effects** as regards learning effects and potential problematic experiences at work. **The experiment methods also furthers extremely important soft skills such as an inquisitive attitude, curiosity and observation skills.** A well-done experiment, including preparation and after-experiment reflection, comprises at least six hours of teaching contact hours, if the results are used for deeper learning, for example via plenary discussions about consequences and nuanced observations.

6.3.3 The Simulation method

A simulation is a very suitable method in TVET if a real-life work situation cannot be mustered, which is generally the case in training colleges and centers. Even a fully-equipped workshop is not comparable to a company in which everyday tasks and problems naturally pop up and have to be addressed.

That is why any learning activity, even in a technical workshop, has to be embedded in a work-life context, i. e. into surrounding conditions of work that are comprehensible for and meaningful to students.

A work action that is coupled with created but fairly authentic real-life working conditions is called a simulation, if it is not taking place in real companies or in actual work situations, such as a customer order in a student-run training company. As it is laborious to create such a real-life situation in training, good simulations should span several hours of teaching and learning.

QTA Key Insight No. 41:

The main features of the simulation method are:

- real-life work activities are created as best as possible
- real-life surrounding conditions are simulated (such as time schedules, customer orders or complaints, supervisor instructions, colleagues' input needed etc.).

Pragmatic QiF Hint:

Even though good simulations have by no means to be computer-based, there is a plethora of online and computer-supported simulations for training. They originate in so-called *Business Simulations* for the commerce sector, but these days there are many elaborate simulations for technical occupations and the health and tourism sectors as well. Sometimes they are cloud-based and can be accessed via the Internet any time and any place, i. e. making simulations adequate to work on homework- and self-study-based too.

See for an example how to implement simulations and for soft skills training in areas such as strategic change, business-life acumen and collaboration: cf. Hall (2014).

For a sector-specific and elaborate example, see Jeffries (2012) for nursing training.

General non computer-based games, applicable to all sectors, can be found in: Bicheno (2014).

It has to be borne in mind that the development of sophisticated simulations in TVET takes a lot of time and brain power. As a consequence, it makes sense to screen the field for existing ones, or else **work out sector-specific simulations as a group effort amongst colleagues, for example during a further education session.**

6.4 Meso-methods of teaching and learning

Meso-methods typically determine and design one or two teacher-student contact events, with some self-organized self-study in between and afterwards. They emphasize work problems that can be solved with reasonable time allocated, i. e. they are generally not very complex in nature but no routine task either. They also require some pre-existing abilities on the students' side when it comes to self-regulated and self-organized learning. For a group of learners that is not sufficiently confident yet, micro-methods and mini-methods should be used instead.

Below, three typical meso-methods of teaching and learning that have great relevance for TVET are examined.

6.4.1 Web Quest method

Contrary to its name, the method does not allow for free-wheeling web searches, but **follows a more or less strict schedule provided by the teacher**, who hands out a list of sources to consult or even gives access to a restricted learning platform, harboring relevant material to be researched.

The aim of the web quest method is to solve some research-like questions by collecting and devouring information, explanations, demonstrations, flow charts and much more, ultimately to answer some practically relevant work problem.

The web quest method is best explained by providing two examples, the first one from the **welding trade**, the second from **ICT training**:

Example 1: Web quest task for Welding students

“Work Problem: A customer is the owner an old beautifully ornamented metal gate, but there are several problems with the joints (see picture attached). Please suggest what method works best to weld the material together again!

To answer that question, please search the following URL for solutions:

- (1) Search *Youtube.com* for demonstrations of different arc welding methods—and conclude afterwards which one works best.
- (2) Find a webpage on Soldering (not Wikipedia!) from some association or technical school, and argue why soldering may not live up to the requirements.
- (3) Find a tutorial on the differences between arc welding methods. Then prepare an explanation to the customer how you are going to solve the problems.
- (4) In the end, you will train your fellow students and present the selected arc welding method in the workshop.”

Example 2: Web quest task for ICT students

“Work Problem: Your boss wants you to create a powerful new database for her customers. She suggests using Microsoft Excel. You think Microsoft Access is the far better option. How can you convince her?”

- (1) Check the website <https://www.techwalla.com/articles/how-to-use-a-microsoft-access-program> on how to use MS Access first.
- (2) Then watch the tutorial on: <https://www.microsoftaccessexpert.com/Microsoft-Access.aspx>
- (3) Finally, check out Microsoft’s homepage and collect advantages of MS Access.
- (4) Find a critical stance on MS Access and figure out why it may not be very user-friendly for your boss.
- (5) Ultimately, create a sample database for ten imaginary customers to prove your point to your boss, based on what you have learned during your web quest.”

For effective usage of the web quest method, teachers have to ensure steady access to the Internet, or ask students to meet and perform outside of the classroom where Internet connectivity is assured.

Moreover, **students have to be trained in responsible and organized self-study behavior**. For less advanced students, exact URLs are to be provided. In TVET institutes, known lascivious or social media search entries and websites are to be blocked to avoid misuse.

On the whole, the method relies on responsible and conscientious students and trust. It is a **very effective and popular method of learning**, very adequate to common practices in companies later on and to lifelong learning. Typically, the method requires two to four notional hours of teaching and learning, depending on the research challenge and the work problem to solve.

6.4.2 Guiding Texts method (“Leittext assignments”)

Developed as a self-learning tool in the context of dual apprenticeship programs to guide on-the-job competence acquisition in companies, the guiding texts method—or *leittext* assignments, as a technical term capturing its Germanic origin—consists of a **booklet of instructions or guidelines how to conduct a certain job and acquire skills**. This booklet has been compiled by teachers, company supervisors or groups of technical experts.

It contains exploration tasks, gives clear-cut instructions and guides the tour of an otherwise highly individual and self-organized approach. Usually, the students are free to explore tools, a workshop or even a real work setting for that, and finish a job they are asked to do, e. g. for a secretary to write a dunning letter and variate the type from a gentle reminder to a threatening letter.

QTA Key Insight No. 42:

A *leittext* guides students through a hitherto unknown work process by highlighting tools and resources needed, how to handle them and how to produce the intended product.

It may **contain graphical and visual input, pictures, checklists and procedural instructions, technical terminology and work instructions**. The teacher is present to take on the role of a guide for self-learning and advisor on how to go ahead if stuck, as this method is normally performed during regular contact hours.

Still, a web quest has to be prepared by explaining the teaching methodology and reinforced by reflecting the potential learning success.

6.4.3 Station Learning

Station learning is a highly self-regulated teaching method. Teachers work out and provide **different physical stations in different locations of a classroom or workshop where students find self-learning material** to solve a work task or problem.

Several stations are needed to find a solution. One or two more provide extra material for high-achieving learners to upgrade solutions in heterogeneous groups of learners, i. e. differing widely regarding performance. **Each station caters to different expectations and provides a different access and media type**, e. g. by providing a laptop with a tutorial, a listening device with a podcast or recording, an article, a set of pictures, a work manual etc. at different stations.

Pragmatic QTA Hint:

Resist the temptation to ask students to acquire knowledge only by station learning. That contradicts the five general principles of TVET. There should **always be work problem or task and a work life situation** taking center stage during station learning.

The station learning method is highly student-centered, and fun to teach for teachers. However, the required material for several stations takes time to prepare. So, again, teachers should have some material available at their institute, and should prepare samples to be re-used for their field of teaching during initial and continuous teacher training. Highly favored station learning settings include modern media as well, i. e. podcasts, high-quality videos and tutorials or simulations etc. Of course, such

learning materials can be either self-produced, downloaded or simply borrowed from colleagues.

The typical set-up of a classroom or workshop for the station learning method looks like this:

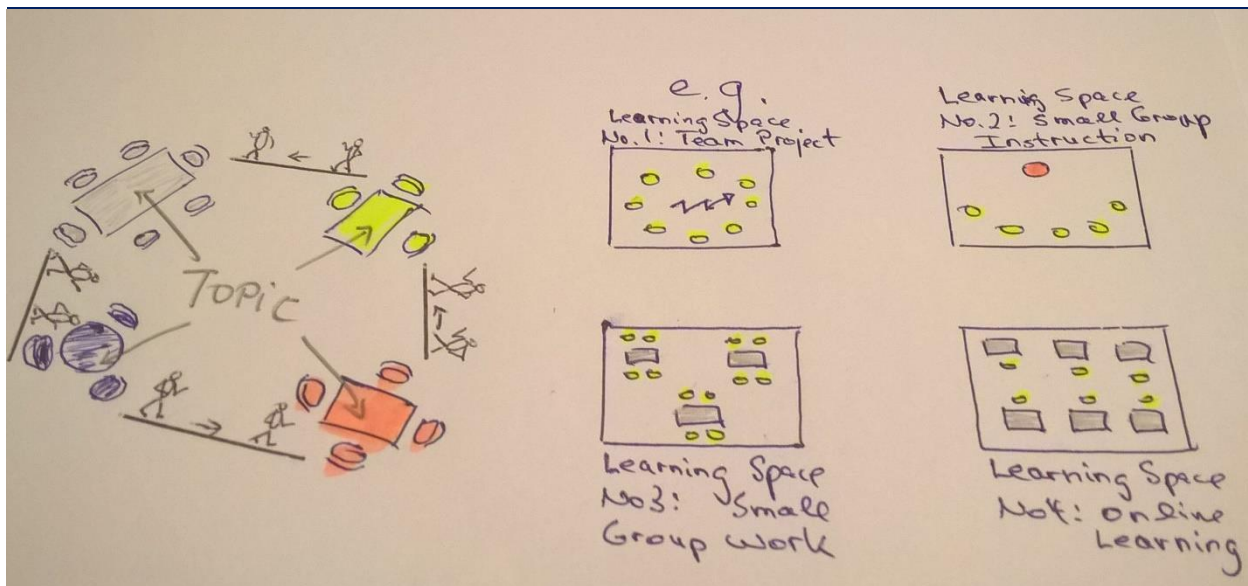


Figure 23: Potential set-up for the station learning setting

Teachers are advised to **make use of station learning at least once for each batch**, since students enjoy that method. The method generally scores very good learning results too.

If teachers prefer **a more structured approach** during which a certain sequence of stations is to be passed through or unavoidable, that is also possible—a rigid station sequence is called a **Learning Ring**. Obviously, it is less self-organized and somewhat more teacher-centered again, but still tenable in TVET.

The station learning method is very productive way of teaching and comprises mostly about 90 to 120 minutes, yet excluding the explanation of the procedure (about 15 minutes) and the vital presentation and reflection phases (about 30 minutes).

6.5 Mini-Methods of teaching and learning

Mini-methods commonly design one entire practical session or lesson, if it is no longer than 45 minutes. They are very functional for organizing whole teaching and learning sessions, allowing methodological variation from one direct teaching contact to another.

6.5.1 The Debate Method

This method **splits the entire group of learners in several teams embracing one particular standpoint**. The ultimate debate is between two pronounced vantage points, taking one position each and collecting as many pros or cons as possible.

In the process of the actual debate, there is a moderator giving the word alternately to both sides. The set-up may look like this and makes for a heated debate and exchange of arguments:

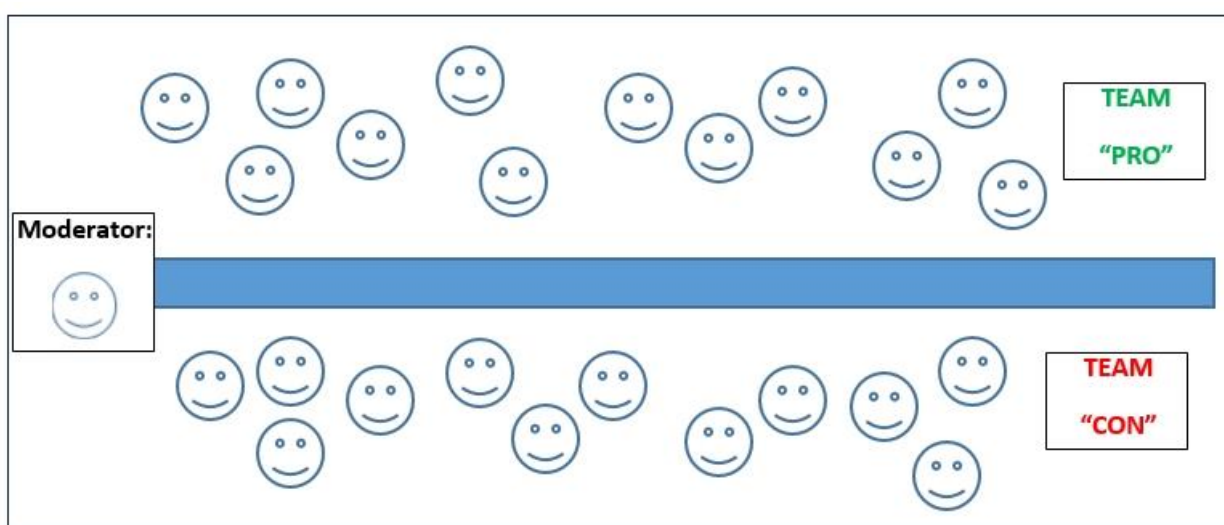


Figure 24: Sample set-up of a debate as a teaching method

The debate method traverses the following phases:

- Introducing the work-relevant topic
- Team building by rallying behind one stance
- Collecting arguments from provided sources, brainstorming or research (depending on prior knowledge and experience of the students)
- Actual debate
- Withdrawing from the role and discussing results
- Individual reflection.

Generally, there are two different types of a debate:

- (1) **Structured Debate:** The structured debate has a strong moderator, allocating speaking time, asking different participants to come up with arguments, changing the word back and forth between the two teams and finishing in time by asking for concluding arguments from both sides—and potentially summarizing the main points at the end.

- (2) **“Untamed” Debate:** The moderator only sets the time, intervenes if things get personal or insulting and if individuals dominate the entire discussion. Otherwise, the debating swings back and forth freely and possibly fiercely and boisterous, as long as general rules of debating are adhered to.

Finally, if there is topic that does not allow for two different positions, **several teams may be established just by changing the setting of the debate** (e. g. the four corner debate, enabling four different team to discuss). Such a setting is more difficult to handle for the moderator, but very effective in terms of learning and student activation.

Topics that may allow the debate method to come into play are various, and may be **cross-sectorial in nature**,

e. g.:

“Do we need unions or work councils?” or

“Should work place security always be the top priority?” or

“Should we treat unfriendly customers politely nonetheless?”,

or very technical, e. g.:

“Is storage in clouds acceptable from a data-security point of view?” or

“Are e-cars and hybrids or combustions engines to be promoted?” or

“Should vegetarian and vegan meals always be on the menu in restaurants and hotels?”

These topics given above allow for a pro-con debate. Of course, if smaller teams are intended and more vantage points, different opinions may be allowed. An example for that could be:

“A foreign manufacturing company wants to produce in your home area. Different teams could be made up:

Municipal politicians, Environmental protection group, Potential employees and Graduates in the sector, a Protectionist Group for the country etc.”

The sector in question can be fine-tuned to the students, e. g. food production, car company, shoe company, electrical appliances producer such as for fridges or air-con machines or else.

Debates are very vibrant, involving and make students aware of different viewpoints. Aside from very technical arguments, the debate method fosters **highly needed soft skills** such as empathy, seeing through the argumentative position of another person and anticipating customers’ wishes and demands. Finally, it **enables students to scrutinize and question** their own positions and work procedures, again and again.

6.5.2 Mind-mapping / Concept-mapping method

There is a major difference between **mind-mapping** and **concept-mapping**. While the **former is well-known as a grid that connects key terms**, starting from a central point from which branches go out into twigs and ramify into a potentially complicated system that may display real-life complexity, **the latter is a diagram which visually shows concepts and ideas as well as their interrelationship, weight and sub-topic status. Mind maps work with lines and pictures only while concept maps heavily use symbols of different sizes and types to indicate differences in weight and importance or strength of relationship.**

In practical teaching, the two forms often overlap, which is alright for the purpose of everyday teaching and learning, i. e. using them as synonyms is broadly acceptable.

Both are powerful methods to visualize technical and vocational areas. Especially concept maps are willingly used by technicians, engineers, architects and other technically-oriented professionals to systematize complex systems and technical realms.

Real-life examples of such mental maps easily prove the point of usefulness. The following example sheds light on what teachers should ask their students to do, maybe involving some research beforehand on the students' side. Cooperation may prove very fruitful in coming with mental maps as well.

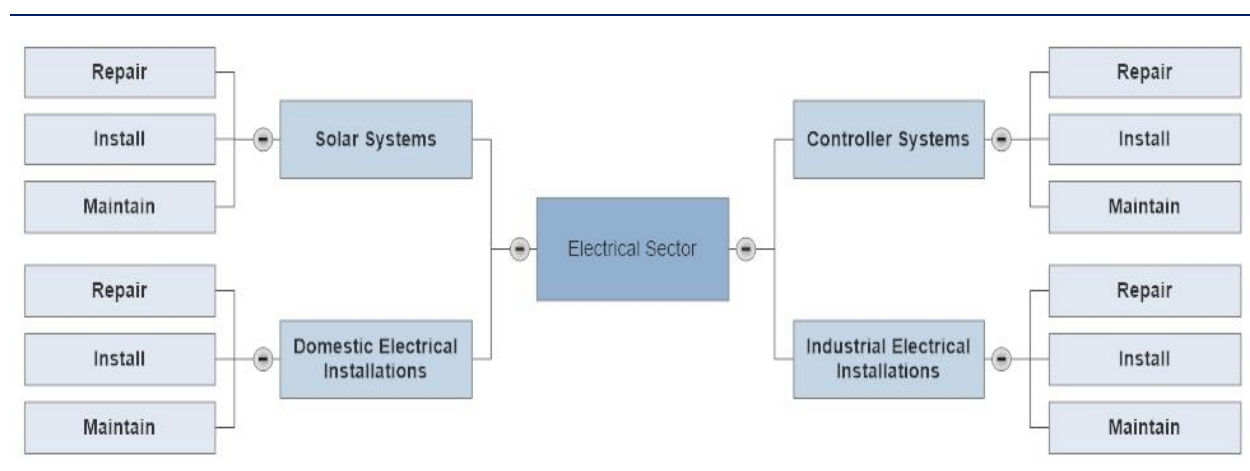


Figure 25: Example mind map about areas of the electrical sector

Rectangular shapes in mind maps may also be circles. Usually, the second tier is smaller in size and has a different color or borderline to indicate levels.

Mind mapping can bring about order where there has been chaos in a student's mind—and is an effective method to explore and to consolidate a field of learning.

Concept maps are more complicated in nature, as the following example illustrates:

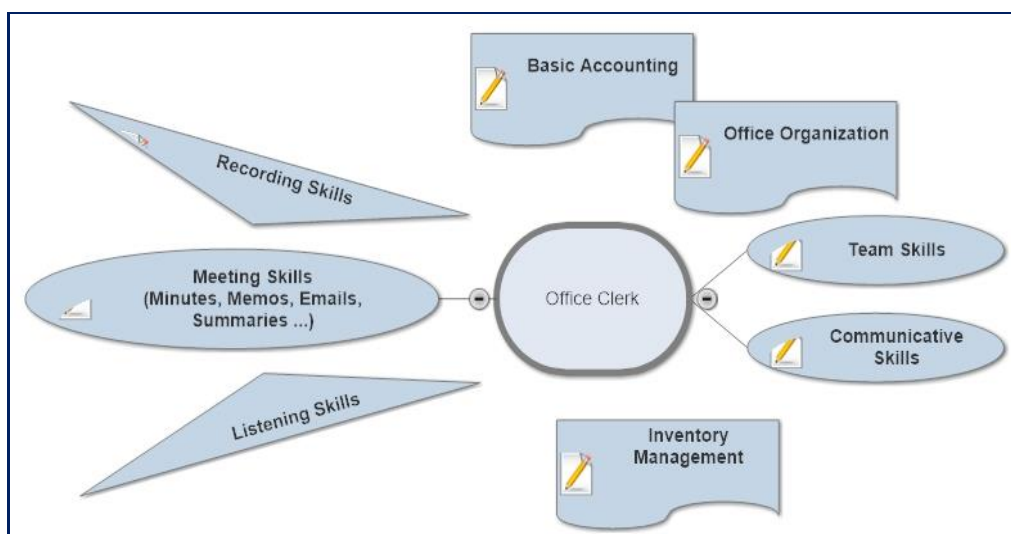


Figure 26: Example of a concept map about office employees' skills and duties

Concept maps generally need some prior agreement or cutline that explains what different shapes stand for, e. g. a triangle explicates concepts in ellipses as in the example given above.

They also **visualize and structure interrelations, subordinations and complete illustrations of a complex field**. Concept maps may be the outcome of individual or team work phases or the outcome of a longer reflective phase.

The two sample mental maps provided are simple in nature. **Used as an elaborate teaching method, they should generate more layers, more branching out and more key terms and concepts.**

Finally, mind maps and concept maps can be drawn by hand or produced with the help of sophisticated, but also for free software tools (e. g. *FreeMind* on a Linux basis). And pictures, symbols etc. should be added as deemed fit.

QTA Key Insight No. 43:

All in all, mind maps and concept maps are innovative ways to let students structure and visualize how they understand a certain area of competence in their occupational realm.

6.5.3 Placemat Method

The placemat method is a potent method to **activate prior knowledge and skills and to generate new ideas**, based upon others students' comments. The method also links working alone and working in team nicely in alternate sessions.

To make the method relevant for practical work, it should be utilized before solving a work problem or after having tried once already. The placemat method works according to following procedure, having two loops (one to several loops possible):

- Teacher explains how the method works.
- Teams of four students are established.
- Working alone: Writing down ideas on your section on your own.
- Working together: Read the others' ideas and agree on common ground.
- Write common ground or compromise in center of placemat.
- Exchange setting with other groups, leave product behind.
- Starting anew with step number three, and take other group's final product into consideration.
- Presenting your last compromise product to the entire group.
- Discuss and decide on final model solution.
- Reflect the outcome for yourself.

To make the method more accessible, the following example clarifies the proceedings, as it shows the empty poster that give the method its name (placemat):

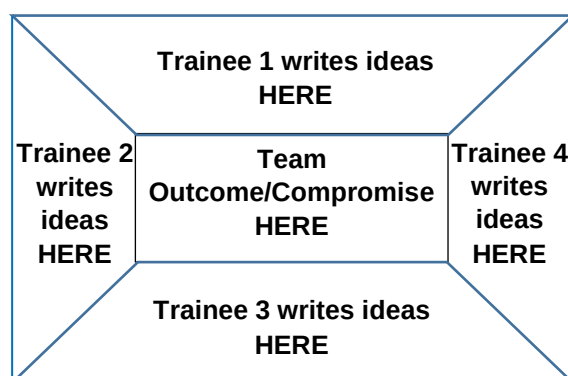


Figure 27: General layout of a placemat visualization

The final outcome may look like the following illustration, after the team has produced individual and group results. The topic for the example would be: “Your customer reports a short circuit in his kitchen regarding the electrode lamps. How do you analyze and solve the problem?”

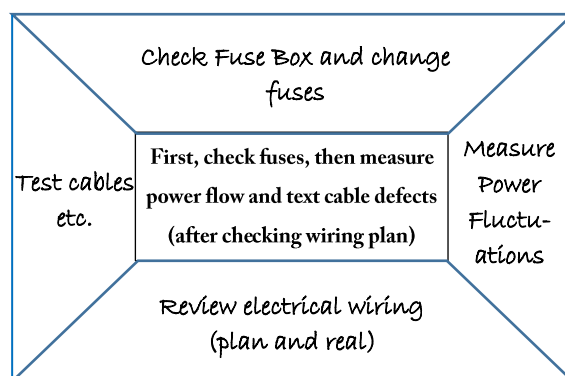


Figure 28: Potential placemat method product of one team

If only one team is put to work, then the product above will already be the final one. However, other teams can screen the products of previous teams, suggest improvements and come up with “a new center” of the placemat as an enhanced compromise version. This can be repeated several times (numbers of loops), before all teams present their “last product”. **Doing several loops will refine the product** if sufficient expertise is prevalent in the entire group. In that regard the method is very flexible.

Ultimately, the placemat method can be fine-tuned to the time allocation of one unit of teaching by varying the time provided for the actual work on the placemat and whether or not there is a second loop.

QTA Key Insight No. 44:

The placement method is a product-oriented method to **identify and depict different ways to approach a work problem** and different steps how to proceed. It brings to light standard, innovative and maybe even odd ways of how to work. Against that background, it **promotes technical and cross-curricular thinking**—and doing, if the final outcome of the entire group is put into practice in a workshop in the end.

6.6 Micro-methods of teaching and learning

Micro-methods shape different phases of teaching and learning in TVET as part of one lesson of practical, living up to the pedagogic rule of thumb to provide variation for students in terms of methodology to maximize learning effect.

Generally, these methods can **last from a few minutes up to 30 minutes**, as a part of a direct teacher-learner contact sessions.

Three typical methods held in high esteem by practitioners are introduced below.

6.6.1 Fish Bowl method

The so-called fish bowl carries its name because it entails an **inner and an outer group arrangement**, with the inner group being physically active and the outer group observing, i. e. having an observation task, and pondering if and when to intervene, which can be done any time. So the settings resemble a fish bowl with fish “hurrying around inside” and observers watching them, aside from the fact that observers can actually “turn into fish”.

The action of the inner group may be a discussion, a role play or even a theatrical play, depending of the task or problem at hand. In any case, different opinions and ways of work should come to the fore and be thoroughly questioned. The method has the handy effect of including the entire group of learners and can be used to structure the exploration of a task or a problem, i. e. being used during the student’s phase of self-directed learning, or during the presentation phase. For example, worker-superior or employee-customer talks can be simulated in such a setting, with third parties intruding to make the spectacle more fun, more unpredictable and more interesting—and ultimately more conducive to learning. If the inner group acts out a discussion, there should always be an open chair (“hot chair”) for outer group members to take a seat and contribute if deemed appropriate. Students have to be trained and encouraged in terms of confidence to make use of that option.

The set-up for a fish bowl is illustrated as follows:

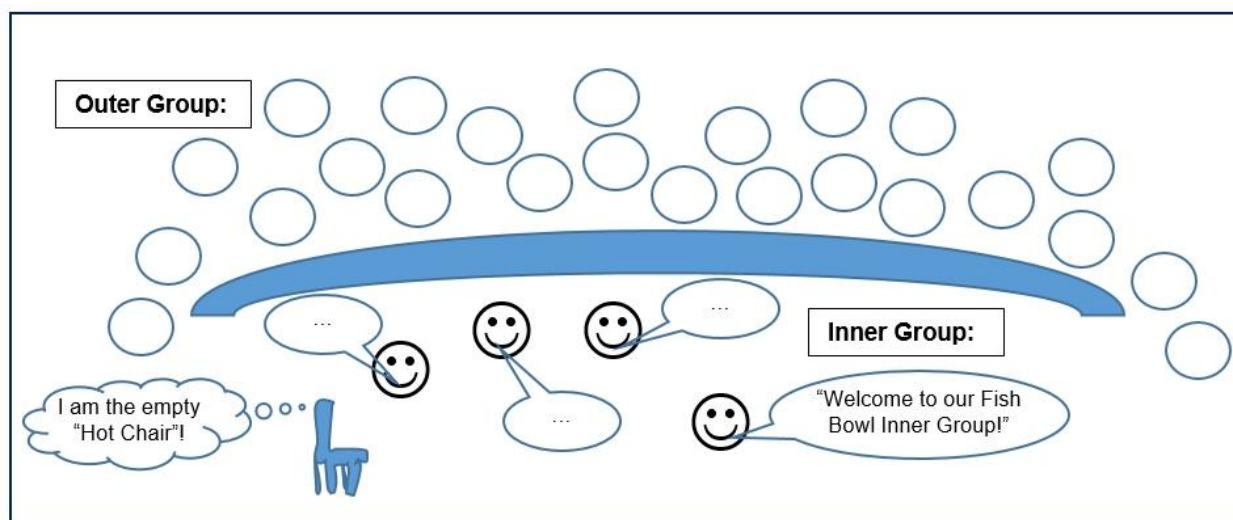


Figure 29: Prototypical set-up of a Fish Bowl

QTA Key Insight No. 45:

As integral part of the Fish Bowl method, there are two layers of students, with **the inner group discussing or acting energetically and the outer group observing and being ready join the action any time**. This way, a larger group of learners can be engaged in active learning in an appealing setting.

For example: In this setting, students in the inner circle can discuss the pros and cons work procedures, after having worked out a specific work procedure in different teams before.

Topic example:

The topic, say in “production technology”, could be:

“What is the best approach to machine operation maintenance—and how would you implement the approach in distinct steps?”

Each group sends one delegate into the inner group of the Fish Bowl that “defends” their approach. The teaching method **enhances learning results in terms of quality and deepens acquired procedural skills**, aside from promoting soft skills such as self-confidence, verbally defending one’s stance and arguing technically as well as accepting other groups’ approaches as well.

Pragmatic QTA Hint:

Member of the outer group can also be asked to take notes and write a protocol of the action and discussion in the inner group. Such a protocol can be collected and used for assessment, if assessment criteria have been agreed on before (e. g. form, illustration of arguments, tables, presentation of own opinion etc.).

6.6.2 Ball Bearing method (Double Circle method)

The so-called Ball Bearing method is an extremely potent teaching method when it comes to the necessity of **explaining work processes and products to colleagues and customers**, but also **for negotiating and general communicative skills**. By the way, it is a great method for language teaching as well.

Even though the term Double Circle method is used as well, the Ball Bearing name is metaphorically speaking more appropriate, as **the method mimics the functioning of a ball bearing in the technical sphere**. That means there is an inner circle of students sitting on chairs, directly facing other students in an outer circle. That works with even numbers; in the case of uneven numbers one student may face two partners.

The method is truly flexible, as it can be used to communicate individual work results, or group work output, or have students discuss work issues—or even do brainstorming on a problem. Students may be allowed to use older notes or not. They can be advised to take notes via drawing sketches, mind maps etc. Moreover, students can be asked to remember what they have been told and transmit that input to another partner.

Partner change can be initiated after a few minutes, by shifting a few seats clockwise in the inner circle. Next you can ask the outer circle to shift two seats counter clockwise, and so on. Teachers can vary the length of each interval as deemed appropriate—and even end it nicely by grouping, for example, the inner and the outer circle again for a presentation of the opinions of the wider groups, to recapitulate.

Pragmatic QTA Hint:

A highly advisable usage of the method is as a faceted presentation after intensive group work. For example, four teams of four students each work on one case study, four other teams of four on a different one. Ultimately, the 16 students of one case study constitute the inner circle, the 16 of the second case study the outer circle. Alternately, they explain the potential solutions to their case study to their partners vis-a-vis. In the end, the entire outer circle group presents the cumulative ideas of the inner circle about their case study solutions to the plenary session, and vice versa. This way all students present, all students are involved, many ideas float—and potentially value-added solutions are presented in the end.

The following illustration visualizes the teaching arrangement used for the Ball Bearing method, and can accommodate large groups of students as well.



Figure (plate) 30: Layout of the Ball Bearing method

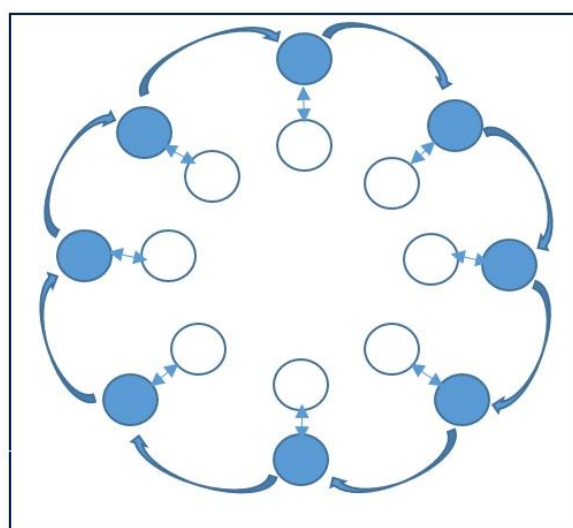


Figure 31: Basic set-up of the Ball Bearing method

In the illustration given above, the short double-sided arrows indicate communication, the larger curved arrows movement of students after one round of talking has been concluded. For the next shift, the inner circle can move into the opposite direction, i. e. counter-clockwise.

QTA Key Insight No. 46:

The Ball Bearing method is a **highly communicative and highly student-activating** teaching method. It is a great chance to let all students present during group work presentations, but also for shy students to practice. Students typically like it very much—and the method boosts technical and soft skills simultaneously, if work-relevant issues are presented and discussed.

There is a variation to this in terms of setting, called the “**Speed-Talking Row**”, where the students do not sit in a circle but in a row, or several rows. That may be done depending on the location or if the teacher likes that better. The shifting of students can be carried out by moving from the end to the beginning of the row on one side, and everybody else simply move over a few seats.

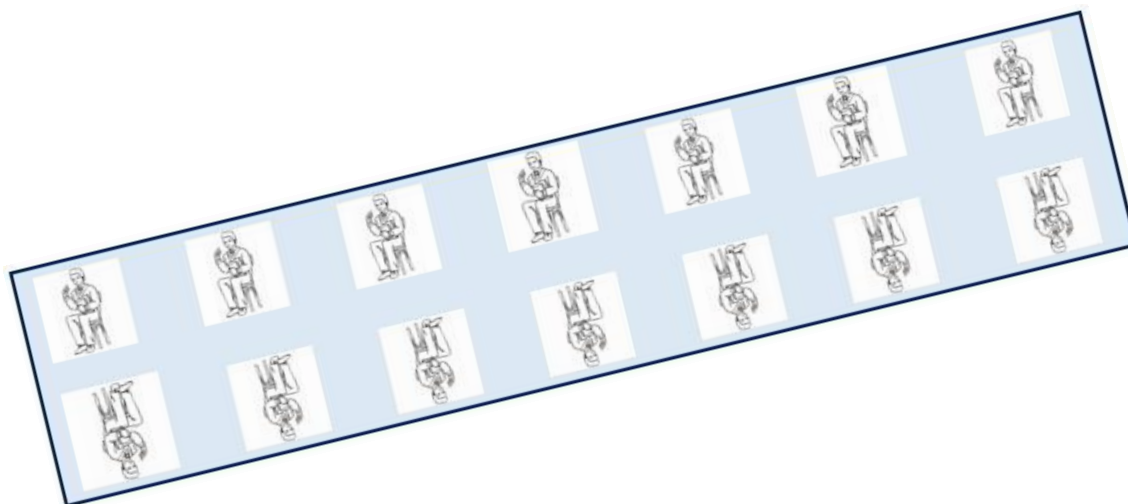


Figure 32: Possible diagonal arrangement of a “Speed-Talking Row”

6.6.3 Freeze Frame method

A freeze frame can be considered **a snap shot of a role play**. A role play may be the most well-known and widespread method of involving students actively and making them taking different positions as well as fostering empathy.

A freeze frame, however, takes some extra thinking. Since it does not involve words, **the expression of the body as a medium of communication has to be pondered, as well as the position, the posture and the “frozen” interaction** with others. Obviously, it takes intense group work and discussion how to display a solution via a freeze frame.

It is a very innovative way of presenting results. So students can visualize a production process, or a potentially successful customer negotiation or some work flow in a freeze frame, i. e. **an excerpt frozen in a certain moment, just like a statue**. Work aspects can be symbolized or human bodies used to indicate something entirely different. Again, it is an extremely **motivating method** for students to be involved.

Finally, the team freeze frames should be photographed and then displayed via multimedia projector, to invite further discussion and go deeper into the subject. To provide a few incentives to use the method, a freeze frame presentation of a team may look like that:



Figure (plate) 33: Two examples of freeze frames

In the first example the participants are highlighting a product, while the second one illustrates and metaphorically displays a process struggling to find a way. Both products can be discussed extensively, and conclusions for real work situations be drawn.

6.6.4 Fantasy Journey method

A fantasy journey is a method to **appeal to students' imagination**, promote creativity and conceptual planning skills as well as the capability to visualize work processes and intended work outcomes in the future—and how to reach goals.

The fantasies to be invoked should be work-related in TVET, but still inspiring, stimulating and perhaps even exhilarating. A fantasy journey can productively be used to start a mega-method, such as a project or simulation, and to create motivation and curiosity at the outset. But it may as well be the product of creative student work, i. e. coming up with self-styled fantasy journeys. It can also be employed at the very end of a module, for example, to deepen the experiences, look ahead and ready students for reflective written entries into instruments of learning reflection.

To make the method more approachable, the following example is provided:

A Fantasy Journey about a better work place and better processes:

- “Close your eyes, sit down (on the floor), relax,
- imagine yourself in a wonderful place, look around, enjoy,
- now, imagine yourself in a lovely place where you would like to work in your occupation innovatively,

- what are the main nice features of such a lovely work place? Imagine.
- What would you change to make your real working life that lovely. Imagine!
- Now imagine, what can be really achieved in your company? Imagine your first step!
- Imagine a new fancy work process you are going to try out with your colleagues within the next week!
- Imagine something small you can start doing tomorrow!
- Now, imagine again another place that you love. Stay there... Smile...
- That is having a good time at work and doing the right thing.
- Open your eyes again, keep smiling..."

THANKS for THAT, THANKS for your IMMERSION into a potential better and more effective world of work for you!

YOURS, wholeheartedly: (Name of teacher)

Figure 34: Example of a Fantasy Journey in TVET

Generally speaking, students should sit down at ease, or even lay down on a mat, and close their eyes. Easy-going, meditative music should be played in the background to give the method its full impact. Then the teacher reads out the fantasy journey, in an articulated and modulated way of speaking, sonorous and agreeable. If there is student that is able to do it, or if the fantasy journey is a team work product, then a student should be the reader. **Students must be asked to truly immerse into the procedure.** A final reflection takes place written style. In case there is an atmosphere of trust and belonging, students may discuss their musings peer-to-peer as well at the very end.

QTA Key Insight No. 47:

The Fantasy Journey method is an appealing way to create students' curiosity at the beginning of a teaching session or to wrap up a module. It can be used to reflect individually and to promote creative, imaginative and reflective skills in particular.

Capable students even create self-styled fantasy journeys about work processes or outputs for presentation purposes.

Chapter 7: Evaluating TVET sessions

7.1 A framework of evaluation for teaching and learning in TVET

In order to continuously improve and update teaching and learning processes, which is in the best interest of teachers and institutes alike, some degree of evaluation is indispensable. In this context, evaluation does not necessarily refer to some regulatory or supervisory body that checks on teachers whether they live up to a collection of criteria concretizing good teaching, but an effective in-house approach to become aware of teaching shortcomings and ways to get better.

QTA Key Insight No. 48:

Teaching and Learning is the No. 1 core process in a TVET institute (cf. Boehner 2017). Therefore, **evaluating and improving the key process of quality is a natural top-notch goal** of any successful institute.

This is not to say that there should be monitoring of teaching by an external regulatory body in TVET from time to time, but external inspectors should never hit on individual teachers, as they come in from outside and can surely only perceive a small excerpt of real life. Instead, inspectors can collect sample observations about teaching and learning in a college or training center in general, and discuss teaching tendencies afterwards with management. We shall discuss this approach regarding a so-called teaching auditing procedure later (see section 7.4: External auditing of teaching and learning).

Nonetheless, internal evaluation and external auditing must fall back on internationally **established and reliable criteria of good and effective teaching** in TVET (cf. Borich 2016, Meyer 2016 and Wilson & Conyers 2013),⁹ such as:

- (1) **Competence-based approach to teaching and learning**
- (2) **Reflective learning taken place**
- (3) **Net time dedicated to teaching and learning in workshop / classroom**
- (4) **Reputation and dedication of the teacher**
- (5) **Degree of mental and physical student activation**
- (6) **Meaningful contexts and relevance for work**
- (7) **Motivation and curiosity facilitated**
- (8) **Positive atmosphere of learning in workshop / classroom**
- (9) **Positive and trusting teacher-student relationship**
- (10) **Regular variation of teaching and learning methodology**
- (11) **Competence-based and variable assessment methods**
- (12) **Student counseling part of teaching and learning process.**

⁹ For findings especially relevant to TVET, cf. Zhao & Rauner (2016).

QTA Key Insight No. 49:

Successful continuous improvement of teaching and learning in TVET **depends on established criteria** of good and effective teaching and learning, as provided by research evidence and experience. Criteria have to be **transparent** to all staff.

Internally and more importantly, there should be **a framework of evaluation** concerning teaching and learning in place—with the aim to raise the quality teaching or retain high quality consistently to serve customers better. In an ever-changing world of work, **teaching has to adapt continuously**—and this process of adaption has to be accompanied by a professional but internally molded framework, highly valuable and topical to the training institute. Such a framework consists of mainly three components, to be substantiated by evaluation instruments (for examples, cf. Boehner 2017):

- **peer-to-peer evaluation**
- **superior-based evaluation**
- **external customer feedback.**

Sometimes, if the TVET institute is part of a wider network, an “internal” evaluation, instigated by the head office takes place on regular basis, which is not entirely internal, as it is not driven by own staff. Each type of evaluation uses different tools and has different objectives. The different types are discussed below.

QTA Key Insight No. 50:

The drive to adapt teaching and learning to modern standards and requirements is the responsibility of all staff in a TVET institute, mainly of **academic staff amongst one another** (by peer-to-peer evaluation) and a **top-of-the agenda task of any institute’s senior management** (by superior evaluation). These two approaches have to become deeply engrained in TVET institutes, supplemented by **feedback of customers** (especially by student feedback about teaching experiences).

7.2 Peer-to-peer evaluation of teaching

7.2.1 Teaching tandem evaluation

Tandem evaluation (also simply called peer-to-peer evaluation) is **a mighty tool of developing** teaching and learning internally, as fellow teachers are local experts of teaching and learning processes. Notwithstanding this, they have different personal backgrounds, different training and deviating predilections when it comes to methodology of teaching and assessment. That means, even though they may teach the same subject, the same trade or occupation or the same modules, they **perceive things differently and broaden the horizon of a colleague** that they observe and give personal feedback.

The **pre-condition is that teachers open their doors to colleagues** that come to observe their teaching. Following observations, a feedback session amongst colleagues has to be scheduled that is **critical but benevolent**. And whatever has been said and observed stays with the two colleagues concerned (**concept of confidentiality** in tandem evaluation). Nonetheless, it may **open the eyes of individuals for new ideas, approaches and ways of teaching**, especially if colleagues attend training sessions as part of continuous teacher education.

Even though that kind of **day-to-day evaluation** is not on the institutional level and no records are being held, it can propel development of teaching and learning at a local level. Peer-to-peer evaluation also **fosters cooperation and trust** internally, and opens up teachers for continuous development.

That is why TVET institutes should install tandem evaluation as a peer-to-peer experience and internal method of quality control, and **monitor if it is taking place, not what has been unearthed** by the colleagues. The institute should also plan and schedule the time and place of such tandem work, in coordination with the two teachers involved.

For the purpose of getting information that is at the institute's disposal, peer-to-peer evaluation is the wrong approach. For such matters, **superior-based evaluation** of teaching is asked for.

7.2.2 Peer-to-peer best practice counseling group

This approach does not expect any prior observation of lessons or workshops, as one **group member freely talks about a critical incident from own and recent teaching experiences** that could be relevant for all colleagues being present, such as dealing with difficult students, technical updating of knowledge and skills, equipment malfunctioning, marking issues during assessments, poorly working assessment methods or student conflicts because of grades, conflicts or issues with companies, lacking OJT places, leadership issues inside the institute, conflicts among colleagues etc.

The peer-to-peer counseling group system rests on several premises:

- eight group members (one moderator, one case provider)
- no superiors, i. e. only the hierarchical level (e. g. instructors)
- rotating case giving, i. e. telling a critical incident by different group members
- confidentiality, i. e. the cases and suggestions stay within the group
- regularity, i. e. every four weeks for one hour
- standing group members (change possible, however).

In general, peer-to-peer counseling groups follow a fixed procedure, sitting in a circle, close to one another on chairs:

Procedure of “peer-to-peer counseling group” evaluation:	
(1)	Welcoming of all members by a rotating moderator (1 minute)
(2)	One group member provides a critical incident case (about 5 minutes)
(3)	Everybody else listens and gives a spontaneous reaction (about 5 to 10 minutes)
(4)	Two groups of three are formed to work out professional solutions (about 20 minutes)
(5)	The two professional solutions are presented to the case provider that does not comment, only listens (about 10 minutes)
(6)	Then, the case provider explains what she/he actually did in the situation, how this compares to the suggested solutions and what seems to be most useful and applicable from the two solutions (about 5 minutes)
(7)	Everybody else can now comment on the case provider’s feedback from a personal point of view (5 to 10 minutes)
(8)	Each group member takes a note about what could be useful, professionally, for herself/himself (about 5 minutes)
(9)	The moderator thanks everybody and announces the date and place of the next meeting (1 minute)
(10)	Time frame: about 60 minutes altogether

Again, peer-to-peer counseling groups allow TVET institutes to get ever better, and **benefit from one another**. **Expertise is spread**, everyday problems solved by synergetic ideas and teamwork gets well established and promoted. Even though there are again no public records, **TVET institutes should instigate these internal groups** and take records as regards membership and time of meetings, not of the content.

For content-based records, the following method is to be used.

7.3 Superior-based evaluation of teaching

The evaluation of the quality of teaching and learning processes is an essential feature of quality assurance and improvement in a TVET institute. That has to be **carried out by senior management**, many times by the head of the institute in person or a representative, e. g. an academic director. The internal evaluator should be knowledgeable and experienced with regard to high quality and modern teaching and learning in TVET, particularly concerning teaching methodology and the general competence-based approach.

Consequently, TVET institutes should implement **a scheme of regular observations of academic staff** when it comes to their performance in teaching and learning, give feedback, recommendations for development and agree on goals for the future. These goals are to be reviewed the following year. That can ensure high-quality teaching and learning as well as continuous developments. Assessment should also be observed and included into feedback and development talks.

To make the superior observations more transparent and objective, mutually acceptable forms should be used. Examples for these purposes are provided below:

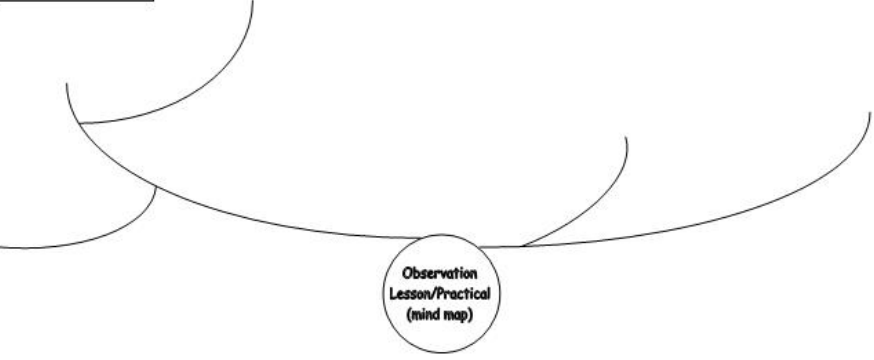
Use Reverse too!		Open Questions for the Teacher:
	Criteria for Efficient Learning: (1) Learning Motivation/Curiosity: (2) Appropriateness of Training: <i>(Goals/Content/Group of Learners/Method match?)</i> (3) Context of Work/Life Situation: (4) Changing of Perspectives? (5) Level of Interaction: (6) Student-activation?	
Analysis of the Teacher Trainee in terms of teaching skills (Strengths - Weaknesses): High Level reached in: <i>(e. g. teacher personality, trainees acceptance, loud voice, method variation etc.)</i> Potential for further Development: <i>(e. g. modern media usage, communicative activities, assessment etc.)</i>	Long-term learning took place? Questioning own perspective of observing: <i>(Own patterns of observation? Pre-dispositions activated? ...)</i>	

Figure 35: Lesson/workshop observation sheet (open), part 1

The reverse side may contain the following open-ended questions:

Further Questions to answer:	REVERSE SIDE
(1) Could you observe competence-based learning and teaching? 	(2) Has the teacher pursued the focal point in terms of competence development (see written planning draft!)?
Room for further remarks: 	

Figure 36: Lesson/workshop observation sheet (open), part 2

The tool illustrated above is an innovative tool for open-minded observation and well-designed for the proven and tested expert observer.

A more conservative tool can also be used, that guides the observer in greater detail, but gives up on the open framework for individual observations. The first part of such an observation sheet is typically rather general in nature, and can simply be ticked:

All categories below should be verifiable by truly observed behavior, otherwise do not tick!

What type of course and interaction did you observe?

(e. g. NVQ level 4, plumber, practical or Level 5, QS, subject: English):

Please tick (☐), if the following forms of interaction were to be observed:

- | | |
|--|---|
| ☐ = teacher up front, classroom setting | ☐ = working alone |
| ☐ = group work | ☐ = project work |
| ☐ = partner work | ☐ = station-based work |
| ☐ = free workshop activity | ☐ = learning plan-based work |

How much activity was on the students' side?

- ☐ = none ☐ = little ☐ = some ☐ = a lot

Which media were used (e. g. blackboard/whiteboard, computer presentation, flipchart, note cards, books, Internet etc.)?

When it comes to speaking, what was the estimated share of the teacher?

- ☐ = 0-25% ☐ = 26-50% ☐ = 51-75% ☐ = 76-100%

Was there any counseling of individual students?

- ☐ = none ☐ = little ☐ = some ☐ = a lot

Did the learners get a possibility to reflect on their learning outcome?

- ☐ = none ☐ = little ☐ = some ☐ = a lot

Beyond the taught lesson, did the teacher give incentive and a task to keep on studying alone/independently?

- ☐ = none ☐ = little ☐ = some ☐ = a lot

Was there any meaningful and productive formative assessment?

- ☐ = none ☐ = little ☐ = some ☐ = a lot

Figure 37: Lesson/workshop observation sheet (closed), part 1

The second part of a closed-question observation sheet is somewhat more gradual and requires a judgment on the side of the observer. It still provides closed-ended questions only, even if on a scale:

The following items are selected with regard to “criteria of good teaching”:		PLEASE TICK:
4 = very much	3 = mostly	2 = a bit
1 = not at all	(√)	

	Observations:	Degree:			
Promoting learner's will to learn (core process)	The learners are made to understand the importance of the topic for her/his (professional) life.	④	③	②	①
	The teacher connects the teaching to the occupational and/or private background of the students, to make learning relevant.	④	③	②	①
	The teacher encourages and praises (if deserved).	④	③	②	①
	The teacher treats mistakes as a chance for learning and doesn't scold learners.	④	③	②	①
	The teacher shows appreciation and respect for learners and expects likewise.	④	③	②	①
	The learners are encouraged to answer questions and solve problems (without rushing).	④	③	②	①
Managing the learning process (core process)	The teaching process was without interruptions, noise and rule breaking.	④	③	②	①
	The teacher enables students to talk and participate.	④	③	②	①
	The teacher allows for self-organized and self-regulated learning as much as possible.	④	③	②	①
	The teacher provides a time frame, learning material and manages the room.	④	③	②	①
Classroom management (supporting process)	The teacher introduces clear rules and implements them.	④	③	②	①
	The teacher uses his time for teaching (and not for organization or else).	④	③	②	①
Individual learning support (core process)	The teacher promotes individual learning via supportive formative assessment	④	③	②	①
	The teacher makes use of stronger learners to support weaker ones.	④	③	②	①
	The teacher counsels and moderates learning.	④	③	②	①
Basis of Teaching (supporting process)	The teacher clearly implements the mandatory curriculum.	④	③	②	①
	The teacher uses clearly structured lesson plans / training plans and sticks to them.	④	③	②	①
Assessments (core Process)	The teacher does assessments in manifold ways.	④	③	②	①
	The assessments are recorded properly and are available any time.	④	③	②	①
Lessons only	Teacher input is only as much as needed, leaving room for task-based and problem-solving learning.	④	③	②	①
	Teachers make use of several teaching methods in one lesson.	④	③	②	①
Practicals only	Learnings focuses actions used in the world of work.	④	③	②	①
	Learners work on tasks or projects.	④	③	②	①

Figure 38: Lesson/workshop observation sheet (closed), part 2

Finally, there is a rather newish tool in TVET institutes that works with the results of feedback and counseling sessions, following the observation of teaching and learning, a so-called “**agreement of results**” with academic staff.

The “agreement on results” can be introduced by the institute leader or the academic director/coordinator. From that point on “professional dialogs on objectives and results” should follow on yearly basis. The tool can be designed following the pattern of this prototype:

AGREEMENT ON RESULTS in TVET in ...

Name of TRAINING CENTER / COLLEGE: _____

Name of ACADEMIC STAFF: _____

AGREEMENT No.: ____

TEACHING AND LEARNING GOALS set after our discussion:

① ...

To be reached until: ...

How to measure or to provide evidence: ...

② ...

③ ...

Signatures & Positions of Parties to the Agreement:

Figure 39: “Agreement on results” for academic staff

QTA Key Insight No. 51:

Any TVET institute should have a **scheme of regular lesson and practical observations by superiors** in place. Observations shall be conducted in a transparent and fair manner and expectations be communicated beforehand and made very clear. Subsequently, goals for future development of teaching and learning processes should be set and agreed on—and progress discussed at least every year with each individuals.

By the way, having a **reward scheme for achievements** would be a great tool as well.

7.4 External auditing of teaching and learning

It is non-arguable that an internal system of evaluation of teaching and learning to secure and enhance to core process of quality in any TVET institute has to be in place. Nonetheless, government has some justified interest in making sure a certain level and kind of tuition is taking place in the TVET system it is responsible for, so that state-installed inspectors should regularly, ideally every second year, travel to all TVET institutes in the country and perform random workshop and lesson observations and management counseling, including agreeing on goals to reach.

For that reason, a country-wide stipulation on what is considered good and effective teaching in TVET is asked for, initiated in higher education for teacher and implemented during hands-on teacher training. **Empirically corroborated criteria for good teaching** must be established in the system, well communicated and continuously demanded in the sector.

If all of these conditions are met, some regulatory body can be commissioned with the task of dispatching inspectors to overlook teaching and development thereof. For this purpose, the following system can be in place:

- (1) Train inspectors well concerning
 - (a) unbiased methods of teaching observations,
 - (b) objective and benevolent feedback talks and, most importantly,
 - (c) evidence-based and up-to-date criteria of good teaching and learning processes in TVET.
- (2) Work in pairs to reduce subjectivity.
- (3) Observe many practicals and lessons in a TVET institute to get a complete picture.
- (4) Give instantaneous feedback to TVET institutes and agree on development goals for core processes with top management as well as representatives of academic staff (e. g. with quality committee members).

In any case, it is of paramount importance that **external auditors observe practicals and lessons**, to gain insight into the culture of teaching and learning prevalent in a TVET institute. That is why a **commonly accepted and standardized observation and feedback sheet is to be used**, displaying the state-of-the art findings on criteria of effective teaching and learning in TVET, but also taking into account country and cultural specifics and peculiarities.

All players in TVET should be **well acquainted with the observation sheet**, as it influences teaching and learning to a great deal—and should by implication be designed with great care. Evidently, the standardized sheet suggested above for superiors can be used as well, but should be put to a vote and maybe tinkered with to fit local wishes and demands.

Finally, this book proposes an observation sheet that does not influence institutes' creative latitude too much, as it is a fairly open tool, which can only be handled by teaching-learning expert auditors though.

For beginners, a more standardized tool with closed-ended questions might be more suitable.

A very open observation sheet may follow the **STAR observation template**:

S & T Situation of Work & Work Task to perform	A Teacher's Action	R Students' Results	Additional Observations
Excerpts taken from teacher's Lesson & Practical Plans plus from institute's syllabi (that includes teaching methods used, student activities, different phases of teaching)	What is happening? That describes how the teacher organizes and steers the session, including giving instruction, counseling of learning, media and material used by the teacher.	How are students working and what do they produce? That describes how students respond to the teacher's methodology, how they interact, how successful the teaching approach is and if they create results (learning effects?).	Which observable action needs to be commented on, improved or is laudable? That section highlights particular strengths and weaknesses!
Example: <i>Curiosity Phase</i> <i>Instructions</i> <i>Student Work</i> <i>Presentation</i> <i>Reflection</i>	Teacher presented a self-recorded video about a customer talk that went astray. Teacher gave work instructions via Powerpoint slides. 4 student groups of 6 work out another solution to customer talk Teachers asked for plenary performances of role plays. Teacher insists on taking notes into reflective learning diaries.	Students laughed and understood the problem. Students took notes. Students are very involved, talkative, use text books for technical background. Students showed lovely, funny and captivating role plays—not all solutions technically correct though. The students seem to know the procedure and are very eager.	At the end of this phase, the teacher should have discussed the problem in detail. Video was wonderful! Teacher was not present for support, but took notes or something else up front. Teacher praises students for good performances, but doesn't ask for correction of mistakes. That seems to be a well-established practice, very praiseworthy.
Confirmed by:			
_____		_____	
Teacher		External Observers	

Figure 40: Standardized sample of observation sheet for external audits

7.5 External feedback regarding teaching and learning

Not least, it is essential to **gather information, mostly from students, about how teaching sessions have been received by customers**, both for internal evaluations and for external audits.

For this purpose, an **array of standardized forms are readily available** and should be put to use (see Boehner 2017). In due course, either individual teachers or an internal quality committee for institute-wide evaluations collect data and analyze results. **Negative student feedback regarding teaching immediately and automatically triggers a change** of teaching and learning methodology or even teacher behavior and attitudes in well-functioning systems (for more details, *ibid*).

Chapter 8: Modern methods of competence-based assessment

8.1 A synopsis of assessment methods in TVET

To start with, it makes sense to provide a synopsis of assessment instruments that can be made use of in TVET. Obviously, some are termed slightly different in various countries or even slightly alternated, but essentially there is a canon of instruments that can be put together in an easy to oversee table as presented below.

It is very important for TVET teachers to have that overview and selected appropriate methods of assessment accordingly:¹⁰

Synopsis of assessment methods in TVET	
Part 1: Instruments for written assessment	
Formative assessment methods:	Summative assessment methods:
Rubrics	
Written self-assessments	
Reflective Learning Portfolio	
Observation and Appraisal Sheet (with feedback criteria)	
Report on Processes or Outcomes (Learning Reports)	
Minutes	
Peer Feedback and Assessment	
Visualization of Learning Process or Products (e. g. tables, graphs, technical drawings, mind maps, computer-based concept maps, collages, caricatures, metaphors etc.)	
Scribble Note Pad	Traditional Test
Reflective Learning Diary / Reflective Learning Journal	Scientific Test
Reflective Sheet	Homework Check
Statement of Learning Condition	Assignment
Group Work Process Appraisal	Review
Planning Visualization	Paper
Part 2: Instruments for oral assessments	
Learning development dialogue	Presentation
Interaction Appraisal	Oral Contribution
Learning reflection Performance	Direct questioning & Stimulated contributions in discussions

Figure 41: Synopsis of assessment methods in TVET

As can be seen in the synoptic table above, there is quite a number of assessment methods that should generally be combined during and after any learning process.

¹⁰ For further reading into modern formative and summative assessment, see Brockhart (2017) for deeper insights and research feedback.

QTA Key Insight No. 52:

Good teachers apply a great variety of different assessment methods in TEVT that best fit the tasks that students work on during their learning actions. For example, an **interaction appraisal** should be the assessment tool of choice grading a role play.

Because this textbook is not entirely focused on assessment, only **some exemplary methods of assessments are elaborated on**, thereby applying the pedagogical principle of exemplary learning propounded in this publication. In contrast, it is worth going into detail when it comes to potentially all major assessment methods available in the course of training and the subsequent career of a professional teacher's experience (cf. Boehner 2015, Butler & McMunn 2014 or Griffin & Care 2015 for that purpose).

It is worth pointing out, to avoid confusion, that assessment methods are sometimes, and often alternately, also called **instruments of assessment**. And even more confusingly, in everyday pedagogic jargon they are also termed **tools of assessment**, again as a synonym. In this chapter, the term "tools" is deliberately avoided, as the technical term tools rather refers to methods and forms to assure and enhance quality. **Student assessment should be carried out by proper instruments** to appraise performance, relying on competence.

QTA key insight No. 53:

To avoid confusion of terminology:

Whatever is being used to measure the success of student learning shall be called **assessment method** or **instrument**; and whatever is being used to evaluate or enhance quality in a TVET institute, measure success of quality actions being taken or obtain feedback from customers shall be called **tools**.

8.2 A short explanation of popular assessment methods

This section is dedicated to ensure that everybody involved in TVET interprets the **concept and the application of the instruments of assessment listed in the table** above in a comparable way. Moreover, the descriptions given provide **a framework of assessment to fall back on throughout a teaching career** and assist in trying out some new assessment method occasionally. Most of the instruments are flexible and allow for adjustments in *de facto* assessment situations.

As several of the more important instrument are elucidated in the following section in greater detail, the descriptions provided will only cover the essentials:

- (1) **Rubrics:** Rubrics usually come in the **form of tables** and at variable length, covering entire modules or even courses or only a few contact hours of teaching. Correspondingly, the **first column of the rubrics names the competencies** to be developed during the teaching and learning process, followed by three to six columns that **identify categories of competency** development (current state of development), rising from “incompetent” (a category that has not to be defined) to “expert” level. Each category explains what knowledge, abilities and skills in which work situation the student can master, generally going from beginner level, to advanced learner, to routine operator up to highly competent professional level. **Three to four categories** can usually be easily identified—to distinguish five to six categories is mostly linguistically difficult and practically hard to keep apart, but sometimes viable. Rubrics can easily be employed as self-assessment and third party assessment as well as in a formative and summative way.
- (2) **Written Self-assessments:** Modern-day assessments in competence-based teaching and learning ask for a **self-aware and self-critical learner** that is the best expert when it comes to the status quo of the own learning process. That is why TVET students should be **asked to write down their learning achievements and competence level** on an empty sheet of paper in comparison to expected learning outcomes, either provided by the teacher or simply by a curriculum or institutional syllabus. These self-assessments can be used in a formative way to **discuss progress and give learning advice** and in a summative way to **reconcile with the teacher’s final appraisal** in a teacher-student talk.
- (3) **Reflective Learning Portfolio:** The learning portfolio has become an **indispensable type of assessment in competence-based training**, as it provides the continuous background to **reflect individual competence developments by noting down frequent entries** after learning events, achievements and aspects still to learn. In a portfolio, evidence (e. g. pictures, recordings, clips, films, documents, work samples, third-party feedback etc.) is provided and can be discussed with the teacher. Portfolios may take the form of a folder, binder, cardboard/plastic file or digital file on a portfolio platform. Portfolios can be used formatively to discuss learning, and criteria-based as a summative assessment.
- (4) **Observation and Appraisal Sheet:** Such sheets **collocate relevant criteria for good work in a learning process**, good participation during discussions or group work or good presentations. Then they allow for quick notes to take in table cells and give a scale for performance such as

very good, good, satisfactory, sufficient and insufficient

or a range of symbols (e. g. 😊 😐 😞) to tick.

Based on such **live observations to be recorded on a standardized sheet** that is well known to students as well, a final grade can be awarded. Such sheets can be prepared individually by any teacher—and with groups of learners together as well—for special assessment needs, and put to work formatively as well as summatively.

- (5) **Report on Processes or Outcomes:** This report is usually a running text, sometimes including images, pictures, drawings and illustrations of work processes and of products as well. Text content **describes matter-of-factly how learning has unfolded**, mostly **describing teamwork phases**. The emphasis can be on the learning process or the result, i. e. the learning outcome or the finished product. For such reports, relevant criteria of assessment have to be agreed on, such as

- I. accurate and true description of work flow
- II. special achievements and successes including explanations
- III. used quality criteria for appraisal of process and product
- IV. rigor of arguments
- V. correct usage of technical terms
- VI. business-style layout of report
- VII. usage of appropriate software for report etc.

Teachers can also ask for interim reports, e. g. during long-term projects, to use the instrument with a formative and counseling intention, or as a final report for summative grading.

- (6) **Minutes:** Minutes are a very flexible instruments for various learning events, such as lessons, practicals, group work sessions, presentations, plenary discussions and role play performances etc. They may **describe very short teaching intervals, but also longer processes** such as teamwork in written style, in bullet point, table-based or running text form according to a student-teacher agreement. In any case, they need to be handed-in using a **neutral writing style**, which means non-judgmental, descriptive and non-normative language. In the end, **minutes summarize key results**, again without providing an own opinion. The ability to take a neutral stance is very important in many technical occupations and in dealing with customers' wishes and demands. Minutes can be assessed during a learning process to give hints about the process itself. In addition, the assessment can target abilities to observe and describe in a non-normative style or the holistic description of a process or outcome in the end.

- (7) **Peer Feedback and Assessment:** To obtain feedback and get assessed by peers is a **very effective method to develop further and get a realistic view** on acquired competencies *per se*, as **fellow students are keen observers**, knowing the reference group very well and being aware of many strengths and weaknesses that may slip the teacher's attention. Consequently, honest and critical feedback is a valuable component in assessing performance. Peer feedback can be made use of continuously, but also at the end of a sequence of teaching, module or course.

However, it is a **tricky affair to include peer assessments into a final grade**. That is the responsibility of a teacher, and such a procedure invites bonds of friendship, personal issues and ethical codes not to hurt anybody's future to kick in—with the impact of grade inflation to hold sway. That is why **peer assessment is used best in a confidential fashion**, i. e. amongst peers only, sparking reflective entries into written instruments. Peer assessment can be provided face-to-face and verbally, but also via written style and anonymously—the latter setting the stage for truly honest peer feedback. That kind of assessment **should be made use of by all teachers in TVET regularly**. Peer assessments prepare students for typical work appraisal situations later in life and provide an impartial peer view that may be invaluable.

- (8) **Visualizations:** To visualize processes or products is a very important skill in many occupations. Visualizations help to plan, make work processes clear and explain simplified technical facts to customers. Moreover, they make the visually-dominated human brain understand and learn more easily. That is why a teacher asks students to visualize a process or a product appropriately. Generally, a **given form of visualization** (e. g. a graph, diagram or a technical drawing) is **to be stipulated**, and concrete criteria for assessment provided (e. g. accuracy, clearness, correct scaling, suitable terminology, work-reality orientation, acceptable by companies, professionalism, time restriction, proper effigy of reality etc.). As visualizations can be requested any time, they may have a formative or a summative character in assessment.
- (9) **Scribble Note Pad:** A scribble pad is usually a tablet, mostly **free of an obligatory form, to take notes with regard to ongoing learning**. That means the scribble note pad supports a formative approach. As there are **no agreed prior criteria** how to keep this instrument, it is **not suitable for summative assessment**. Even formative assessment is only doable if the students decide to share the entries with the teacher. That may be meaningful, but should not prevent students to **make fanciful, spontaneous and honest entries about glorious and wretched learning events**. Also, reasons for successful actions and learning as well as for failures and shortcomings should be taken note of spontaneously. In particular, plans on how to improve learning success and competence development can be forged easily in the scribble pad.
- (10) **Reflective Learning Diary (synonymously used: Learning Journal):** This is usually **a booklet, either free of form or consisting of an agreed-on format**. Sometimes TVET institutions provide booklets, termed Learning Diaries, and expect daily descriptions of work and teaching experiences, mostly to be ticked by company supervisors or inspectors and teachers. These instruments are **closer to Learning Reports**, as they ask for descriptive entries. **Such instruments are no Learning Diaries**. The latter asks for daily entries, but **in a reflective and expressively non-descriptive style**. It is less important what the trainee has done, but **what has been**

learned anew or consolidated and how to move ahead more effectively during the course. Typically, teachers expect daily and regular entries in a reflective style that is accessible to teacher counseling, i. e. with **a formative assessment purpose**. When the instrument has taken hold, a secret and private section of the learning diary can be established to reflect upon very private issues that may influence learning success.

- (11) **Reflective Sheet:** This instrument is extremely flexible, but firmly rooted in the **reflective and formative camp**. At any time deemed appropriate, the teacher may ask students to take out an **empty sheet of paper, stop the teaching and learning process and pause, to let students take notes** about their perceived level of proficiency achieved, including reasons why and how to improve. That is a powerful instrument of **make students aware of what they can do already and what is to be learned still**. To collect this sheet of reflection and hold subsequent teacher-student talks to counsel and give learning advice is a very effective and competence-based way of formative assessment.
- (12) **Statement of Learning Condition (SLC):** Based on third-party feedback (e. g. company supervisors, teachers, institute inspectors, peers) and collected evidence, students determine their “**state of affairs**” with respect to a number of competencies they are supposed to acquire, e. g. in a module. SLCs can be in **descriptive and written form**, but also prepared in **graphical or diagram style**. SLCs are **for formative purposes**, as the teacher comments on self-assessment for certain competencies and supports or shifts the vote and locus of attention for learning to come. SLCs may be a point of departure for a summative assessment, taking developments into consideration. The following example shows a graphical solution for SLCs: (e. g. trade: Mechatronics Technician, Module: Installing Solar Panels)

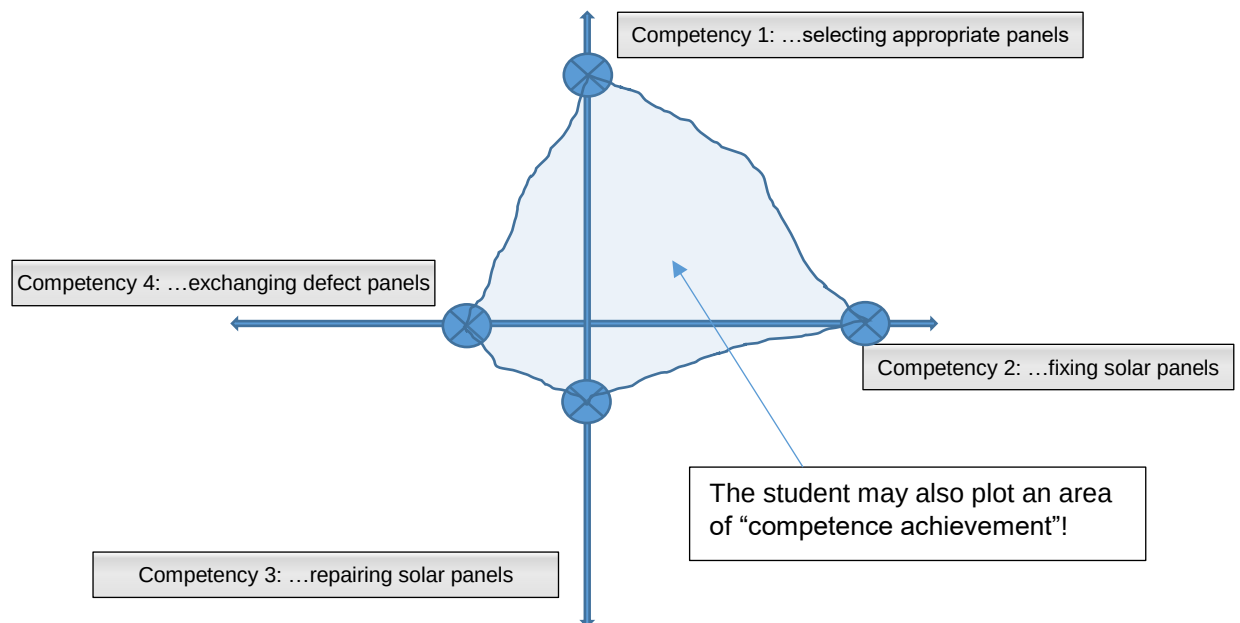


Figure 42: Graphical representation of SLC

Theoretically speaking, SLCs can be used as a final assessment as well, but it is unclear how assessment would translate into a grading scale.

- (13) **Group Work Process Appraisal:** In assessment, tapping group work is one of the toughest jobs of a teacher. The most obvious way is to observe the process is by using a standardized and criteria-driven observation sheet. But that may easily stymie group work and observing several groups simultaneously may well prove impossible. That is why the group **should self-evaluate their work process and provide insights to the teacher via a form that focuses on desirable features** of a group work process:

- I. input from all group members
- II. benevolent attitude towards one another
- III. functioning communication between all team members
- IV. final output contributions from all group members
- V. different roles and tasks attributed to group members
- VI. goal, outcome and timing are the result of conscious work
- VII. resources and external feedback appropriately used and
- VIII. cooperative spirit and no lasting conflicts.

Of course, these features can be altered or expanded. The appraisal form can come as free and continuous text with respect to all features, or given on a scale (such as a Likert scale from 1 very poor to 5 very good or a “smiley” scale), depending how much detailed information the teacher wants. In any case, the **usage should be formative**, as for summative assessments the honesty of such appraisals may be called into questions.

- (14) **Planning Visualization:** This instrument usually **comprises manifestations such tables, flow charts, schedules or plans of procedures** and are the outcome of a planning phase for large-scale projects or performances. In such cases, a feedback of the teacher is desirable to adapt the planning afterwards. This way the teacher **continuously assesses and facilitates ongoing learning processes** and can foretell potential effects and products. As the planning instrument is not the final product, it is **not eligible for summative assessment**.
- (15) **Learning Development Dialogue (LDD):** This type of **teacher-student talk** subdivides learning into different phases and opens up the opportunity to **determine interim progress and shortcomings** in terms of competence development. In the modern classroom and workshop, LDD is essential to **support and facilitate competence acquisition in long-term self-directed and student-centered learning environments**. Not to engage in teacher-centered action frees the teacher to spend more time with LDDs and formative assessment, a very competence-based way of providing effective TVET.

- (16) **Interaction Appraisal:** That is a form which **looks into verbal comments and statements of individuals during group and plenary discussions or answers** to direct teacher questions and stimuli.

Commonly, the appraisal of interaction rests on the following criteria:

- I. Frequency of speaking up
- II. Technical correctness of comments
- III. Quality of comments
- IV. Correct usage of technical terminology
- V. Reference to others' arguments
- VI. Reference to questions/stimulus
- VII. Inclusion of other students
- VIII. Degree of encouragement for further discussion
- IX. Level of expression in linguistic terms.

As such an appraisal normally involves a degree of subjectivity, it is **better used as a formative method**. But given the fact that the criteria can be honed and displayed along a performance scale, the instrument may be used **as a summative one as well**.

- (17) **Learning Reflection Performance:** This method is normally based on **short oral feedback sessions at the end of a learning session**, either face-to-face or amongst peers. Learning reflection performance is considered strong if the students abstains from descriptions and concentrates on competencies acquired, in particular to what degree as well as what the students still need to do. That means **students engage in meta-level thinking about learning successes and problems** as well as some planning of future learning. A second criterion of high performance is how much own **reflective assumptions overlap with the third-party observations**, by peers or teachers. Again, as the evaluation of verbal reflections—note-taking can be used as well during the reflective conversation, especially for intended future action—involves quite some subjective musing, this instrument should be **utilized for formative assessment purposes only**. Learning reflection performance is best combined with diaries or portfolios to increase impact.

- (18) **Traditional Test:** A traditional test is the **quintessential written instrument for summative assessment**. It collects a **number of relevant questions to be answered and grades the instrument of a given scale** (e. g. fail, pass, merit, distinction, extraordinary distinction) according to a certain percentage of achievable points. Questions are weighed and points attributed, depending on their level of difficulty, scope and time needed to solve the task. However, to make traditional tests **competence-based** they have to **fulfil four criteria** these days:
- I. Test items have to include a **description of a practical work situation** on which the task is based.
 - II. The solution cannot be based on knowledge alone, **a skill or ability** must come to the fore and be described as work action.
 - III. There must be an explicit question **requiring the delineation of a work process and inherent knowledge**.

- IV. Test items must have **different levels of difficulty** that lay bare different levels of competence amongst test takers.

Questions formats are left to the teacher, as all formats can be made competence-based. In a smart way, **tests can be used formatively as well**, if the focus is on competence development and not final assessment.

- (19) **Scientific Test:** Everything that has been stated for traditional tests holds true for scientific tests as well. In addition, they have been **pre-tested with potential test-takers and items have been ameliorated**. And the test passed the requirements of quality criteria such as objectivity, reliability and validity. In TVET, such high-quality tests are **usually not available** for everyday purposes of summative assessment, but if, then they are a “luxury class” instrument to assess.
- (20) **Homework Check:** If students are requested to perform a job or learning task at home or, more relevant in TVET, at the work place during practical training, then the teacher can **check on obeying the instructions and the carrying out of the task**. If the task was a written one, the outcome can be collected and graded according to formerly introduced criteria. Mostly, however, after practical training, homework will have been a practical task to do. So the teacher can ask for demonstration of the competency, best alone or in a small group in order not to potentially make a student look foolish. A homework check can also be a smallish test, asking only a few questions regarding a few isolated competencies that were to master lately at home or at work. Such a written homework check in test-like style can easily be used formatively as well.
- (21) **Assignment:** An assignment is a **typical or problematic work task that must be solved**—and the solutions are explained and handed-in written style. How much the solution is illustrated and supported graphically is oftentimes left to students. However, the expectations can be narrowly defined as well. As a matter of fact, **clear assignment expectations usually facilitate fair and objective grading**. Assignments can come in the form of case studies or simply descriptions of work tasks. The traditional concept of “Learn Assignments” are no true assessment instrument. Potentially, a homework check can also be based on such an assignment, but a “learn assignment” alone does not qualify as an instrument. Large-scale assignments function as summative assessment instruments, smaller tasks can be used for formative aims as well.
- (22) **Review:** A review is a task to **find out something new or check on known results if they still pass the test of reality**. A typical review can be to examine customer demands, survey customers’ wishes, check for quality of work or search for streamlining options in work procedures. In a review, students report on findings of their endeavor. Fundamentally, only

advanced students at the end of modules or entire courses can come up with a review, but reviews make up very **suitable and demanding instruments of summative assessment**. As a matter of necessity, teachers, at best in coordination with their students, have to disclose their exact expectations from a review, also concerning formality.

- (23) **Paper:** A paper is an even more **sophisticated instrument of summative assessment**. On top of technical competencies, students need to have developed an ability to do research and to write for science propaedeutically. Therefore, a paper requires **a work problem to be solved that can be researched**, e. g. “Is the number of tourists going up in the luxury sector in this district?” or “How much repair work was done for hybrid cars in the automotive sector in the ... region?”. **Findings and issues of practical relevance for the world of work have to be discussed and germane consequences presented**. Such an assessment is appropriate only for higher levels of TEVT students that want to qualify for higher education as well. Some low-key paper may be asked for, surveying peers and colleagues only—only containing descriptive statistical results. Such papers can be requested also in craftsmen trades, but sparsely so, perhaps at the end of a long-term industrial training. Evidently, clear-cut expectations have to be spelled out to assess fairly.
- (24) **Presentation:** Modern-day work skills comprise a complex set of hard and soft skills, which can be beautifully incorporated in presentations of work results. Presentations usually take the form of **speeches in front of an audience** that are visually supported by software and multimedia and/or traditional media. Unfortunately, presentations are notoriously tough to grade, and students generally expect good grades only. Such issues can be addressed by agreeing on several performance criteria and making them palpable by categorized descriptions. The cooperation of students is essential in determining such criteria and expectations. Moreover, **peer and teacher assessments as well as self-assessment can be asked for**, avoiding the trend towards good grades only. All of this leads to **presentation observation sheets** that grade presentations at the end of a work process.
- (25) **Oral Contribution:** During short phases of teacher-centered learning, there should never be a teacher talking alone. That is why teachers should ask questions and provide stimuli and therefore invite students’ feedback, comments, answers etc. At the end of a module or course, a teacher can evaluate all these student contributions via a summary judgment. For this, the teacher must have prepared notes after each teaching sessions with regard to the oral contributions of students on that particular day, if applicable. Signs of tendency are sufficient (e. g. ++, +, o, -, -- or in a similar way). That can lead to a final summative grade. The teacher has to tell students early on about own expectations regarding frequency, quality,

use of technical language and inclusion of fellow students for high accomplishment.

- (26) **Direct Questioning & Stimulated Discussion Contributions:** The first one is a tricky instrument, as it easily stultifies students, makes them nervous and look foolish, if applied in front of the entire group of learners. So direct oral questioning should only be made use of face-to-face, in which case it mounts up to viva voce, as a matter of fact. More appropriately, teachers should provide verbal stimuli and take notes about how react and get involved, i. e.:

- I. Frequency
- II. Correctness
- III. technical versatileness
- IV. integrating style
- V. technical penetration
- VI. weighing of other arguments etc.

According to these criteria, a summative grade can be found, but should be weighed with some instruments of written assessment.

8.3 Multi-purpose methods for summative or formative assessment

Key QTA Insight No. 54:

Assessment **instruments that straddle formative and summative assessment are first and foremost instruments of learning reflection**, such as rubrics and learning portfolios.

There are some quite flexible, multi-purpose methods in assessment that **allow for either formative or summative assessment** (or both!), depending on how they are used. Such flexibility comes in handy for a TVET teacher looking for student-focused and competence-based assessment methods that can, in the first place, be used continuously during a TVET course (formatively) and at the end to take stock of achievements (summatively).

Some of the assessment instruments introduced in the summary table (see Figure may be entirely self-explanatory, but many are not. True to the teaching principle of exemplary learning, the inclined reader shall be **immersed into assessment options that are deemed important and trendsetting in TVET**.

Any teacher's mind is to be engrossed by the following selection of instruments, as they are important and partly revolutionary in TVET.

8.3.1 Selected significant assessment instrument No. 1: Rubric

The probably the most influential and useful instrument in TVET is the so-called **rubric**.

Rubrics are the instrument to be in the 21st century TVET system. There are **most likely the *non plus ultra* of the age of competence-based assessment** (cf. Brookhart 2013).

Why is that?

- First, the focus is on achievements instead of flaws and mistakes.
- Second, they outline a development path ahead by identifying categories of competence.
- Third, they allow for self-assessment and third-party assessment alike.
- Fourth, they spell out competencies that materialize in “work actions”.
- And finally, they are considered impartial and fair because assessment is based on real observation and evidence.

Naturally, rubrics have disadvantages as well because the transition from one category of competence to another is somewhat clear-cut as the explanations in the rubrics' table cells may indicate but rather a continuum. That means an individual could well be close to the upper or lower edge of one competence category—something that would have to be spelled out during oral counseling sessions rather than emerging from the rubric. However, **one can manually mark lower, center or upper areas in a rubric as well**, essentially transporting the same message.

Pragmatic QTA Hint:

Select potential achievements in a rubric in different colors, first by the trainee followed by the teacher. This way **overlapping or deviations can be visualized** immediately, and discussed face-to-faced subsequently, **based on evidence** of observed learning and simulated or real working (e. g. during OJT), group involvement and final products.

To make the functioning of rubrics understood and to provide some sample instruments, a few general rubrics for ubiquitous competencies are made available below:

Sample Competency Rubric No. 1: Social Skills

Competencies in the social sphere:	Beginner	Social Adolescent	Socially Mature Actor	Social Sage
Putting oneself into someone else's position/being empathetic	hardly able to take somebody else's position / finds it hard to be considerate	Partly able to take somebody else's position / is considerate if asked to	able to take somebody else's position and is generally considerate / helps others if necessary	always takes other people's positions and is always considerate / helps others as a matter of course
Being tolerant and respectful	accepts others' opinions and respects them occasionally	generally accepts others' opinions and treat them with respect	tolerates and respects others' viewpoints and opinions, and still representatives own views respectfully	always tolerates and respects all aspects of other people, while empathetically stands her own ground
Dealing with feedback	takes feedback only if asked to and has trouble to deal with critical aspects	generally takes feedback and partly accepts and changes because of critique	mostly takes feedback with interest and sees negative aspects as chance to improve	always enthusiastically and actively asks for feedback and takes appropriate action following it
Dealing with deviating opinions and information	sometimes identifies contradictory viewpoints and information obtained	generally identifies contradictory viewpoints and information obtained and recognizes the sources	Identifies and evaluates sources of contradictory viewpoints and information	Always anticipates and evaluates different and potential sources and persons of contradictory viewpoints and information
Dealing with conflicts	Only occasionally able to act appropriately and de-escalating in conflicts, rarely comes up with solutions	often acts acceptably in conflicts, brings in and accepts suggestions for solutions	speaks in deescalating manner, develops solutions together	Proactively anticipates conflict potential and act accordingly, always level-headed in conflict, works out compromises and reflects problems afterwards
Working cooperatively	contributes to team effort if asked to	partly contributes to team results on own behalf	works together, asks back and always contributes own agreed-on part	continuously works collaboratively together, coordinates team effort and shares responsibility for final team product
Adhering to agreed-on rules and regulations in organizations	only sticks to certain rules, and must be supervised to do so	is generally able to live up to common rules and regulations	always adheres to rules and regulations and actively points out inappropriate rules	always adheres to rules and regulations and actively contributes to a productive change and development of rules and regulations

This sample rubric from the area of social competencies can be used by superiors, teachers, trainers, supervisors and even colleagues to provide external feedback. It can also be applied via self-evaluation to pinpoint own perceptions of social interaction and own proficiency.

Mostly, it should serve as point of departure if change is asked for by an employer or training center or after self-recognition of needed development has materialized, especially if the diagnosis put the individual on the “Beginner” or “Adolescent” levels.

The social-competencies rubric is a complex tool of several pervasive competencies in the social area.

In some instances so-called **mini-rubrics, only catering to one particular ability or skill**, make sense. Mini-rubrics can be developed with little effort and put to action tailor-made.

The following example of a mini-rubric is taken from the sphere of communicative competencies, singling out **a focus on verbal interaction** with customers, superiors, teachers, colleagues or even peers:

Communicative Competence:	Level: Not yet competent	Level 1	Level 2	Level 3	Level 4	Level 5
I am able to: participate in conversations and to respond to conversation partners.	is unable to participate actively in conversations	contributes a few elements in a conversation if asked, mostly quiet and modestly attentive	contributes a few points in a conversation on her own, more quiet and reasonably attentive	generally brings in own arguments and responds to arguments, very attentive	always weighs and brings in own arguments, is an active conversation partner, eager to understand and find common ground	develops own opinion in active verbal conversation, also repeats and reformulates partners' arguments, can actively listen very well

Assessment via such a **mini-rubric, consisting of a single-row**, is very useful for focusing attention on the development of one special competency. Obviously, the judgment should never rely on one single observation. In empirical science, a single performance can be random—a **true competency** shines through only in various situations and work tasks **performed multiple times**, as a competency is repeatable at will and not random.

Another very interesting example for a useful competency rubric in training institutes is on methodological skills of working and learning. The following example can be used to guide trainees in the ability to do self-study phases and grow as a person as well as work self-sufficiently.

Sample Competency Rubric No. 2: Methodological Skills

The following rubric **caters to basic skills and abilities to be obtained in order to master challenges that require the application of logical and structural methods**, especially the abilities to deal with information, to structure work obligations and to engage in problem solving. Each student should be competent at least up to level 2 to succeed in work life. The sample rubric is mainly construed to

carry out a self-evaluation, potentially to reconcile with the some judgment of a third person, such as a peer, a trainer, a company supervisor or superior.

Methodology Skills	Not Yet Competent (Level 0)	Basic Competency (Level 1) “I can...”	Waystage Competency (Level 2) “I can...”	Maturity (Level 3) “I can...”
“I am able to extract information from texts, figures/charts and maps.”	Not at all or almost not	...read texts, figures/charts and maps and describe the content, sometimes with support.	...answer questions referring to texts, figures/charts and maps.	...anticipate relevant questions that arise from information provided from text, figures/charts and maps just read.
“I am able to put information just consumed and lessons learned into my own words and explain somebody else.”	Not at all or almost not	...process information from various sources, using plenty of time and explain some aspects of the content.	...take in information from various sources timely and explain task-relevant content to others.	...absorb and connect information from relevant sources instantly and expound potential problems involved to fulfil job tasks to third parties.
“I am able to write comprehensible and coherent texts.”	Not at all or almost not	...write texts and draw figures that are meaningful to others.	...write coherent texts and draw figures with a central message.	...conceptualize texts and supporting figures providing a central statement and potential applications and interpretations.
“I am able to use key words, highlighting, text sequencing and summarizing for text understanding.”	Not at all or almost not	...use key words to remember, highlight text passages, mark paragraphs and summarize main propositions.	...come up with own key words, highlight relevant text passages, mark important phrases or terms and summarize the main message.”	...pinpoint key words and recall them any time, highlight important aspects and mark key statements as well as summarize the central message and interpretation.
“I am able to use correct spelling, grammar and punctuation.”	Not at all or almost not	...write mostly correct words, use appropriate grammar often and place punctuation marks.	...come up with texts containing only a few spelling mistakes, mostly correct grammar and few punctuation errors.	...devise written statements in an absolutely faultless manner.
“I am able to deal with technical terminology.”	Not at all or almost not	...read and understand technical terminology mostly.	...perceive all technical terms and use them in my own speech appropriately.	...perceive and use all technical terminology perfectly, i. e. using technical language with colleagues and superiors and paraphrasing with customers.
“I am able to prepare a presentation.”	Not at all or almost not	...find some relevant information, sometimes with support needed, and present it in an understandable and visually supported way.	...independently procure all major information, process it and present important aspects in an appealing way.	...gain information and deeper insight into a topic, select interesting and relevant aspects for a given audience and present it in a way that is stimulating and inspiring for the audience.
“I am able to use media to visualize work results.”	Not at all or almost not	... handle some multimedia functions and traditional media (blackboard, flip chart, pin board etc.) to support a presentation	...use several media interactively to arouse interest and support understanding in audience	...make use of several media simultaneously to support major statements and the central message as well as the activate and involve the audience
“I am able to develop possible solutions and alternatives.”	Not at all or almost not	...with some support develop standard solutions to a given problem	...independently develop solutions and potential alternatives to standard problems or slight deviations	...develop standard and creative solutions, even to ill-defined problems

Three major components of a “holistic action competence” for trainees in TVET have been covered so far, focusing on soft skills: **social, communicative and methodological competencies**. Evidently, there are more key competencies that come under these headings—and can be represented in rubrics that are developed by training centers and individual teachers alike. The aim is to help the own student body improve or even to advance competence-based assessment in entire trade courses or for a specific group of learners.

However, there is still one important soft skill component to be dealt with: so-called **personal or human competencies**. An example rubric is provided how to assess and self-assess these competencies in the following specimen:

Sample Competency Rubric No. 3: Personal Skills

Personal/Human Skills	Beginner	Developed Learner	Self-Knowing Individual	Self-Knowing Pundit
“I am able to...”	“I can...”	“I can...”	“I can...”	“I can...”
...develop my own opinion and stand my ground.	...express my own opinion, but without including others' arguments.	...express my own opinion, repeating others' arguments and ideas and partly discussing impact on my own stance.	...stand in for my own viewpoint, be responsive to others' arguments and develop my stance interacting with others.	...represent different viewpoints and give reasons for them, accept and adapt others' ideas and thereby continuously develop my own stance.
...be curious and show interest to acquire new knowledge, skills and abilities.	...only rarely show interest to learn new things, and usually only in certain areas.	...show curiosity and interest to learn new things at times, usually in certain areas that concern me personally.	...often be very interested and curious in the world surrounding me and then eager to acquire new knowledge and skills/abilities.	...always show great interest and curiosity and literally anything new and in any learning activity and also motivate others around me with my learning enthusiasm.
...work in a motivated and focused style.	...work properly only after having been asked to.	...sometimes work in a motivated and focused style, usually in some areas of particular interest to me.	...usually work in a very motivated and focused-on-target style, no matter what the task at stake.	...always work in highly motivated and highly focused fashion, thereby enabling others to stay on track as well.
...show and sustain dedication and own initiative.	...work with dedication only after being pushed and only for a short while in a state of high concentration.	...sometimes work in a dedicated and concentrated style, usually in areas of my personal interest.	...mostly show and sustain dedication and concentration to my work or learning, also initiate some work that needs to be performed.	...show initiative and dedication in everything I do and think should be done, setting an example for others in terms of perseverance and agility.
...correctly self-assess my skills and abilities and take on demanding tasks.	...occasionally show self-confidence in own abilities and potential accomplishments at work. For the understanding of own skills/abilities I need the help of third parties.	...generally take on new tasks, confident to accomplish something positive. Mostly, I judge my skills/abilities correctly, third-party feedback helps still, however.	...self-assess strengths and weaknesses properly. Accordingly, I can take on tasks to fulfil judged adequate for me. To grow professionally, I look for help.	...always show confidence in my skills and abilities to accomplish any task. In case I need support, I am aware of my limitations, ask for help and try to learn from peers, teachers and superiors in doing so.

After the introduction of four sample rubrics, one has realized that **rubrics ideally contain no more than four columns**, i. e. four different performance levels, as it proves linguistically challenging to provide explanations on different levels that are still clearly distinguishable and succinct.

For obvious reasons, competencies develop on a continuous scale, which means that individual learners that are lumped into the same category may still not be the same. They may just about qualify for that level or occasionally demonstrate a performance that could be placed one level up already. Nonetheless, the **levels provide ample feedback and aspiration to climb up the competence classification ladder of a rubric**.

Competence rubric levels, however, cannot and shall not be easily translated into a traditional scale of assessment, such as from 1 to 15 or 1 to 100 points or even the “fail to extraordinary distinction” scale. To this end, competence rubric assessments should be flanked with oral assessments catering to explicit scales (e. g. assessment of a presentation) or with a competence-based test.

Before the section on the fundamental instrument of rubrics in TVET assessment comes to a close, one more example of paramount importance is introduced. The last sample rubric expounds four levels of **technical competencies, drawing on the masonry field as an example trade**. Of course, on top of all soft skills, which are comparable even in many different TVET areas, **technical skills are unique in any course, and therefore multiple rubrics for different occupations and trades must be developed**, containing the competencies as laid out in the relevant curricula.

QTA Key Insight No. 55:

While **competency rubrics describing soft skills can be used in most trades** and courses, technical competencies are unique to each sector and specific course in TVET so that **rubrics dealing with technical competencies must be developed anew** more often than not. But as a team effort, the development of new rubrics is manageable and worth the commitment.

The example below establishes **a model of a rubric for the mason trade**, apparently only for a few **selected technical competencies (Sample Competency Rubric No. 4)**. It still gives the gist and provides a prime example of how to devise rubrics for technical competencies.

Sample Competency Rubric No. 4: Technical Skills

Technical Skills for MASONS (NVQ Level 4) “I am able to...”	Not yet competent (Level 0)	Absolute Beginner	Craftsperson	Top Performer
...select and arrange the appropriate tools, equipment and materials.	I cannot do that yet.	I can select and arrange tools, equipment and materials needed, if instructed meticulously.	I can select and arrange tools, equipment and materials for any masonry task at hand.	I can select and arrange tools, equipment and materials very quickly, also for unforeseeable problems during work—and instruct others what to do.
...prepare cement mortar according to the type of the masonry work.	I cannot do that yet.	I can prepare cement mortar if exactly told how and supervised as well as being told what for (e. g. rubble, brick or block work and sub-types).	I can prepare the exact amount and composition of cement mortar for any type of masonry work.	I can quickly and professionally prepare cement mortar needed for all typical masonry tasks as well as atypical situations (e. g. more cement mortar quickly needed), and train others how to do it.
...build rubble supporting walls.	I cannot do that yet.	I can use rubble to build walls, if exactly told how to process the rubble and being supervised.	I can build rubble supporting walls on my own in different types (e. g. gabion wall, random rubble wall, coarse random rubble wall, pointed rubble wall with spaces, pointed rubble wall without spaces).	I can build any type of rubble wall with ease and in high speed as well as show it to and supervise others—and check for high quality afterwards.
...construct brick walls.	I cannot do that yet.	I can use bricks to build straight walls, if exactly told how to do it and being supervised.	I can build brick walls independently in straight and differently angled fashion in different types (e. g. stretcher, header, English, Flemish, French bond etc.).	I can build any type of brick wall with ease and high speed as well as show it to and supervise others—and check for high quality afterwards.
...cast concrete building components.	I cannot do that yet.	I can mix concrete and use it for building components, if instructed in details and supervised.	I can mix concrete by hand and machine, choose between plain, aggregate and reinforced concrete and perform different tasks (e. g. reinforcement for foundation, beam column, slab, paving slab and stair case etc.).	I can mix concrete and choose different types according to the task at hand quickly and accurately, train and supervise others in concrete work and check for high quality afterwards.
...make use of building drawings.	I cannot do that yet.	I can read building drawings and make use of it if helped and guided.	I can read and interpret and type of building drawing, and implement the instruction in my masonry work.	I read and interpret instantly as well as draw building drawings myself. I ensure that they are used, instruct others how to use them and check if the implementation is in accordance with specifications in the drawing.
...	...	...	...	...

Obviously, there are more competencies a mason needs to possess to live up to the demands of full craftsmanship.

And there are surely more steps in between a beginner, a craftsperson and a top performer levels, which may possibly be put into words. Then two more columns would have to be introduced. However, **even by using this sample rubric, any trainee and employee in masonry can self-assess and be assessed by a third party in which column for any given competency she or he lies**, as well as rather closer the upper or lower border of that level. **According to this, development goals can be established.**

Competent instructors in their fields of expertise should be able to construct such rubrics, facilitating continuous assessment, self-assessment and more generally competence-based assessment a great deal.

Key QTA Insight No. 56, following the introducing competency rubrics:

Any lecturer or instructor should be **able to devise competency rubrics in the own realm of teaching for technical competencies**. This way continuous assessment and self-assessment as well as consistent **counseling of learning can be facilitated tremendously**.

Follow-up Insight No. 56a:

Rubrics **propagate competence-based assessment in TVET** and focus on achievements and abilities or skills that still achievable.

Follow-up Insight No. 56b:

Luckily, soft skills or **key competencies** to succeed in the job and in life in general **are pretty universal**, which means the **examples given** in this chapter **can be used in many TVET courses and occupations** as well as differing levels (e. g. several NVQ levels). However, they **can be fine-tuned, supplemented or concretized** by an institute or teacher according to specific groups of learners if deemed adequate.

8.3.2 Selected significant assessment instrument No. 2: Reflective Learning Portfolio

Reflective Portfolios are the **most elaborate reflective assessment and counseling instrument** these days. Even though portfolios can still be very diverse, **ranging from shiny presentation portfolios**, containing best practice and success stories only, **to truly reflective portfolios** that dwell on development needs and reasons for mishaps in the learning process as well and pronounce how to improve on competence acquisition needs of portfolio's owner, i. e. the learner, that remain and might make sense.

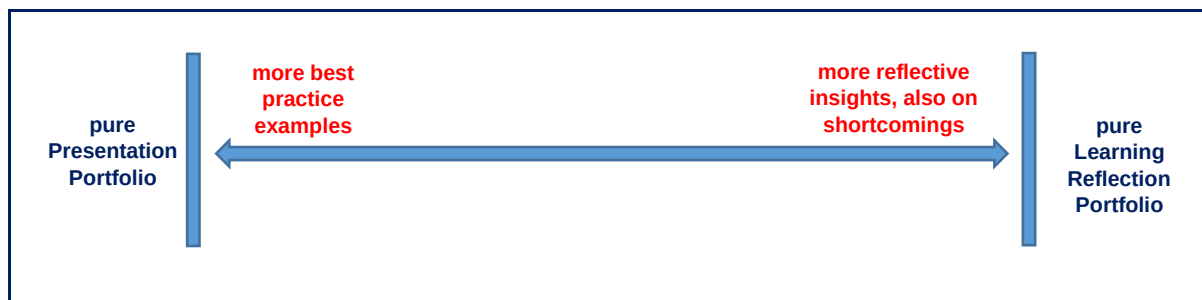


Figure 43: Continuum of options of portfolio design

Ultimately, it is **essential to employ reflective portfolios in TVET**. Presentation portfolios are prepared mainly by artists and architects to convince customers or for job applicants to convince potential employers of their abilities. In TVET, it is equally important to highlight learning needs still, and sketch the path towards an aspired competence goal ahead. So, in any learning process, **reflective portfolios are the proper choice**,

That is why the main characteristics of that type of portfolio are laid down.

Reflective Portfolios generally come in the **forms of folders, dedicated note books or similar note-taking options**, allowing for substantial entries and **material to be added, such as sketches, drawings, graphs etc.**, or even recordings and digitally stored data, e. g. on flash drives, CDs/DVDs or codes for access to cloud-based storage systems.

At that point, it has to be pointed out that **there are effective e-based portfolios** these days as well. They have many advantages, such as data continuity and access, topicality and formal style, capacity and long-term usage.

Pragmatic QTA Hint:

For further information on e-based portfolios, please consult the very informative following web addresses:

<http://eduscapes.com/tap/topic82.htm> or

<http://www.elearning.tki.org.nz/Teaching/Assessment/e-Portfolios> .

It also make sense to tap into the background of e-portfolios and why to use them (cf. Loane 2014).

Pragmatic QTA hint:

TVET teachers might want to work with freeware programs that can used with students:

e. g. <http://freeportfolio.org> or

<http://designinstruct.com/roundups/free-online-portfolio> !

But there are also disadvantages of e-based portfolios: If access to net is not available, cloud-based storage and retrieving is perturbed and interferes with a seamless teaching and reflection process. Of course, e-portfolios can be locally stored on hard drive or even flash drive as well to avoid being dependent on Internet connectivity.

Moreover, it is **fairly cumbersome to include spontaneous** and hand-written product such as drawings, graphs and scribbled notes, as that would require extra software to turn into digitized version. Digitization takes more time for most non-expert users, such as a plethora of TVET students.

Therefore, **TVET teachers should experiment with e-based and hardware portfolios**, and see what best fits their needs.

When it comes to the usage of this instrument of reflection, **students must regularly make entries into their portfolio**. It should be a routine to take a reflective note at the end of each formal training session, and the teacher should ask for it constantly, **to engender reflective and deeper learning thereby**. Also, students should be encouraged to make entries after practical experiences every day, during internships, OJT or formalized industrial training. **Company trainers and supervisors should be instructed by TVET teachers how to employ reflective portfolios in TVET**.

One **major difference** to other assessment and reflective instruments is that it is **more extensive, i. e. can include work artefacts** such as work results (e. g. pictures and technical drawings), trainer and peer feedback outcomes and other confirmations about externally acquired, but relevant competencies. Another difference is that portfolios are always open to third parties, especially teachers and company representatives for the continuous purpose of learning counseling (formative assessment) and for final assessments of competencies acquired. On this account, **teachers and students should jointly come up with criteria of compiling portfolios according to which they will be graded**.

The following sample criteria can be considered a solid foundation for fair and transparent assessing, the more operational the criteria are the better:

- **formal criteria**
- **criteria for true reflection**
- **evidence criteria.**

The criteria can be collected, discussed with the students and displayed in a matrix. The weighing factors have to be agreed on.

The following example shows how a result for a portfolio assessment matrix may look like:

Criteria for Portfolio Assessment	Degree of “targets reached”				
	Failed				Excellent
Correct content					
Technical terminology					
Style of language					
Formal aspects: orderly, table of contents etc., clearly arranged					
Form of language (grammar, spelling, form of expression)					
Design: creativity, graphic illustrations, pictures, digital components, cover style etc.					
Attachments: quality and relevance					
Reasoning for the selection of evidence					
Diligence and proven Interest					
Critical reflection of Competence Development					
Inclusion of 3 rd party feedback and reflection thereof					
Final appraisal (concise in bullet points)					
Final Grade:					

Figure 44: Sample assessment criteria matrix for reflective portfolios

For reasons of differing degrees of importance and workload involved, the selected criteria must be weighed, e. g. 30 % for “critical reflection of own competence development” and 20 % for “inclusion of third-party feedback and reflection thereof”. The remaining 50 % could be distributed amongst the remaining nine other criteria, with the chance to form other focal points of portfolio-based reflections of learning processes and outputs. The **higher weight for criterion on “critical reflection”** should be considered a *fait accompli*, and not called into question, as it makes up one of the main pillars of reflective learning portfolios. Teachers should insist on that weight for reflection, while giving some leeway to the students with regard to weighing other criteria. Naturally, students may come up with further criteria as well and cancel others they do not like in any given group of learners.

Teacher can accommodate while insisting on the reflective nature of the instrument.

Physically speaking, portfolios can actually look like the example provided below:

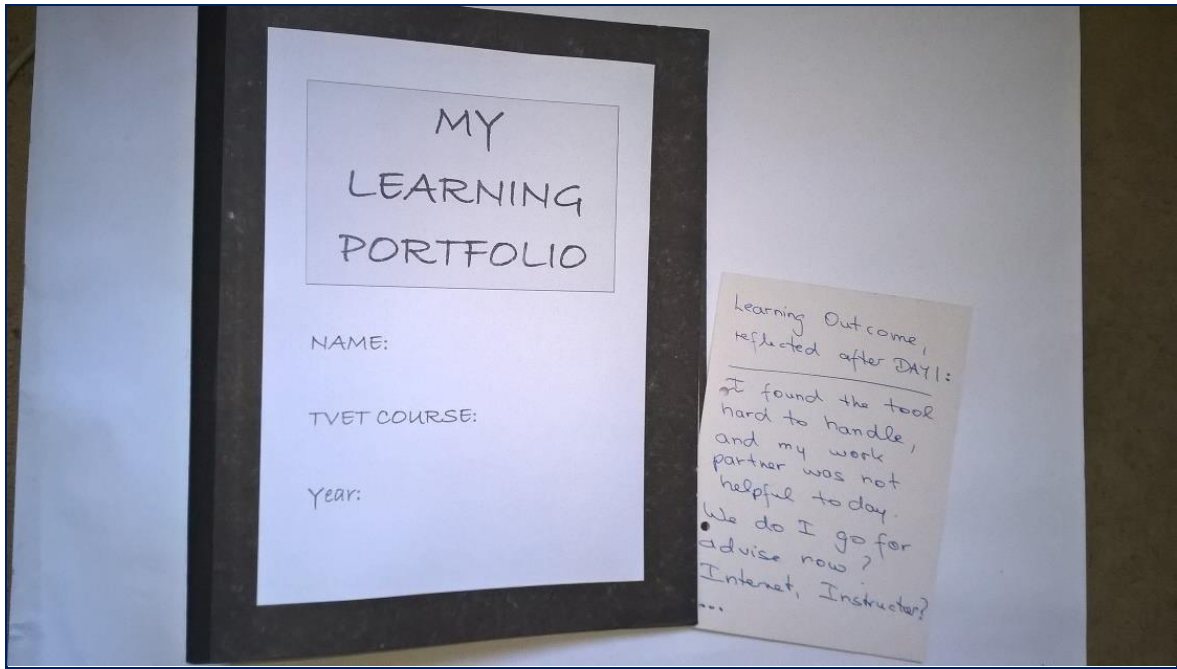


Figure 45: Potential appearance of a learning portfolio

A potential entry may look like this:

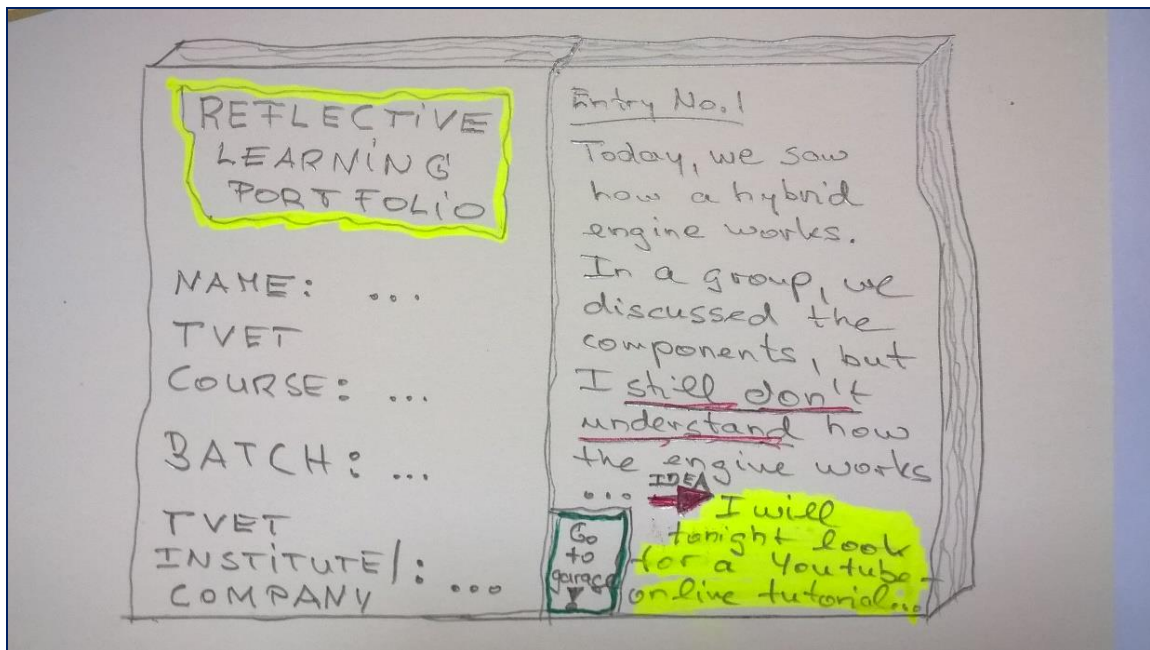


Figure 46: Potential reflective entry into a learning portfolio

Portfolios are generally **more comprehensive** than scribble note pads and learning diaries. But TVET teachers are well advised to limit the number of page allowed, as they are supposed to grade the final version—and reading plus assessing, say 150 pages, multiplied by a large number of students takes a long time, and will prove uneconomical.

Accordingly, a suggestion would be **limit the scope of a portfolio to 30 to 40 pages** at the end of the course, for example by encouraging students to extract older portfolios artifacts and entries that have been superseded by new learning and teaching experiences. Such topics will have to be covered in the portfolio anew and the redressing of older shortcomings or development have to be pointed out. The learning process can still be elaborated, but the steps, goals and older material can be taken out and replaced, to adhere to any given page limit.

QTA Key Insight No. 57:

Reflective Portfolios should be a **part of the generally employed reflection and assessment kit on any teacher in TVET**, thereby promoting enhanced learning and individual assessing of relevant competencies.

But the **scope of the portfolio instrument should be restricted** (e. g. 30 to 40 pages) to preserve economy of means.

8.3.3 Observation and Appraisal Sheet

A wide range of contemporary teaching and learning in TVET is characterized by long teamwork phases and ensuing presentations of some sort. Obviously, such **phases and “products” of group work have to be accessible to assessment** as well, as they cannot be out of reach for the teacher to make use of it for assessing progress and performance. The reason for this is that it would be an oddity if some parts of student learning strengths and issues were beyond assessment means.

However, it has to be acknowledged that one is approaching mostly uncharted territory in TVET, trying to assess teamwork objectively and fairly.

QTA Key Insight No. 58:

Individual contributions to teamwork processes and products or to team presentations are still **rarely assessed**. However, a fair and all-encompassing system of assessment must cover all major aspects of the teaching-learning cycle as well as team products!

At this point, teachers and students have to be aware of the fact that **teamwork can only be assessed properly by cooperation between teacher and students** as well as by fairness prevailing among students at the same time. The reason is that teamwork can only be meaningfully and adequately observed and judged by students themselves. Against this background, they should be asked to self-assess their contribution and performance, using the same instrument as their teacher.

In the end, teacher and student get together and exchange assessment viewpoints, starting with the self-assessments and agreeing on a final grade for individuals—naturally, teachers has the final say in case of lingering disagreement. However,

there may be a group proposal as well, since group members can be asked to “distribute” their final mark for the entire group (e. g. for a project report and/or a group presentation). How this can be done in a methodical manner will be covered as follows.

From a purely theoretical perspective it is hard to see how to pull off an individual assessment relying entirely on team performance. That is why an example introduce of an observation sheet for individual performance during team work phases is introduced:

Observation Sheet Individual Contribution Teamwork					
Name of Team Member:		Course:			
Time & Date of Observation:		PLEASE TICK: ✓			
Observed Team Competencies:	Sample Observations / Evidence:	brilliant	decent	acceptable	improvable
The team member consistently works towards setting targets, following up continuously and reaching such targets.					
The team member is always focused and concentrated, and motivates others to act likewise.					
The team member helps to establish team rules, sticks to them consistently, enforces them and influences others to do the same.					
The team member works in a constructive manner, communicates consistently with others, asks for advice and provides his opinion in discussions without holding others back.					
The team member proves technical understanding, improves in the process and applies abilities and skills, in coordination and cooperation with others.					
The team member is consistently cooperative, supportive and open to compromise.					
The team member is able to learn from mistakes and is reasonable with respect to critical feedback.					
The team member has learned from prior group work—and applies these new team skills.					
The team member recognizes shortcomings in own team-based actions, reflects them and comes up with adapted behavior. (If not observable, consult individual reflective portfolio!)					

Figure 47: Teamwork observation sheet for individual contribution as an assessment Instrument:

If the term “team member” is replaced by “the team”, the observation sheet provided above can be used for assessing group performance as a whole as well, only with minor adaptations.

For a final grade, it has to be a preconcerted arrangement if the observed criteria are of equal weight, or if certain aspects of teamwork are to be treated differently. Based on such an agreement, a final grade can be awarded—not to be forgotten that the assessed student presents a self-assessment first.

QTA Key Insight No. 59:

There is an assessment instrument for **individual appraisal of teamwork contributions: ready-made observation sheets** for that purpose. They have to be filled out by assessed and assessors alike, then discussed, specific observations weighed and a final grade agreed on.

In similar fashion, team presentations can be observed and individual contributions isolated and assessed. Before applying such an assessment instrument, however, the group has to be asked to prepare a separate section of the presentation for each group member.

The following example provides a prototype for such an **observation and grading sheet for individual presentation performance** assessment as part of a group presentation:

Criteria of Assessment – Presentations

Content:

all aspects correct
no false information

Distributed Grade:
[Weight 30%]

wrong explanations
lots of false information

outstanding

all relevant parts covered; contexts well understood

relevant parts ignored; contexts misunderstood

poor

Media & Hand-Out:

visualization well-designed to support understanding
no mistakes/difficulties in design & application

Distributed Grade:
[Weight 30%]

chaotic media application
not fine-tuned to topic

outstanding

Hand-out/Advance Organizer contains important
message/content in a clear & structured fashion

Hand-out or Advance Organizer chaotic/not available/
not adapted to the questions or intended content

poor

Oral Performance:

sophisticated language; elaborate & rhetorically impeccable speech,
fluent speech, technical terms correctly applied

Distributed Grade:
[Weight 40%]

poor language (grammatically & lexically)
OR all read from blueprint/notes

outstanding

speed of speech adapted to presentation situation; proven understanding
of topic; flexibility to answer question (of teacher or fellow students) &
deal with them adequately; posed questions of comprehension to audience;
open body language; eye contact with audience

wrong usage of technical terms, unsure of
him-/herself; questions ignored, inflexible,
closed body language; no/wrong eye contact,
understanding of audience of minor importance

poor

Figure 48: Presentation observation and grading sheet for individual group contribution as an assessment instrument

In many cases it proves difficult to isolate individual group contributions. In such instances, teachers grade the entire teamwork process and products—and ask team members to allocate a certain percentage of the grade to each team member.

Evidently, team members have to be educated in a way to accept such an assessment measure, to be fair to one another and respectful. **Only in such a positive and trustful atmosphere of learning, a teacher should ask groups to allocate shares of group achievements amongst one another.**

For example, a group of three decides to allocate the success of teamwork according to the following distribution:

Team Member A: 25 %

Team Member B: 50 %

Team Member C: 25 %.

As a measure to promote and encourage openness and fairness, teachers can promise not to downgrade the team grade for any team member, but only to upgrade if deserved.

In the example given above and a team grade of, say “distinction”. The teacher could upgrade the performance of team member B to “extraordinary distinction”, if overlapping with own impressions. That quality check with primary observations of the teacher may avoid cheating that might be reciprocated one day.

QTA Key Insight No. 60:

Asking team members to **allocate a fair share (i. e. a percentage) to team members** for creating a holistic team performance is a particularly **sophisticated method of assessment**. Individual team members’ grading can be altered accordingly.

Such a method fosters a fair team spirit and mutual recognition of individual team members’ performance. It prevents discouragement for outstandingly able and motivated team members and may even encourage and motivate others to emulate high-achieving group members.

Author’s Vote: Please give this assessment method a shot. It is a very deserving method in the context of competence-based assessment and essential teamwork!

8.4 Summative-only assessment instruments

8.4.1 Selected significant assessment instrument No. 3: Competence-based tests

A test is probably the classical instrument No. 1 in assessment—and will mostly likely never lose its appeal to teaching personnel and students alike, the former looking for a tool that allows objective appraisal and the latter asking for clear-cut and easy-to-interpret feedback.

Let us first draw a line between **scientific tests and traditional tests**. While **scientific tests** have been put through intense scrutiny by means of item analysis, pre-testing and quality criteria evaluation—which induces re-designing, canceling and newly creating items to a considerable degree until living up to scientific standards (e. g. reliability > 0.8)—, **traditional tests** are designed for everyday purpose by teachers and assessors according to their best abilities, usually without prior or *post hoc* checking for quality. For that reason, teachers' testing approach needs to follow minimum standards when designing tests.

Key Insight No. 61:

Because **teachers' and assessors' quotidian tests do not comply with scientific item and quality checking**, but they still have to live up to **certain designing standards as a minimum requirements**, i. e. fulfilling the **conditions of competence-based testing** and fairness.

Despite a multitude of drawbacks that are expounded later, tests constitute important tools in the assessment kit of any teacher in TVET. However, it is essential not to repeat major blunders in testing of the past and to employ **competence-based testing**.

A consortium of expert assessors, competence professionals and top-notch researchers, under the auspices of the OECD, has come up with a competence-based framework for tests that is put to work in the international comparative educational study, called *Programme for International Student Assessment* (PISA) for 15 to 16-year-olds.¹¹

For our purpose, we introduce the assessment framework first:

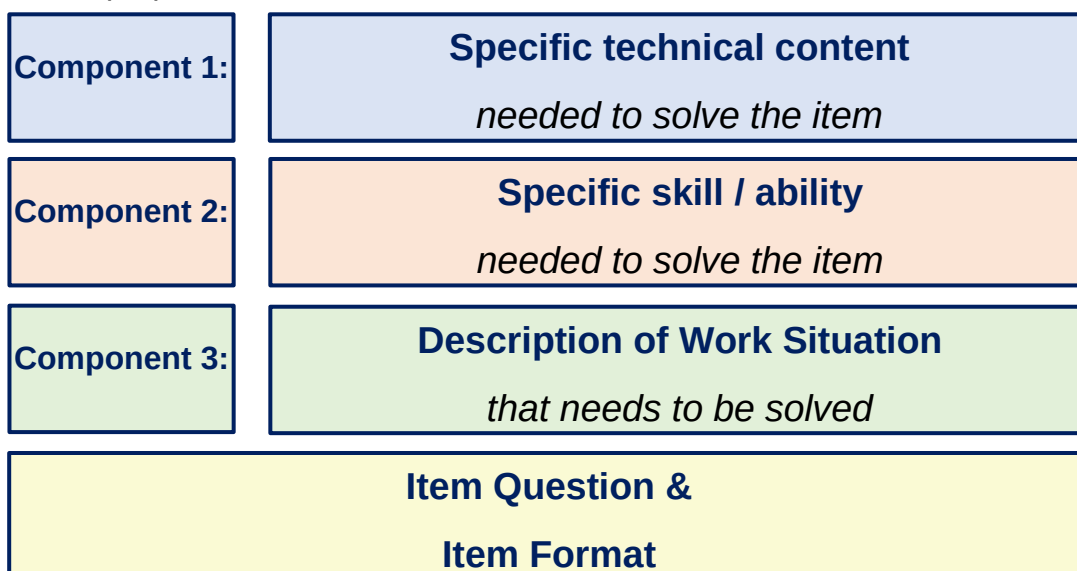


Figure 49: Assessment framework for teacher-made tests

¹¹ For the interested reader in the PISA concept, obtain further details and results by consulting the comprehensive homepage of the program: <http://www.oecd.org/pisa>.

The model assessment framework mirrors the components of the competence concept, i. e. **each test task contains an aspect of content knowledge needed to perform, the relevant skills or abilities representing a cognitive process for work that must be put to action in a vocational context**, i. e. the work situation in which knowledge and skills ultimately prove their worth.

The **described situation in test items** fine-tunes the level of difficulty of the item, ranging from easy routine tasks to complex exceptional work problems. That description of a **situation is a must-component in test tasks**, isolated knowledge questions are taboo.

On top of that, there has to be a decision made on the **answer format of the item**.

Standard formats are:

- **Simple multiple choice** items: Students have to pick one right option how to deal with the work situation described given for the item. Usually, there are four to five options given. To minimize success through coincidental picking, five to six options make sense, even if items with more distractors (wrong choices) are more time-consuming to construct.
- **Complex multiple choice** items: Students may select as many options as there are possible ways to deal with the work situation described in the item. The numbers of correct solutions may range from one to all options. Complex multiple choice items reflect more complex work realities more closely.
- **Closed constructed response** items: Test-takers have to come up with the proper answer all alone, but there is only one answer possible. Frequently, such items may consist of labeling graphs or diagrams, visualize something or fill in a blank space.
- **Open constructed response** items: Test-takers explain their solution and their way of dealing with the given work situation in detail. Usually, even the length of the answer is open-ended and the expected solution is in word-wrapping and entirely text-based. In contrast, the variation of **short constructed response** items are a certain type of open constructed items, usually including a restriction of words, space and time for the response expectations.
- **Semi-open constructed response** items: Part of the expected work procedure in the answer is standardized and given by default in a pre-defined manner (e. g. a work flow chart), while some aspect can be freely substantiated without a set of prior given standard solutions.

Practical QTA Hint:

It makes sense to base a test on a number of **easy-to-correct answer formats** as well, in order to secure the **quality criterion “economy of testing”**.

Well-devised and conscientiously construed multiple choice items also fulfil their purpose of competence-based testing, if the options generally describe work actions.

Please take note that in multiple-choice questions, the answer options always specify work activities, embedded in knowledge-driven proceedings.

Practical QTA Hint:

Wrong options in multiple choice items **are called distractors**. Distractors are best if they mislead incompetent or little competent test-takers, but do not fool competent ones.

There should be a few test questions with really tough distractors that even fool average competent test-takers in order to make them accessible only to super-performers **to identify extraordinarily competent students**.

Key Insight No. 62:

It is a recent and important finding in assessment that the structure of good competence-based and performance testing of students **is never a result of culture**, i. e. making the case against claims that purport that certain types of tests, or teaching for that matter, do not work in specific countries or locations. Therefore, the **argument around cultural reservations about certain types of testing is null and void** (cf. Crehan 2016). That fact carries some weight, given wildly different TVET systems and cultures around the world, comparing for example Asian and European cultures and approaches to TVET.

Test answers principally contain work actions. Pure knowledge is never asked for, which means competence-based test item questions ask for skills and abilities, comprising some necessary background knowledge, that materialize in situational coping of work-life tasks and problems.

That may well sound somewhat theoretical, but the following examples highlight what is meant by competence-based test items.

Let us start with an item that **does not live up to the demands** of modern testing:

Test: Mason Trade	Trainee Name: _____
National Vocational Qualification: Level 4 (Craftsperson)	
Date: _____	
Name of Trainee: _____	
Question No. 1: List five methods how to make a wall in a new building!	

...	

The problem with this item should be crystal-clear. Trainees only need to learn the technical terms for the methods by heart. To get full credit, **it suffices to engage in rote learning**, with no skills and abilities needed, aside from the potentially useless ability to memorize something and **repeat like a parrot**. Such knowledge does not support any capability to perform or even solve problems in work life. Neither any job-relevant competency is asked for, nor anything of value to future employers proven.

QTA Key Insight No. 63:

Rote learning is taboo in TVET, so is asking for isolated facts and knowledge only in tests!

So why would a teacher ask such knowledge questions without context?

To answer that questions, let us look at **one more example to extrapolate the uselessness of knowledge-only test questions**, as employed in *extenso* in the past.

Final Test for Trade: Secretarial Practice		Name: _____
Course:	One-year Center-Based Training Course	
Date:	_____	
Name of Trainee:	_____	
Question No. 1: Name and explain three shorthand system (6 points):		

...		

From a competence-based training point of view, one may ask why a secretary must know more than one system of shorthand, and, yes, **basically only know the technical terms** (presumably three points already on the answer scale) and what they are based on (e. g. geometric or script shorthand).

That does not make sense. Even if an aspiring secretary can answer all that, and most likely awarded six points, perhaps leading up to the best assessment possible. At that point, nobody knows if the secretary can actually perform any shorthand, neither if the testee is critically aware of the reduced and limited usage of shorthand in modern days as well as when usage of shorthand might still make sense.

So the following example provides an alternative and sets a standard:

Final Test for Trade: Secretarial Practice

Name: _____

Course: One-year Center-Based Training Course

Date: _____

Name of Trainee: _____

Question No. 1:

“Mentally analyze your workplace and come up with two work situations in which the application of shorthand is still meaningful. In addition, discuss potential applications critically. Your superior wants to know from you!” (4 points)

Answer in no more than 10 lines or 150 words:

Question No. 2:

“Your boss calls you in and would like you to type the following e-mail immediately. He speaks very fast, is in a rush, so you decide to take notes via shorthand before turning it into a mail to be sent:

“To our supplier Weerasinghe Ltd.:

We do actually need the delivery a day earlier. This is an urgent matter, as we might get into trouble with our best customer otherwise.

Do you think you can comply?

We would appreciate that very much!

Best regards

George Sanaratne

Director General”

Please write it down in shorthand within one minute:

What is the difference between the two tests?

The first item asks the test taker to imagine work situations in which shorthand skills can still be employed, and also to question the usage of shorthand critically. These

are very relevant issues for employers. The format is open response, and therefore rather difficult to assess, as potential work situations are unlimited.

The second item directly asks testees to perform a work-based action, in a closed constructed response format.

But both items include a work situation and application of knowledge and skills, i. e. are competence-based. In comparison the previous example test questions ask for **inert knowledge, not relevant or obsolete at work**, while a competence-based test question checks for directly applicable technical skills, problem-solving and critical thinking reflections.

For deeper understand, the following examples allows to analyze the **difference between old-fashioned knowledge-based and modern competence-based testing** once more:

Test: Kindergarten Teacher	Name of Trainee: _____
Course:	18-month course, 2 nd Semester
Date:	_____
Name of Trainee:	_____
Question No. 1: Who was Maria Montessori and when did she live (2 points):	

Question No. 2:	
A four-year old child is in which one of Piaget's stages of cognitive development? Please tick the right answer: (2 points)	
① The sensorimotor stage	
② The formal operational stage	
③ The concrete operational stage	
④ The preoperational stage	
...	

Just for the record, what is to be seen above is a closed constructed response and a simple multiple choice format, but **the answers can be given by simply learning presented information by simply memorizing facts**, a far cry from evidence for competence. Any person that can answer such questions perfectly, and consequently succeeds in the test, is quite as likely to be completely unfit to apply Montessori pedagogy in a kindergarten or make use of learning tools adequate for children in the assumed Piaget's preoperational phase of child development.

So how would a competence-based test look like in contrast? See the following example:

Test: Kindergarten Teacher	Name of Trainee: _____
Course:	18-month course, 2 nd Semester
Date:	_____
Name of Trainee:	_____
Question No. 1:	
“You started work in a Montessori Kindergarten at the beginning of the coming month. Right in your first parent-teacher talk, the father would like you to give him two examples of how you work with his 3-year old daughter that makes your place especially Montessori-like, in contrast to another Kindergarten.” (2 points) _____ _____ _____	
Question No. 2:	
“You would like to play with your group according to the proper stage of Piaget’s cognitive development ladder?” (2 points) Please tick the right two actions that live up to expectations during that stage of development: (2 points) ① I’ll do a role play with them where they will have to take the position of other children. ② I’ll invite them to pretend playing typical situations in life, e. g. selling and buying things. ③ I’ll have a little sit-in and make them discuss what a next logical step in game they just played is. ④ I’ll ask the children to name objects that are in their vicinity and ask others to identify the object. ⑤ I’ll mainly ask them to touch many objects and relish the sensory experience. ...	

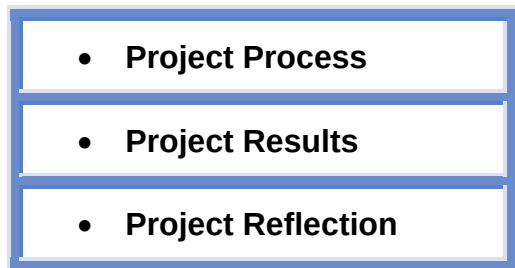
The first item describes a potential work situation, and asks the test taker to demonstrate knowledge and communicate abilities, while the second one implies the knowledge of the implications of Piaget’s theory for actual playing with children in the workplace.

While the former item stands for an open constructed format, the second one conforms to a complex multiple choice format, and proves the point that **carefully designed closed items can also measure competencies**.

8.4.2 Selected significant Assessment Instrument No. 4: Project Report

A **project report** documents the process and the final product as well as the “lessons learned” from a project. As the project method has been dubbed the “**silver bullet**” of **competence-based**, student-centered and action-oriented learning, tracing its origins to TVET (cf. Knoll 2014), **assessing project work has become a foremost task**.

Actual project work going on is hardly accessible to assessment, aside from process observations by students and teachers on criteria-based sheets that can be compared and a final grade negotiated for each individual group member (see section on observation sheets as an assessment method). That is why **project reports take precedence** over other approaches when it comes to assessment. For that reason, teacher and students have to **agree on the set-up and the assessment criteria for project reports**. Depending on the type of project, there may be considerable differences, but the trichotomy of



may have universal appeal and worth in the set-up of project reports.

Therefore, it is recommended to ask for **these three sections of project reports as minimum requirements**. Each section may have different criteria of assessment. Some sample criteria can be introduced to make use of:

Section 1: Project Process

Assessment Criteria:

- Time line and work meetings displayed
- Key turning points and events documented
- Group decision-making and decisions taken as well as objectives expounded
- Planned project proceedings visualized
- Compliance with schedule and deviations including reasons delineated
- Process problems and stop-gaps identified and depicted
- Team cooperation process disclosed

Section 2: Project Results

Assessment Criteria:

- Product existing proven (e. g. by pictures, videos in case of a service or role play etc., written version, leaflet, brochure etc.)
- Quality of Product (e. g. exactness, authenticity, sustainability, correct size, finished timely etc.)
- Comparison of project goal and final product
- Well-researched reasons for deviations
- Contributions of all team members visible and explained in detail
- Cost-Benefit Analysis
- Time-Quality Analysis

Section 3: Project Reflection

Assessment Criteria:

- Failures highlighted and reasons scrutinized
- Achievements pointed out and reasons for successful job identified
- Teamwork shortcomings and successes identified and reasons carved out
- Teams' abilities and knowledge questioned and suggestions for upgrading of competencies provided
- Recommendation for (a) smoother work process, (b) product of higher quality and (c) more effective team work provided
- "Lessons learned" from the project for future work purposes (a) for the team in its entirety and (b) for each team member individually

Supplementary general criteria may be:

- Agreed-on form used
- Correct spelling and punctuation
- Appealing visualization and illustration of statements
- Agreements on scope, spacing, font size and type, quoting etc. heeded
- Creativity and originality of layout
- Hand-in and work period observed
- Process counseling made use of and advice / hints incorporated
- Different group members role and contribution visible or explained etc.

So the final project report layout may look like the following specimen:

Final PROJECT REPORT	
Topic:	"Advertizing technological advantages of the new generation of e-cars to private customers by low-cost means"
Trade:	HYBRID and E-VEHICLE MECHANIC
Project Team Members:	...
- Page 1 -	
CONTENTS	
1.	PROCESS of OUR PROJECT
...	
2.	PRODUCTS of OUR PROJECT
...	
3.	REFLECTION of OUR PROJECT
...	
- Page 2 -	
Foreword	
The circumstances of our project were ...	
...	
- Page 3 -	

Figure 50: Template of final project report

In due course, professional teacher compile an assessment statement, taking all agreed-on criteria into consideration. Such a feedback form can take the shape of a table for reasons of economy, followed by some final assessment statement and the grading verdict. Such a feedback shall be exemplified by the following sample assessment:

Feedback Form for Project Report				
Team No. 2				
Topic: "Advertizing technological advantages of the new generation of e-cars to private customers by low-cost means"				
Date: ...				
Teacher: ...				
Tendency:				
Section 1:				
Work meetings		✓		
...				
Section 2:				
Product Quality			✓	
...				
Section 3:				
Recommendations			✓	
...				
Final Statement: Dear Team 2, I have read your report with great interest. I'd like to complement you on your accurate compliance with our form requirements, your spelling and punctuation as well as your innovative design. When it comes to section 1, your work meetings have been well documented and the results and proceedings become clear. However, the need for the reported frequency and number of meetings remains obscure. Although, personal input of group members remains unclear. ... In Section 2, thanks to the pictures of your final products, i. e. your poster and your billboard, your results stand out. They are acceptable, but in a modern age, hand-writing and drawing does not seem appropriate. Why didn't you use the computer and plotting, for instance? When it comes to Section 3, I realize, you came up with quite some recommendations. But they do not refer to the shortcomings of the product and the teamwork intentions you have identified later. Why? ... Final assessment: You seem to have achieved a workable team spirit—and your team came up with two presentable products, all within the given time frame and by sticking to our rules. Moreover, your final report is prim and lives up to formal rules, mostly. ... I can truly observe some competence growth in you, with some room to manoeuvre upwards... Altogether for summative assessment, the group grading is: MERIT Signature of teacher: <i>Markus Bochner</i>				

Figure 51: Sample assessment statement about final project report

Of course, such an assessment statement looking into a project report only covers group performance and assesses competence improvements for the entire group.

For individual assessment during team work in general and during project work, only observation sheets for the individual, process-based or presentation-based, will provide help.

8.5 Formative-only assessment Instruments

Traditionally, tests represent the standard mode to measure learning output. There is nothing wrong with that method of assessment, as long as the test items are apt to measure competencies and not knowledge only (see the previous section).

However, there is a **number of drawbacks** for tests that do not make them the method of choice for a more pronounced competence-based assessment approach that puts a focus on fostering development in students. The disadvantages of tests include:

- **one-size-fits-all approach**, i. e. tests are not individualized and cannot shed light on individual specificities.
- **point-in-time approach**, i. e. tests cannot indicate developments over time.
- **tester-focused approach**, i. e. the teacher coming up with the test determines what performance is to be shown, test takers follow instructions only.
- **standardized approach**, i. e. a certain number of percentage points stand for a certain level of pre-determined competence categories.
- **standard-solution approach**, i. e. a teacher works out the answers to be expected before tests are being taken.

From an academic point of view, these “drawbacks” can also be advantages, as they facilitate certain quality criteria of assessments such as objectivity, reliability, validity and time-cost effectiveness of measurement.

However, tests cannot provide evidence with regard to individual acquiring of competencies and specific levels or achievements. **Traditional testing does neither allow for nor encourage new innovative ways to solve problems, nor outstandingly thoughtful or quick methodologies.**

All these drawbacks of traditional testing can be overcome by written instruments of reflection that are **ready-made for formative as well as summative assessment.**

QTA Insight No. 64:

Written instruments of reflection can overcome disadvantages of traditional testing and are perfectly adequate to conduct formative and summative assessment.

There are **three general types of instruments of reflection**, dubbed as such according to their level of formality:

- (1) Reflective Scribble Note Pads
- (2) Reflective Learning Diaries
- (3) Learning Portfolios (see section 8.3.2).

All three can be put to good use in TVET, but one needs to be clear about the objectives, possibilities and limitations of the three types.

8.5.1 Selected significant assessment instrument No. 5: Scribble Note Pad

Reflective Scribble Pads are essentially very individual note pads, tablets, empty booklets or folders that are set aside for taking notes before, during and after formal teaching and learning in class or on the job in TVET. They are characterized by a **large degree of learner's choice when it comes to how they look like, when and how often they are used**. The major distinctive feature is that reflective scribble pads should not be used as a source of official final assessment because no criteria, neither formalities nor for proper content have been agreed on. The owner of the scribble pad can even freely decide if and how much third parties such as peers, teachers, employers and even parents can have a look into it. For example, only certain parts or entries can be disclosed for scrutiny.

Pragmatic QTA Hint:

Reflective Scribble Pads feature the following **characteristics**:

- They physically come as note pads, folders or small booklets, self-designed
- for taking individual reflective notes
- before (expectations), during (reflection phase) and after (homework) teaching or OJT.
- They are not to be used for final assessment, (too individual without binding guidelines)
- allow unrestricted learner's decisions whether or not to share content with third parties and
- can be a source of learning counseling and continuous assessment. (the latter only for certain entries for which criteria of preparation have been agreed on)

As a result, the instrument is suitable for counseling if disclosed at some point, i. e. potentially a **good source of individual formative assessment**. It is less compelling for final assessment, unless of the counseling kind. It is one of the least regulated assessment instruments but popular with learners once introduced and ritualized.

When it comes to learning effects, it can be quite effective if put to work regularly to become aware of what has been learned and what still needs to be done—all of it in a fun and free-wheeling style, **largely determined by learners**.

To provide an idea this is how the instrument may look like, two examples are presented below:

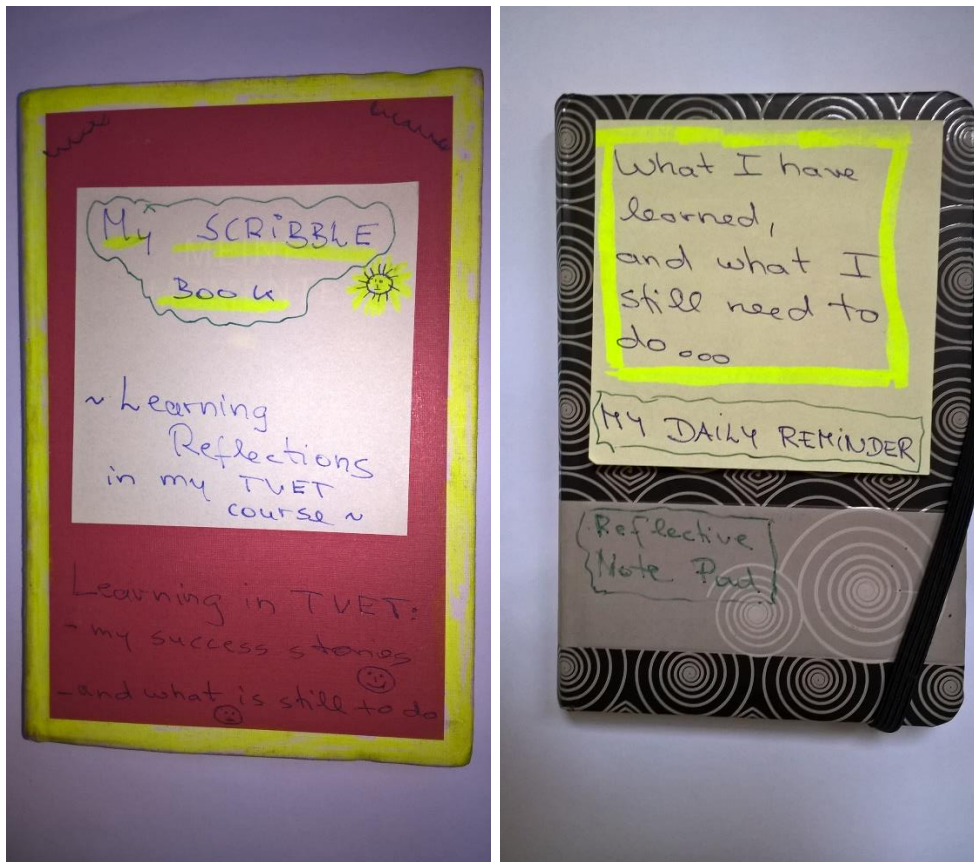


Figure 52: Potential reflection scribble note pads

In addition, it is worth looking at how a typical entry into reflective scribble note pads may look like. The example is taken from the scribble note pad of a trainee in the hair stylist trade:



Figure 53: Sample entry in scribble note pad

8.5.2 Selected significant assessment instrument No. 6: Reflective Learning Diary

Learning Diaries (or synonymously used: Learning Journals) are somewhat more formalized, but as all reflective instruments are individual expressions to a large degree, they still offer **some leeway when it comes to design**. Usually, the **overall form of the booklet is pre-arranged so that all learners in one batch use the same style of learning diary when it comes to the outer appearance**. Furthermore, the use of learning diaries is necessarily a planned component of any teaching session in TVET. Entries are made mandatory by teachers or even company supervisors, if training is appropriately coordinated between training institutes and training companies.

It is typical feature of learning diaries to have an **open and a closed section**. Students should be encouraged to use the **closed, and therefore private, section any time if they want to reflect upon their learning**, progress or experiences **without other persons' knowing**. These entries can by no means be looked into. That would infringe on learners' privacy rights but restricts the instrument's usefulness for assessment. The **open, and therefore public, section contains mandatory entries** and are regularly scanned by teachers. For the purpose of formative assessment, these entries must be scrutinized and feedback given individually. If proper criteria are negotiated—and they **must be negotiated** in Learning Diaries—, then this instrument can be employed for the purpose of summative assessment as an exception to the rule as well.

It is a requirement for learning diaries to look orderly, but there is **no need for an institution-wide design**. An ordinary diary book style will do:



Figure 54: Design example for a reflective learning diary

A task for a mandatory entry into a learning diary as asked for by teachers could look like the following instructions, exemplified by a task for trainees marked on a flip chart:

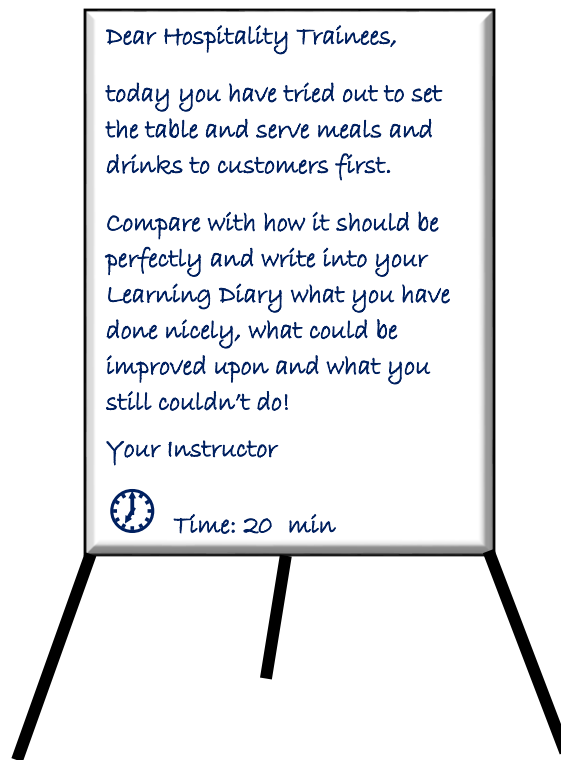


Figure 55: Sample task for an entry into a learning diary

Subsequently, all trainees come up with entries, trying to live up to what was asked from them, i. e. reflecting upon their learning experiences in a threefold way. Still, entries can be very individual. And as there is no request for a certain form, reflective solutions to this task can be anything in terms of a combination of text, drawings or signs. Modern digital and online learning diaries easily allow for pictures, videos being taken or voice recordings etc.

To visualize how a trainee's entry responding to the instructor's task on the flip-chart, it make sense to devise a potential entry:

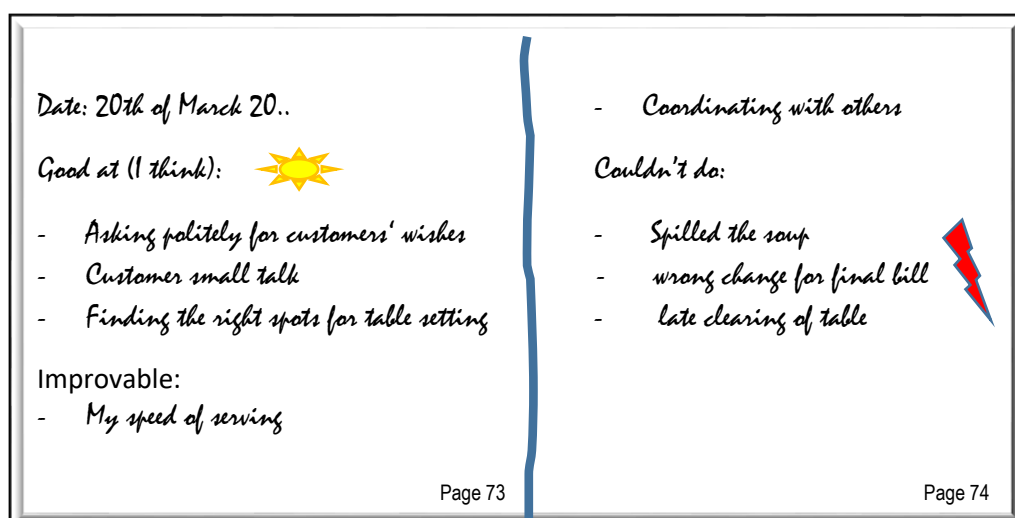


Figure 56: Potential entry in learning diary

Reflecting trainees often write in bullet points, but must take all instructions asked for into consideration, in a concise and meaningful way, as given in the example above.

The sample entry hints in all likelihood at a student highly trained with respect to reflection exercises, since the entry supports the appraisal by hand-drawn signs. It is essential that hand-writing is legible, as entries are part of the teaching process and have to be accessible to teachers' scrutiny.

The example provides a clue as to how simple it is to provide continuous feedback after such a reflective entry. That means teachers can match own observations with a trainee's self-appraisal. In the best of worlds, the two appraisals completely overlap—and teachers confirm a trainee's self-recognized needs and weaknesses. **Trainees can even come up with own plans how to target shortcomings by future learning processes.** Such an agreement can also be documented in the learning diary, taken down by the trainee, maybe signed by the teacher.

QTA Insight No. 65:

A reflective trainee can be easily **counseled by comparing self-appraisals with teachers' observations**, i. e. by formative assessments frequently carried out.

Final remarks on formative-only assessment instruments

The most advanced assessment instrument in terms of measuring reflective performance for continuous assessments is the **Learning Portfolio**. However, the learning portfolio can be utilized to conduct formative and summative assessments alike, the latter by agreeing on clear-cut criteria of portfolio keeping, types of entries that prove reflexivity and proper descriptions learning efforts as well as apt goal-setting and goal-achievement specifications. That is why the portfolio instrument has been discussed under the heading of multi-purpose assessment instruments above (see chapter 8.3.2). Nonetheless, it is the **supreme manifestation of written reflective learning instruments**, and may seamlessly be used as formative-only assessment option as well, if desirable.

What all these reflective instruments have in common is that they are **non-descriptive**. Merely descriptive entries are a major concern in learning diaries or similar reflective written instruments in use in TVET, as descriptions do not comply with the requirement of reflexivity of learning.

The upshot is it is nonsensical to simply report what has been done on the student's side. According to research, that has **very little effect on enhancing the learning outcome**. If written accounts of learning events are merely descriptive in nature, the resulting collection of documents is called a **Learning Report**, which can be meaningfully put to work mostly for documentation purposes.

The common imperative feature of enhanced learning by taking notes on a regular basis after learning events is reflexivity!

To be reflective means to muse about the learning process, own achievements and aspects that were a success or that could be improved on as well as intended work activities that could not yet be pulled off effectively at all. In the sequel of the process, there should be a further course of action outlined, especially when it comes to learning needs. Competencies acquired should be stated and proven by performance examples, strengths and weaknesses continuously thought over and confirmed or supplemented by third-party feedback, in particular by the teacher. In the end, there should be a collection or summary of achievements and the student has to argue convincingly to what degree skills have been routinized already. Competencies being claimed in a learning portfolio should always be supported by proof, and are subject to a teacher's investigation in the end and in a portfolio-related viva voce, for example.

QTA Key Insight No. 66:

All these written instruments must be reflective. **Being reflective means**

- musing about achievements and provide evidence
- contemplating problematic issues and provide plans how to redress them
- pondering remaining major shortcomings and thinking about potentials
- continuously working on issues and considering progress
- coming up with learning goals and revisiting them after learning sessions
- incorporating third-party feedback and comparing with self-assessment including consequences
- weighing achievements versus learning objectives and providing evidence for judgments at the end of the formal TVET course
- potentially discussing reflections orally in final viva voce.

Sometimes a fourth type of instrument, also referred to as a reflective method, is to be found in literature (cf. Boehner 2015), the aforementioned learning report. They do not really fit into the category of reflective instruments, but may be useful method of assessment all the same.

Learning reports are an altogether different beast. They are occasionally somewhat reflective as well, but are typically rather formalized in terms of how they should look like and what to cover in terms of learning experiences. **They are mainly descriptive in nature.** Mostly, the scope in number of pages and even a minimum and maximum number of characters are prescribed. Assessment criteria are generally provided by the teachers and the purpose of usage is mostly to lay the foundation for a final and summative assessment.

Learning reports bridge the gap between individual instruments of reflection and traditional testing in the continuum of assessment methods with regard to standardization and level of individual latitude.

Practical QTA Hint:

Written instruments of reflections can be beautifully combined with competence rubrics as a set of mutually supplementing instruments in an **assessment kit**, as rubrics may be used as a point of departure for self-appraisals in reflective instruments or for providing criteria as to what to peruse and reflect upon in detail. Moreover, learning objectives for moving up the categorical ladder in rubrics can be fleshed out in written reflective instruments. Also learning steps can be described and planned ahead. Eventually progress may also be addressed in these written instruments.

Put together, written instruments of reflections and competence rubrics constitute a very modern arsenal of assessment options, **perfectly living up to the demands of competence-based training and learning**.

8.6 Taboos in modern competence-based assessment

Finally, there are instruments that are **applied wrongly in TVET outright**, or that do not meet the stipulations of modern competence-based assessment. To ensure that this is not going to happen for any time longer, the following case study, on yet another instrument of assessment that is theoretically possible but unfortunate to have ever been used at all, shall be studied. The reason is that if the instrument is put to action inappropriately, this sort of assessment has the **potential to create lasting havoc among students**.

Case Study with respect to “NO-NO” assessment practices:

The case against traditional assessment methods of **oral questioning** in front of the group of learners:

“Morning 8.00 a. m. in some unnamed training institute:

The teaching session starts. The trainer has taken on the habit of repeating what has been covered last time around.

This trainer’s training sessions work like this:

First, some theory background is being covered by an illustrated talk, then moving on to a workshop and demonstrating a practical task, followed by students repeating the task themselves as best as they can. The following morning, the trainer starts the day in a classroom by calling up two different trainees to the whiteboard, asking questions regarding the theoretical input of the past lessons and letting them note down their answers on the whiteboard, in front of all peers.

This way, the trainer feels, frequent assessment and a grading of performance achievements on a daily basis takes place.

After this, the routine cycle of teaching starts anew.

Today, the trainer asks the cookery trainee Laksman to come up front.

Laksman starts to sweat, even though he didn't do badly last time around.

In theory classes, the module going on right now is about "preparing desserts". The trainer asks Laksman to write three popular desserts on the whiteboard and name all ingredients needed for them.

Laksman's heart is pounding, so much that he cannot think of any dessert at that very moment, even though he feels he knows at least a dozen. He is just standing there, stultified. Then, instinctively, he writes down "black pudding"—causing all other trainees to laugh, he blushes, deletes "black", but he is feeling like a fool, unable to name any ingredients...

The trainer is shaking the head disapprovingly, taking notes..., Laksman's trodding back to his seat, disgraced, harboring thoughts of dropping out. Becoming a real and good cook seems a distant promise to him at that moment!"

So what happened in this case study that needs to be avoided at all cost?

First, the trainer's routine **does not** represent **competence-based training**! Theory and practice is artificially separated. Instead, it should be combined, i. e. possible desserts and ingredients should be tapped by creating some desserts.

Second, the assessment method "oral questioning" means asking for mere facts and knowledge. As a results, there are no skills or abilities, no work-life situation or context of application needed. That is **not competence-based assessment**!

The trainer asks for isolated and potentially inert knowledge.

Third, negative emotions cause blackouts, forgetting and resentment towards the subject and the teacher. **Making someone look like a fool** in front of a learner's peers is a sure recipe for **causing negative emotions**.

Fourth, insecure young learners tend to be very nervous in front of a group when being asked to perform all of a sudden, possibly making them unable to retrieve their potential and recall essential input out of **nervousness**—in this case **no true assessment is feasible**.

And last but not least, starting each day with a routine type of reproducing isolated facts **prompts wrong learning incentives**, such as rewarding rote learning and short-term learning instead of reflective and long-term competence-based learning.

Instead, if "oral questioning" is used as an assessment method at all, questioning should be face-to-face, the questions asking for performance reflections instead of facts and the assessment must be based on proven skills and abilities needed at the workplace. When used this way, assessment via oral questioning moves can be applied as a formative assessment method as well, measuring learning progress along a process-based way. The method described in the case study is taboo!

Chapter 9: The Dawning of the age of high-quality center management

9.1 TVET institute's leaders of tomorrow

TVET institutes are mostly managed by **accomplished teachers**, or more troubling, by **external managers** that do not have any experience or deeper insight regarding the core processes in TVET, teaching and assessing. In rare cases, when the two types come together in one leader, this promising *mélange* is frequently spoilt by civil-servant minted hierarchical systems that are acquainted to command structures. In this case, the well-known comparison between managers and leaders applies:

- **Managers have subordinates**, and give instructions that are to be observed, but frequently just to a minimum degree, involving no own inspirational and creative input, i. e. never going beyond the instruction handed down on the side of the subordinates.
- **Leaders have followers**, and inspire by their visions and suggestions that staff members, i. e. followers, carry forward, adapt, enhance and turn into something very useful and continuously up for improvement.

As a matter of consequence, TVET institutes need leaders that are accustomed to and familiar with the toils and needs of everyday high-quality and hands-on training and that can create a vision, provide inspiration and treat human resources with respect, dignity, but also high expectations. By the way, a vision should not be out of touch with reality. Slogans like “We want to be the best TVET institute in South Asia” or “We aim to be the institute with the best reputation in the country” may be impossible to reach, depending on the point of departure. That is why **a vision should be aiming high but remain within reach** if all goes well and according to plan.

A good leader combines and evinces the following characteristics every day (Cochran 2014):

- Shows high level of **self-confidence**, but still asks others for advice
- Proves to be a good **communicator**, but even a better listener (Rule of thumb: A good leader listens two-thirds of the time!)
- Always acts as a **role model**!
- Oozes **inspiration**, motivation and vision, i. e. acts and talks in an **inspirational** way!
- Acts as a **TVET expert**, especially regarding core processes (teaching and assessing)
- Values and relies on **team structures**, i. e. is a **team player** that empowers staff and delegates management tasks
- is highly **organized** and a hundred percent **reliable**
- is in touch with all staff, i. e. **sociable** and **supportive** (e. g. predominantly by believing in coaching and counseling instead of reprimanding).

Figure 57: The characteristics of a good leader in TVET

Even though there is a saying that “good leaders are born”, there is a host of empirical and neuro-scientific evidence (cf. Davidson & Begley 2013) that training can bring about tremendous change and **turn capable teachers**, appointed as center managers, directors and principals, **into formidable leaders**. That must be the aspiration of any TVET system.

QTA Key Insight No. 67:

Thorough training of newly-appointed or aspiring and talented TVET managers, directors and principals can **turn them into excellent leaders!**

As a matter of course, good leaders need some generic competencies that enable them to lead, which are to be trained. International research in TVET has identified four main areas that comprise different abilities and skills for leaders in TVET leading up to comprehensive leadership competence (cf. Saha & Dworkin 2009 and Pilz 2017):

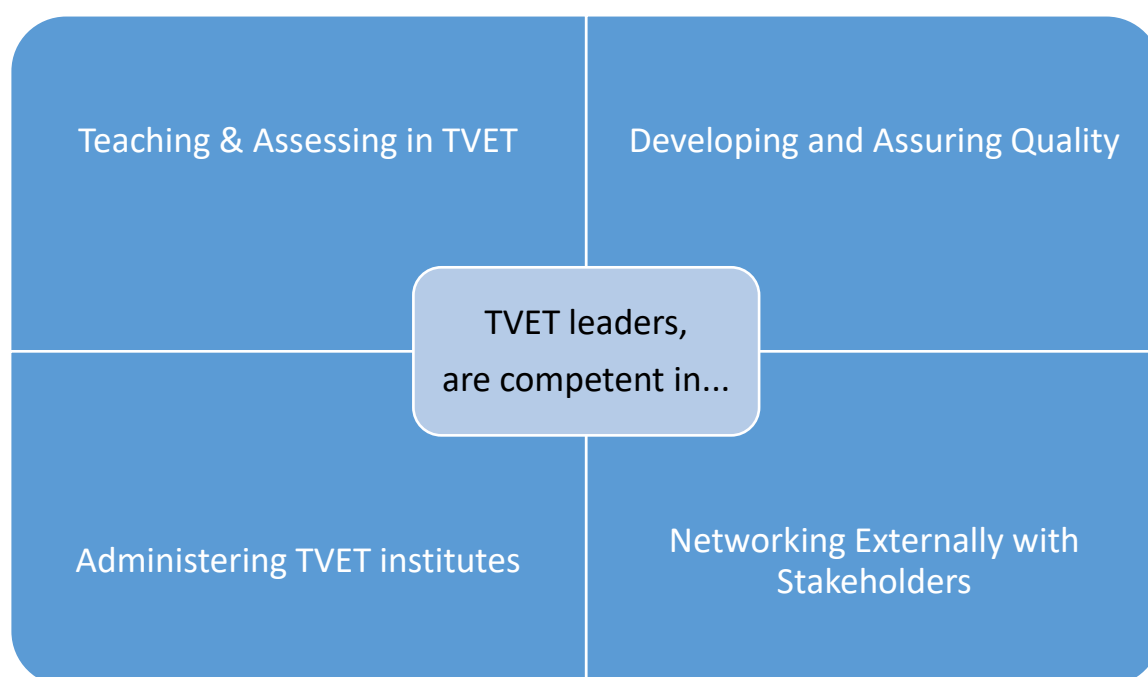


Figure 58: Areas of competence for TVET leaders

These four complex areas of TVET leaders' competencies are all important in their own right, but can be put to work only in the right circumstances: **high institute autonomy** and **financial resources** as well as **quality development** space for maneuvering. Consequently, depending on national regulatory circumstances and embeddedness in local structures of head offices, TVET leaders face quite different options of displaying their competencies in action. Nonetheless, they

should have some degree of competence in all four areas. The need to have a **management team structure to share responsibility** is sometimes neglected, as no individual can be expected to be a top performer in all four domains. But why is that so? Because the four competence areas comprise very different abilities and skills that are all pliable by training, but also very demanding and professional competencies that only develop up to a higher level after long periods of training and experience:

- (1) **Teaching and Assessing in TVET:** That comprises a very high-skill and complex arrangement of competencies that can best be acquired by own first-hand teaching experiences, teacher education and training as well as following the latest findings with respect to effective teaching, learning and training. Moreover, leaders must acquire the ability to observe and evaluate teaching in order to develop a “culture of contemporary training” in their institute and to counsel development of academic staff. Such a state is very difficult to attain for some external managers that do not come from the teaching field or the TVET sector.
- (2) **Developing and assuring Quality:** This area expects leaders to develop a realistic vision and a meaningful mission for the institute that unfolds into pertinent everyday behavior and actions of staff. Vision and mission are to be developed in conjunction with the entire staff, and should be a common undertaking. That means academic and non-academic staff rally behind quality goals that are designed to advance the common vision and implement the mission. Leaders create this sense of togetherness and install lasting and mutually benefitting team structures. Quality culture comes first, i. e. the striving of everybody to work in a highly professional environment that also caters to employees and customers as human beings. Along these lines, a quality management system is established that lays down the concerns and incorporates the expertise of all employees in institutional procedures and processes that everybody is happy with. In the end, it is the job of TVET leaders to foster such a quality and team culture, and to oversee internal cooperation as well as the continuous institutional and individual will to achieve goals, serve customers best and get better still.
- (3) **Administering TVET institutes:** In the area of administration, a TVET leader needs a very different set of competencies, e. g. organizational skills, goal-setting skills, operational and strategic plus visionary abilities as well as time management skills and an overview with regard to internal processes. The arguably most important competency in the administrative field is ICT competence, to implement a computer- and web-based management system, and to conduct e-leadership. On top of that, all important news and aspects are to be disseminated to all staff instantly, i. e. a leader needs to be able to communicate individually and with groups in person as well as via e-channels. Formal communication is of paramount

importance because that may prevent internal conflicts based on grapevines and gossip (cf. Nwogbaga, Nwankwo & Onwa 2015). Part of individual formal communication is the ability to carry out regular staff talks on results and development goals, as part of a wider capability to manage human resources. Next to recruiting and introducing new staff, the establishing and managing of effective teams belongs into that area as well. Of course, financial and marketing competencies are high stake-issues as well as administering an entire institute.

- (4) Networking Externally with Stakeholders:** Networking abilities start with having and developing a coherent public relations strategy and implementing in day-to-day operations to deal with potential future students, peer groups, school leavers, parents, individual companies, chambers, associations, maybe head offices, regulatory bodies and the line ministry as well as other TVET institutes, mainly with a local or regional focus. To deal with each of these different customer groups and stakeholders, a TVET leader plays a different role and may have to apply differing linguistic registers. Maintaining well-organized and stable external relationships, representing and advertising the institute in a professional manner, quasi as the face of the institute, and dealing with public bodies and industry representatives requires business-like manners and etiquette as well as very flexible communicative skills plus expert-level know-how of the TEVT sector. It also requires intimate details about the own institute. Moreover, intense team work with internal PR personnel is another prerequisite and leadership regarding the envisaged public image, also with respect to the message and poise of all staff.

In short, the following key competencies constitute the four areas of TVET leadership:

TVET Leadership Area:	Competencies:
Teaching & Assessing	Enhancing the standards of modern teaching and assessing in TVET Introducing innovations Supporting academic staff in their professional development
Developing & Assuring Quality	Implementing Quality Management System requirements and Quality Culture measures Generating new ideas and concepts to advance quality Engineering a sense of community and mutual responsibility

Administering	Organizing , esp. institutional processes and events as well as timetables Budgeting and economizing Communicating as superior, in face-to-face and larger group settings as well as in written style and e-style
Networking	Acting the role as TVET manager and dealing with other leaders Promoting and advertising the own institute Creating and maintaining professional networks

For the purpose of promoting the upgrowth of these key leadership competencies in TVET, a training program adapted to churning out capable TVET leaders should be in place. In the best of all worlds this is a fine-tuned Master's program especially designed for TVET leaders containing a practical application focus or a long-term training program arranged and implemented by some high-end further education institute in the TVET sector.

Below a few main features of such a training program are introduced and elaborated, to set an example what to include and to expect.

9.2 An inspirational two-day program for TVET leader enhancement

For inspiration, this textbook provides ideas by **proposing a two-day training program** that encompasses bits and pieces of an effective long-term program as well. Evidently, this is more a “sneak preview” rather than an in-depth qualification, but it provides clues of what a suitable training program should entail, taking all four competence areas of leaders into consideration.

Providing a prototype training program and setting an example:

A two-day TVET leader workshop—flaunting the main ideas!

The workshop follows the structure of a well-designed lesson and activates participants in different phases:

Motivational phase, self-regulated work phase, presentation phase and discussion phase as well as reflection phase.

Before the workshop actually takes place, moderators can send the **following self-analysis tool** via electronic means, to prepare participants for skills needed, open them up and sensitize them for competencies to be acquired:

Leadership SKILLS GAP SELF-ANALYSIS TOOL:

Assess yourself: <i>"I can ..."</i>	"very much so" (= expert leader)	"usually" (= able leader)	"partly so" (= novice leader)	"not really" (= skills that needs development)	Evidence / Reasons:
Leadership Skill 1: ...ask my staff for results					
Leadership Skill 2: ...coach and counsel staff					
Leadership Skill 3: ...cooperate with staff and management in a spirit of teamwork					
Leadership Skill 4: ...analyze sector-wide and self-generated customer feedback data					
Leadership Skill 5: ...suggest and negotiate quality activities internally					
Leadership Skill 6: ...communicate efficiently, as superior and team member					
Leadership Skill 7: ...change my perspective to see issues through the eyes of others					
Leadership Skill 8: ...promote and advertise my institute					
Leadership Skill 9: ...apply business manners and linguistic registers					
Leadership Skill 10: ...deal with other leaders from external partners					
Leadership Skill 11: ...create and maintain professional networks					

Assess yourself: <i>"I can..."</i>	"very much so" (=expert)	"usually" (=able)	"partly so" (=novice)	"not really" (=needs development)	Evidence / Reasons:
... achieve tasks and goals that require long-term and continuous effort as a leader					
... recognize external difficulties and setbacks and can develop solutions					
... accept critique concerning my leadership performance or behavior					
...see my weaknesses and overcome them by involving my staff					
...show patience and tolerance regarding staff's mistakes and problems					
...represent my standpoint convincingly					
...finish my work agenda in time					
...accept ideas of staff even if not in line with mine					
...name my own values					
...name my strengths and weaknesses promptly					
...relate tasks to my leadership skills					
I like to work on new challenges.					
I'm trying my very best even if I don't like the leadership task at hand					
I'm prepared to step back with own goals if my institute's goals require that					
I take good care of my leader's portfolio, daily notes have orderly records					

My REFLECTIVE SHEET for setting my

LEADERSHIP DEVELOPMENT GOALS:

...supporting my learning process as a leader and setting my objectives...



NOTES:

Space for sketches, drawings, mind or concept maps, illustrations etc.:

1. Introduction: Motivational Phase

In order to warm up to motivate for the demanding tasks and problems of leaders in the field of TVET, addressing a typical skill to be demonstrated by leaders provides fertile soil:

Leadership Skill 1: Asking for results

There are times when leaders have to request urgent measures from employees. That needs to be communicated. One way is to give an instruction is communicating the own objective:

“Please get this done by next week Monday 4 pm!”

Well, that is one way of doing it. After such a communicative act, that matter is not going to become the issue of the employee who will not see the necessity for the workplace nor her own life and work situation.

A second way is to explain why the measure is needed urgently, and then asking for support. This is an example how to do it:

“Representatives of our cooperating companies will come this Monday afternoon. They would like to hear how our students like their practical training, in particular in your field of expertise, the construction sector. As you are the most senior instructor and part of our quality team, could you screen our recent feedback forms and analyze the results? I know it is at short notice until Monday, 4 pm, for the meeting.”

But do you think you can do this for us?”

If the answer is **yes**, the employee being asked will have turned the leader's problem into an own concern, making the achievement highly likely.

The monologue given above exemplifies a leader's communication technique that must be practiced by role playing similar situations.

For that reason the following role play situation shall be performed during the workshop:

Role Play Situation:

“For next week Wednesday 10 a.m., a surprise visit by the head of the regulatory body has been announced, also looking into the records for last year's batches in all full-time courses. That has just been communicated by telephone. You, as the TVET institute's director, have no idea why—and you have not checked how complete the records are either lately. Unfortunately, you will be away on other duties until Tuesday, so you have to entrust the affair entirely to one of your colleagues.

The obvious pick may be your Quality Management Representative or your Registrar, as both are familiar with the topic, but they are also very much overburdened these days. So you think of one lecturer that is a very involved member of your quality steering committee and that has captivated your attention recently by impeccable individual records.

Ask the lecturer for a meeting to communicate the matter so that it will turn into the lecturer's own utmost concern. Use a proper communicative approach to do so!"

This introductory phase promoting participants' motivation lasts for about 45 to 60 minutes, bringing together teams of three doing the role plays (two role players and one observer). The observer provides feedback as regards how adroitly leaders communicate the task to the lecturer. Hence, the role play will take place three times, as the team alternates roles.

2. Main self-regulated work phase:

In the work phases of both days, major competencies of leaders are to be addressed that can be developed in self-regulated and exploratory work. From the competency table above, the following sub-competencies have been selected as standing out, worth of promoting explicitly during the workshop and early on:

Leadership Skill 2: Coaching and Counseling of Staff

Leadership Skill 3: Cooperating with Staff and Management

Leadership Skill 4: Analyzing Data

Leadership Skill 5: Suggesting and Negotiating Quality Measures

Leadership Skill 6: Communicating efficiently as Superior

The following **simulations** provide typical tasks and issues in TVET institutes that ask for consistent and immediate actions of leaders. These will be summoned up in group role plays incorporating different roles (e. g. Registrar, two local Quality Team Members, Quality Management Representative, Academic Coordinator or Academic Director, Training Officer etc.).

All of them are to be discussed and reflected. That means the workshop moderator is in charge of steering the processes of discussion and reflection after each simulated situation, following the study and scrutiny of the fairly authentic cases.

Simulation No. 1:

The leader of the TVET institute chairs a **Quality Steering Committee Meeting**, which is to be simulated. During the meeting, the following items on today's agenda are to be discussed:

Setting: 2 groups of 10 to 15 members each [Time frame: 180 minutes]

Agenda Point 1:

Critical Incident (see case study below):

“Communication procedure in division screened and a new one agreed on”

Case Study, elucidating Agenda Point No. 1:

A few days ago, one of the lecturers in the electrical division thought he had a great idea. He meant to bring a real-life problem into the classroom, i. e. the battery of a friend's car that was not working, the car wouldn't start. The lecturer identified the problem easily, but he wanted his trainees to analyze the battery and come up with a solution. That perfectly fits the competencies he tried to develop these days. This is how he wanted to start his training that day.

So he got to the workshop, just to find that his colleague had taken all students outside for a morning exercise the colleague had come up with. The colleague had talked to your head of division the day before, arguing that it might be a good thing to brief all students for the “open day” next month. He stated that the exercise would just take 30 to 45 minutes. Well, that was too much for the instructor's idea to start the day with, i. e. he stood with his battery in his workshop, all alone, somewhat upset. In this end, he communicated his misery to a member of your quality committee who put it on the agenda.

Can this be prevented, even without a strict procedure in place that kills all creativity?

Yes, what about a division agreement that if somebody, and the head of division in particular, does something that interferes directly with another teachers students, class, work hours etc.—or that even concerns the instructor in person—it has to be communicated instantly, e. g. via personal school e-mail, if that exists, or else a cell phone message. This way you would have known the evening before, and maybe the instructor would have brought his battery the following day. And better: the instructor wouldn't have been upset.

That definitely makes the instructor happier; and he wouldn't hold a grudge against his colleague. Well, and the colleague will realize that he somehow irked his fellow instructor! But he might not understand why—as a consequence the colleague may return these negative feelings in future!

That must be prevented by a suitable communication procedure!

- (a) Discuss the incident and come up with a refined approach of transparent internal decision-making and communication, resolving the problem.
- (b) Write the agreed-on procedure down as an entry into a **Quality Manual**.

Agenda Point 2:

Statistical Feedback on the course “Travel and Tour Management” from employers, after having participated in the institute’s yearly questionnaire-based survey

Statistical Report of employer’s feedback,

23 participating companies in the survey:

Excerpt:

The survey used a 5-point Likert scale, with the following indicators:

(1 = very well, 2 = well, 3 = acceptable, 4 = poor, 5 = unprepared)

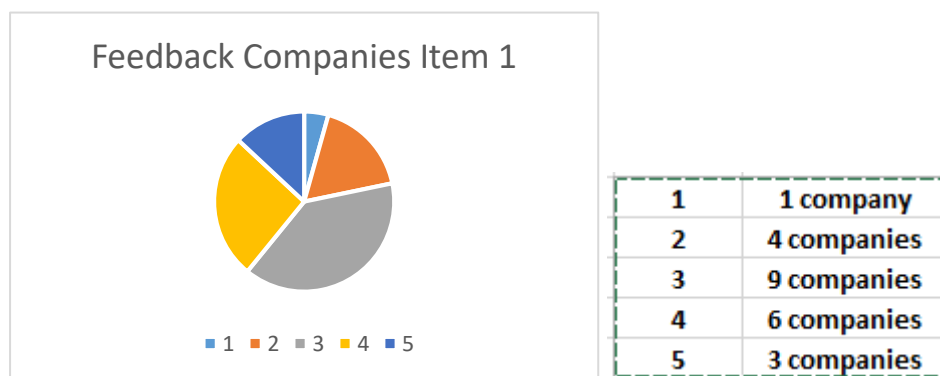
Item No. 1:

How well did our students come prepared for OJT in your company in terms of knowledge and skills?

Results:

Mean: 3.31

Distribution:

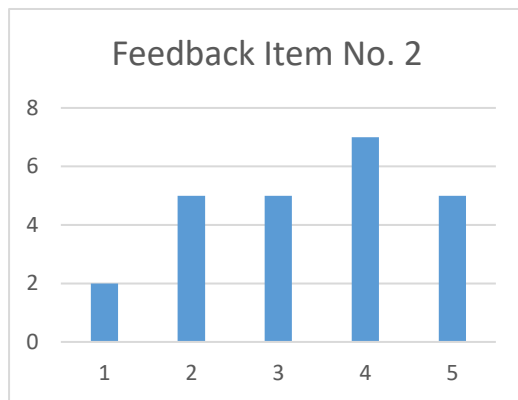


Item No. 2:

What is their level in job-relevant soft skills, in particular communicative skills, punctuality and conscientiousness as well as team skills?

Mean: 3.4

Distribution:



1	2
2	5
3	5
4	7
5	5

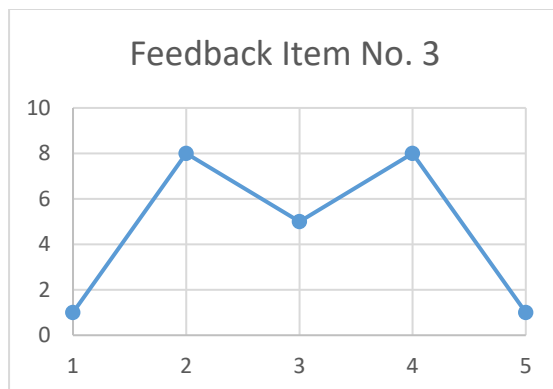
Item No. 3:

How would you describe the reputation of our training center?

(1 = very good, 2 = good, 3 = average, 4 = rather poor, 5 = bad)

Mean: 3.0

Distribution:



1	1
2	8
3	5
4	8
5	1

- Analyze the employer's feedback according to the survey presented above.
- Come up with potential reasons and an action plan to redress certain issues that you decide to rectify!
- Write your quality action plan down—also explain how much time you set aside for your actions and how you can systematically check progress!

Pragmatic QTA Hint:

Upon the wish of participants, a crash course of number-crunching statistical software (such as SPSS or MS Excel) can be offered for professional data analysis.

Simulation No. 2:

The TVET institute's leader chairs a **Management Review Meeting**, including all Heads of Divisions (HoDs), Vice-Principal, Registrar and other members of the local management team (e. g. Quality Management Representative (QMR), Principal's Management Assistant etc.). The issue at stake is the urge to streamline internal procedures. [Time frame: about 30 minutes]

At stake is the following entry into the institute's Quality Manual, which seems outdated as an internal procedure:

"The enrolment of students takes FORM A.4 (Parents' consent), FORM A.3 (Student's information and school record) as well as FORM C.1 (enrolment inquiry); the decision of enrolment will be transmitted to the student and the parents by sending out FORM C.4 (acceptance letter). All forms or copies thereof will be recorded in a student file, to be held in alphabetical order in the registrar's office (2nd floor, main building, office: 210, student files). ..."

You take a decision to digitize your enrolment process, even making it possible via your homepage!

- (a) Discuss the way how you are going to change your procedure with respect to student enrolment – produce **a graphic flow-chart as a team product** how the enrolment process should be treated in future!
- (b) Discuss how are you going to change your Quality Manual?
Reach consensus in your group and **come up with a new entry!**

Simulation No. 3: [Time frame: about 30 minutes]

The management team of the TVET institute has come up with the suggestion to change the internal policy of cooperation. An internal "contract" is envisaged to engage all employees and increase trust and delegation.

Therefore, the leader calls a staff meeting and chairs it, supported by the second leader in the command structure.

The rationale and goal behind the initiative are more effective and rewarding work processes for everybody, drawing on the findings of (1) quality culture, (2) positive psychology, (3) ownership and (4) empowerment.

During the staff discussion, these four key terms need to be clarified and exact passages to be agreed on, which shall be signed upon leaving the room by all staff. The following text components are suggested at the outset:

“We aim to empower staff to disagree respectfully with management decisions in meetings by giving own ideas and proposals, to utter their own mind, to act quickly and to recognize the achievement of colleagues by supporting them as well as to participate in quality task forces and long-term and ad-hoc teams.”

“We aim to counter resistance to change by encouraging a culture of quality.”

“We stand for an attitude of *‘Errors help us grow!’* and *‘We all learn something new again and again—we don’t need to be know-it-alls, we’ll learn together!’*.”

At the end of the staff meeting, all staff should be convinced and ready to sign the internal quality contract.

- (a) Discuss the contract in your simulated staff meeting, convince all staff and apply a participatory approach to leadership in the meeting!
- (b) After the simulated staff meeting, conduct a pro and contra discussion panel (Debate Method), weighing the potential impact of the contract and how to lead the institute in future, after having withdrawn from our roles!

Simulation No. 4: [Time frame: about 30 minutes]

There is a regular monthly meeting of your “**Leaders’ Best Practice Counseling Group**”, conducting a session of reciprocal consulting and sharing of leaders’ expertise. The structure is as follows:

A case provider describes a critical incident in TVET institute leadership (e. g. staff goal appraisal talk and a wide difference of self-assessment and leader assessment or private sector feedback of dissatisfaction with training at institute or personal problems between principal and vice principal etc.). Generally speaking, the critical incident relates to a difficult, and potentially unresolved, leadership situation such as dealing with “a difficult staff member (e. g. always coming late etc.)”, “trouble with parents”, “a management staff member that doesn’t accept or even counteracts a leadership decisions taken”.

The counseling groups consist of 8 people—never more, rather 6 or 7 leaders). It is important that the hierarchical level of the team member (e. g. institutes’ heads) matches.

Procedure: (One note-taker is required, jotting down bullet points.)

- critical incident is explained by provider of authentic case (5 min)
- first ideas on the case by other leaders uttered, one after another (10 min)
- two groups of three/four work out “professional solutions” (20 min)
- both groups present their two solutions (10 min)
- case provider may explain what she/he actually did (5 min)
- case provider gives feedback what she/he likes best (5 min)
- group members assure closed nature of counseling and finishes session (5 min)
- notes shall be provided to everybody by note-taker (best via email in retrospect)
- reflective leaders take a personal note in their “leadership portfolio” what they have learned and maybe consequences

The simulation ends with a plenary session that reports on **meta-level insights** (5 minutes), such as how useful the exchange in the **Leaders' Best Practice Counseling Group** was and whether leaders' competence can develop.

And, finally, the ability to address the issue of staff development and face-to-face talks is addressed in the final simulation for day 1.

Simulation No. 5: [Time frame: about 60 minutes]

All participants will gather in pairs, perform a role play of a face-to-face **staff development talk** and as a part of the role play sign a goal-statement laying out personal development options for the staff member.

The two participants prepare the role play by imaging a fictitious employee. They agree on typical features of the employee, no matter if academic or non-academic staff, and one participant takes on the role of that employee. The second participant of the pair plays the head of the institute that conducts yearly staff development talks and agrees on goals to reach for the next year for each employee, in particular personal competence development goals. Product goals can be agreed on as well, if both parties want that, but the focus of the conversation is to support and facilitate professional development of staff members.

As such a talk is a very delicate affair, both parties should prepare their meeting for at least 15 minutes, writing down phrases to use, aspects to point out as well as how and when evidence (observations on the leader's side) took place they refer to. Lastly, they may draft the agreement on development goals in handwriting from their own perspective.

After the role play, the pair withdraws deliberately from their roles and questions communicative strategies being used as well as results (e. g. the written agreement)—and how much both parties would potentially be satisfied with the talk. In the end, they write down what they have learned for their own staff talks.

Then they switch roles and go through the entire process once more!

Pragmatic QTA Hint:

Staff development talks and **agreements on professional development goals** should be a **regular tool** of a leader in TVET to conduct with every member of staff at least once year. That requires delicate phrasing and a positive communicative approach (i. e. praising performance and progress as well) during the talk, but also the statement of clear and observable goals in a written-style agreement!

In case the staff body is too large to make yearly talks pragmatic, at least so-called **special-occasion talks** (e. g. two months after first employment, for promotion candidates, upon application to some other position etc.) or **cause-driven talks** (e. g. after external complaints, internal strife, negative or positive observations etc.) should be conducted.

3. Presentation of results

The presentations are included in the structure of the simulations and happen after each simulation separately, by recording findings, ideas and lessons learned on flip chart paper, into leaders' portfolios or note-taking sheets—and are ultimately photographed or sent by e-mail and taken home.

At that point, the first day of training comes to an end, only to **reconvene for the second day** that is characterized by a new set of important leadership competencies, especially catering to skills **dealing with external parties and networking**.

Warm-up session for day 2:

The second day should not start with delving into another work phase immediately. Instead it makes sense to use the warm-up session to further competencies that are not addressed during the training otherwise, in particular in the field of administration.

For that reason, there will be two warm-up activities targeting two leadership skills in that domain:

- dealing with financial decisions and budgeting (Warm-up exercise No. 1)
- organizing work and processes (Warm-up exercise No. 2).

Warm-up activity No. 1:

Setting: Working alone, but sharing your decisions on a whiteboard/blackboard

“Your institute receives a windfall of 200,000 US \$ in international aid, totally unexpected. There is a snag attached, however. The donor expects a meaningful proposal about how to spend the money in your institute for the best benefit of your students. The second condition is that the money has to be used this year.”

Please come up with **a table** for which projects/purposes you would spend the money. There should also be a column with reasons, giving bullet point only!

Time frame: 15 minutes + 3 minutes presentation time allocated

Warm-up activity No. 2:**Setting: Work in pairs – present your solutions on a A3-format poster**

“For some reasons, many chairs have disappeared in the workshop room. As a matter of fact, there are only chairs left for a third of the participants. Please organize an arrangement that allows everybody to sit notwithstanding.”

Please come up with **an organization chart** or a **written plan** how to organize the new sitting arrangement!

Time frame: 15 minutes and 3 minutes presentation time allocated

4. Self-regulated work phase No. 2

For the purpose of empathetic and successful leadership, effective leaders must command the important abilities to “slip into another person’s skin”, create networks and properly deal with the wider world in general and external partners and stakeholders in particular. That is why several more skills are needed for a leader in TVET who represents the own institute in a way that contributes towards a high reputation and ultimately towards success in the training market:

Leadership Skill No. 7: Changing of Perspectives**Leadership Skill No. 8: Promoting and Advertising the own Institute****Leadership Skill No. 9: Applying Business Manners and Linguistic Registers****Leadership Skill No. 10: Dealing with other Leaders from External Partners****Leadership Skill No. 11: Creating and Maintaining Professional Networks:**

According to international research on different perspectives, human beings—in private and professionally—face major challenges in “slipping into the skin of someone else” and dealing with them appropriately, i. e. understanding a conversation and negotiation partner’s position, ambitions, objectives, (sometimes hidden) agendas and driving factors (Randell & Axtell 2016).

Again, research findings hint with high significance at the thesis that the problem of empathy and dealing with other human beings adequately is not necessarily a lack of the ability to empathize, which may be more or less developed in individuals, true, but is also accessible to improvements. Instead the reason may be that leaders are too absorbed by the machinery of their own organizations, goals and processes (Hacker & Sachse 2013) and by their demanding daily jobs. As a result, leaders find it hard to see through very different positions, as their day-to-day business is determined by their own or their institute’s ambitions and managerial ways.

There is a framework that covers these circumstances plausibly:

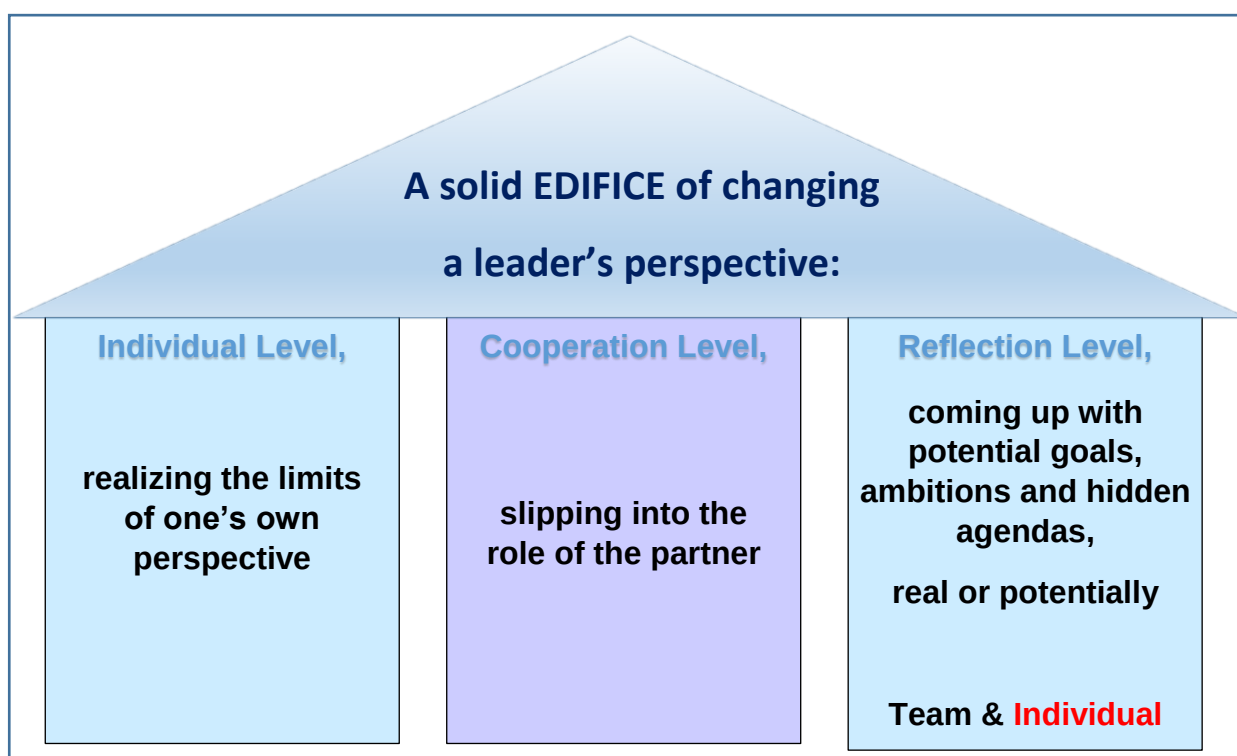


Figure 59: Framework for a change of perspective in leaders

To promote all leadership skills mentioned in the illustration, three training activities may fit into the second day of a two-day program, catering each to one of three levels of leader perspectives.

(A) Individual level of leaders' perspectives:

The idea behind this training aspect is to find out about limitations to one's own perspective and take others' picture into consideration before drawing conclusions:

The perspective game "Reality Check", worked out by the international training company *Metalog*, is to be introduced and played with all workshop participants.

With that game "Reality Check" leaders learn to share perceptions, rely on one another and see through different perspectives. Between 16 and 32 participants, in extreme cases, up to 64 participants, are possible.

Goal: The leaders realize the limits of their own perspective, working with partners to find out their perspectives and see how their own world view fits in.

Outcome: Leaders learn to see through the magnifying glass and the world from many different standpoints that are ultimately aligned and supplementary.

The game's unexpected final perspective and the individual's own learning effects are to be discussed in a plenary session, sitting in a circle, moderated by the

workshop leader. A written entry into a reflective sheet or even a leader's portfolio is highly advisable to write down individual insights.

Guiding reflective questions can be:

- “What was my experience about my own perspective,
- what are my limitations,
- what is it I have to be aware of?”

The exercise may be concluded by a short video that underlines the learning effects of the game. The video clip “ZOOM-IN” serves well to reinforce the perspective-changing mindset initiated by the activity above. As a side effect, the film provides a change of teaching method and supports the understanding of good teaching and learning, also an important leadership competency in TVET.

For access, see URL: https://www.youtube.com/watch?v=cMx8MrAH_NQ. (access 7th May 2017). Similar videos, starting from something really gigantic (e. g. the galaxy) and zooming in ever more into something really minuscule can be found aplenty on the web—and then live-streamed into the workshop.

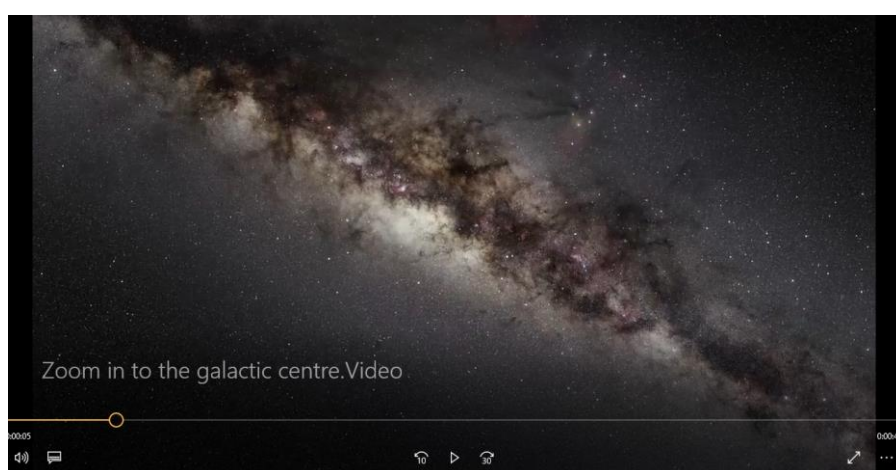


Figure 60: Video spot “zoom in”, visualizing changing perspectives

(B) Cooperation level of leaders' perspectives:

The idea of this training session is to see your partnerships through the lens of the private sector, in order to comprehend the agenda of partners and adapt the own strategy of negotiation accordingly:

Simulation No. 6:

This simulation creates the situation of a meeting, during which the TVET institute's leader is looking for a public-private partnership (PPP) that may finance a traineeship scheme in rural and poor areas, to be set up by a local institute.

TRAINING INSTITUTE PRINCIPAL:

“Lately, you have been in touch with your ministry, and they would love to see more cooperation between your institute and the private sector. With your management team and your quality team, you have worked out a proposal to set up a new satellite center in a rural area that should offer model traineeships, part-time in companies, part-time with the new center.

That is why you have been in touch with an international donor and have invited them as well as a large company in the region for a meeting, discussing the project. You hope to convince the representatives of the donor and the company to enter into a PPP and provide financial and staff support.”

TRAINING INSTITUTES MANAGEMENT ASSISTANT:

“You are going with your boss to an important meeting about setting up a satellite center in a rural area, establishing a new cooperation between industry and your institute. The training would be shared between the center and the company. That would be a large step ahead, in your eyes.

You know that for that goal to become a reality, your institute needs to convince the donor and the huge company present to finance the project and provide staff support as well—a daunting task, you find. But you are determined to give overwhelming arguments and lure the others into the projects, by pointing out mutual interests and goals as well as some social responsibility.”

DONOR PROJECT LEADER:

“As part of project, you are about to finance and organize the construction of new training center in a rural and poor area, urgently needed in that region to develop skills and to ready youth for the labor market.

However, you find that the money allocated will not suffice for construction, machinery, training of new staff and an advertising campaign—which you all deem very necessary.

A big industrial company, also operating a plant in that area, came your attention, as you obviously share a common interest. Today, you have agreed to a meeting with the CEO and Director Training of that company. You are optimistic that you can convince them to provide some funding as well to enter into a new cooperation agreement, as it is beneficial to all parties to train competent future employees.”

JUNIOR PROJECT EMPLOYEE:

“You are a local employee, and your project leader takes you to a meeting with a big industrial company that you have known since your childhood. Of course, you can bring in your mother tongue and cultural knowledge you share with the company’s representatives, even though they might belong to your country’s upper class.

You admire your project leader for her/his ambition and dedication to the project. That’s why you are determined to support her/him today in the negotiations to win the company over for some co-financing agreement.”

CEO OF COMPANY:

“You have been asked for a meeting with a big TVET institute and a donor organization. You have heard the names before, seen the logo of the institute, but you are not exactly aware of what they are doing, aside from technical training. You have agreed to the meeting, since you hope to gain some training expertise from them for your company, maybe even some training of staff for free from international experts. The agenda says that they want to talk about a new training center in a rural area. That doesn’t seem to concern you much, as you hire your staff centrally and send them to your plants. However, you do face some skill shortages. So far, you have been filling blue-collar positions with workers from abroad. That is cheaper and you don’t really want to spend more money on training, as that is an expensive thing already, providing in-house and on-the-job training for employees.

Unfortunately, you are a bit in a hurry today, as there are two more meetings today—and you need to get together with a minister tonight, to do some lobbying work that also needs to be prepared.”

DIRECTOR TRAINING OF THE COMPANY:

“You have spoken on the phone to the representatives of the donor organization and the training institute before the meeting, so you know that they want your support with a new training center in a rural area where you happen to have a plant as well.

A *quid-pro-quo* agreement could be of interest for you, i. e. to provide some on-the-job training opportunities for that new center in exchange for some further training provided by the donor company for selected staff, abroad or nationally by international experts.

Your training budget is tight so that you cannot provide trainers or even donations to the new training center. However, future graduates you might be willing to employ locally, if the training center proves to be of high quality. And, of course, your CEO could top up your budget.

You hope to have a nice meeting; and maybe the donor company even brings a nice gift from abroad for you, as they sometimes do (e. g. calendars, private planners etc.)!”

Rules of the simulation:

All training participants must take part in the ensuing role play. If there is an odd number of participants, you may cancel one participant, e. g. the local donor employee.

Role cards are handed out to teams of six. They must not know the background information of the other five role play actors.

- **Phase One:**

The preparation time is 10 to 15 minutes, including writing notes as prop for the meeting.

- **Phase Two:**

The actual time for playing the situation is set to vary between 20 and 30 minutes, depending on the action and liveliness of the role play. The time frame is within the discretion of the workshop moderator.

- **Phase Three:**

First, withdrawing from the roles is essential. Then all role players publish their own agenda, as given on the role cards. Subsequently, they discuss the value of the meeting's outcome for the different participants and switch mentally into the others' role. Nobody shall comment on the own role. (Time: about 20 minutes)

- **Phase Four:**

During that phase, a team reflection is asked for. The participants exchange their views via verbal comments on

(a) to what degree the participants could see through the agenda of the meeting partners, and

(b) if any viable partnership could take off after the meeting.

- **Phase Five:**

There should be a short plenary sharing session (Time: 10 minutes):

- All teams report how their role play went, how evident the partners' agenda were to them and if the outcome of the meeting is considered a success or failure, given the partners' initial agenda.
- The participants and groups should exchange their learning effects as to what might prove useful as leaders of TVET institutes.

The workshop conductor moderates that phase.

- **Phase Six:**

This level 2 training package for cooperative needs in leadership actions concludes with individual entries into a *Reflective Sheet* or a *Leaders' Portfolio* (Time: 5 minutes), guided by the following questions:

- What were my own experiences in the role play?
- To what extent could I see through the goals of my meeting partners?
- To what degree am I happy with my negotiation and persuasive skills?
- Why should and what can I improve in particular?

After the need for empathetic cooperation becomes clear, a general reflective attitude in negotiations and dealings with external people is the focus at level three of the edifice of changing a leader's perspectives (see figure 59 above).

(C) Reflection level for leadership regarding external relations and partnerships:

The training exercise elucidates hidden agendas, goals and problems in partnering up and networking.

Therefore, a case study is given that provides the opportunity to reflect upon such hidden agendas and goals of third parties. That may prevent major problems in cooperation and partnership as well as set realistic negotiation goals.

Case Study:

In the week ahead, there will a large-scale meeting on behalf of the ministry in charge of TVET, asked for by the Industry Sector Skills Councils (ISSCs) that are in charge of fostering cooperation between the private and the public sector. The World Bank, Canadian University Service, the Australian High Commission, US Aid and the German donor organization GIZ are invited to that meeting too, which also boasts the Chairs and Director Generals of the Chambers and Industry Associations of five very important sectors, i. e. Tourism, Light Engineering, Construction & Manufacturing, ICT and Agriculture, as well as several CEOs from each sector of the biggest companies in the country.

It is the official goal of this high-ranking meeting to bring together the public sector, the private sector and donors to initiate deeper cooperation for the good of the country. It is a first-time initiative of such as scale.

Accordingly, the setting is in a hotel and there are going to be a few introductory speeches, while the biggest chunk of the afternoon is set aside for discussions and negotiations in five different rooms, catering to the different sectors.

The leader of a TVET institute wants to make use of the occasion and find partners for

- (a) a co-financing partnership for establishing a new tourism course for poor youth in remote areas,
- (b) finding on-the-job training places for trainees in the engineering and IT field,
- (c) winning over financial, accounting and wholesale organizations to provide apprenticeship training places in cooperation agreements,
- (d) planning and opening up a competence center on campus in agricultural training as a PPP and
- (e) convincing industry to provide trainers as visiting lecturers in the health realm for a project to train urgently needed staff in elderly and kindergarten care on campus.

Finally, it would be nice for the institute's director to enter into a partnership with a private sector institution in future. But the details are not clear to the leader yet, i. e. the concrete goals are somewhat blurred and vague still.

Task:

Please discuss the following questions in TEAMS of 6 members and produce the output required:

- (1) Identify the objectives of the different players for coming to that large-scale event:**
 - (a) Ministry representatives,
 - (b) Industry Sector Skills Councils,
 - (c) Leading Figures of Chambers and Associations
 - (d) CEOs of MNCs or large national companies
 - (e) Donor Organization.
- (2) Identify the best partners to approach for the goals (a-e) of the institute's leader, and how to win their interest and to start a conversation!**
- (3) Prepare a list of arguments and a convincing fact sheet for the negotiation process, taking the partners' agendas into consideration!**
- (4) Find another group, team up and perform a role play with 6 partner conversations for the TVET institute's leader and representatives of the three sectors, two donors and one ISSC!**

Presentation of results of the new team of 12 members:

Get together and report your experiences in a circle setting as pictured below:



Discuss the following reflective questions:

- How was the process of negotiating?
- Was there any progress and follow-up plan?
- Did the conversation go according to plan, i. e. living up to the institute's goals?
- What was the concrete outcome?
- How can negotiating strategies be transferred to future partnership conversations?

Eventually, the exercise described above, promoting level three skills (reflection of perspectives), shall conclude by sitting in a plenary circle order and by verbally discussing two questions:

- (1) **“What were the CHERRIES picked, i. e. my personal ‘Eureka-Effect’, of the last simulated conversations on the basis of the case study?”**
- (2) **Entry into the *Reflective Sheet* or *Leader’s Portfolio*:
“What did I learn about the different vantage points taken by the various private sector participants—what did I learn from conversation mistakes / interaction best-practice?”**

5. Fifth phase: Discussion of insights gained

Finally, after a long day of training leadership skills, the entire group sits in a circle, and is asked to point out

**what they have learned about themselves,
what leadership skills were addressed and
what skills they need further training on.**

The results of the ensuing discussion should be recorded on flip chart paper—and digital photos taken, which are to be distributed. The participants may either get all photos at the end of the day on flash drives or on other mobile devices, perhaps as a gift and a starting point for the collection of further leadership training and ongoing contacts between the group members. Alternatively, the photos taken that day can be uploaded to a platform or emailed to the participants retrospectively.

6. Final phase: Reflection of individual lessons learned with respect to leadership skills

Even though this phase contains only a few lines in the description of the two-day training program for leaders in TVET, it explains the quintessential moment at the end of the intended development of competencies:

the participant-leaders' moment of mindfulness, calmness and introspection.

At least 20 minutes are to be set aside for this final exercise in a peaceful and comfy setting. The moderator selects some tactful meditation music to be played in the background to add to the **atmosphere of reflection**.

After having experienced several activities regarding skills and characteristics of great leaders, every participant is asked to take extensive notes in some reflective instrument. A **reflective sheet** would be good enough for this workshop. But in the end, it has to be emphasized that a great leader learns from experience and input as well as from colleagues and staff. **That is why a formidable leader keeps a leader's development portfolio.**

QTA Key Insight No. 68:

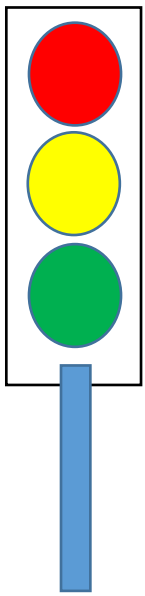
A great leader builds upon a reflected personality, i. e. **learns and benefits from experience and all people the leader works with as well as from formal leadership training**. Learning effects and leadership goals should be documented in a personal **leader's development portfolio**, alongside development goals and achievements as a leader!

Evidently, the person in charge of the workshop may ask for a personal feedback, anonymously in any case.

The two **following evaluation methods** are recommended for that, since they are carried out quickly and easily at the end of two intensive leadership training days. However, they still provide practically indicative feedback for workshop organizers and the moderator, and these methods are easy to analyze in terms of data collected as well.

Suggestion No. 1: Traffic light evaluation

This type evaluation is asked for on a hand-out for the participants that may look like this:

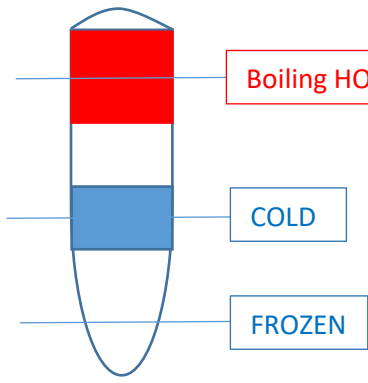


Please place a cross (x) into the “light” that represents the two-day training program best!

Also provide *three adjectives* that spring to your mind, describing the event (e. g. boring, inspiring, useless, new, lame, useful etc.):

Suggestion No. 2: Evaluation Thermometer

This method can be displayed on a flip chart poster or a white board, if the reasons are left out. That approach is meaningful if no time is left, i. e. participants can only place a mark in the thermometer upon leaving the room.



Please tick!

Boiling HOT

COLD

FROZEN

Reasons for your verdict, please name three:

(1) _____

(2) _____

(3) _____

After the evaluation, the participants are left to return to their institutes, but not before **long-term contacts and further training options** and responsibilities, via distance-learning contacts, e-learning platforms and leadership group meetings, **are established.**

9.3 Continuous education for leaders in TVET: a five-pillar long-term program

Typically, a program of continuous education for leaders in TVET should be a **follow-up measure to an intense program**, lasting for several days in a face-to-face setting, such as suggested in the previous section of this book.

Against the backdrop of an introductory leadership program, a long-term program can be initiated and bear fruits, not least because leaders have **established personal leadership peers to work with** and obtained insight into the various areas of competence that may evolve. Finally, they may have **started a leader's personal development portfolio** to continuously reflect on leadership training efforts and achievements as well as planned leadership behavior.

The following **five long-term leadership training measures** address all four areas of leadership competencies and build upon stepping stones and work procedures laid out during the two-day training program. A long-term leadership training program, consisting of five elements, is introduced as follows:

Element 1: Leadership Peer-Shadowing

Two leaders of TVET institutes are appointed leadership twins. It helps a great deal if they like one another. Therefore, to establish the relationship during the personal two-day program makes sense.

The concept is to visit the twin leader during an ordinary workday and accompany the twin during the day, without interfering or even commenting. The visitor is only an observer on that day, i. e. shadowing the fellow leader and taking extensive notes. As the procedure is known, this should not influence the leader being observed. For obvious reasons, that odd activity is to be announced publicly in the institute to all staff. In some exceptional cases, the observing leader may be excluded, but essentially the observer should experience the entire day, all contacts and actions, and difficult situations in particular.

At the end of the day, the twins should meet after work for about an hour. The observer reports his findings, inspirations, praise, hints, ideas and musings. The leader twin observed may comment, discuss, develop new ideas from the feedback and both may carry a thought to higher leadership ground.

In the end, both take a reflective entry into their leader's portfolio, jotting down new insights, confirmations and fields to explore as well as potential new leadership goals. The results are confidential and the observed twin returns the favor and visits the twin in her home institute, doing shadowing vice versa.

The *ultima ratio* for the exercise is to open the eyes for new ways and to reflect own routinized leadership that may be optimizable. Ideally, entirely new ideas are created and new leadership procedures established.

Peer-shadowing should be done once a year. After the second year, twins can change partners with another pair of leaders, to widen the spectrum once more.

Element 2: Regional Leaders' Online Community

During the personal two-day training program, TVET leaders that work in physical proximity establish regional leadership communities that share many issues of similar key stakeholders, customers and regional companies to interact with.

Moreover, regionally close leaders may meet in person as well without major obstacles of financially prohibitive costs, if they choose so. That can pave the way to continuous exchange and personal enrichment.

However, the main focus is on creating a regional leadership online community of 4 to 8 members, sharing leadership best practices and experiences, forms, ideas and hints on an e-platform such as Moodle, where the leaders have access and nobody else. During the face-to-face program, they sign a treaty of an online community that binds them to upload one best practice example at least once a month and also a form or tool that helps leadership or quality work.

In the end, as regional communalities are shared and best practices as well as forms and tools are shared, the online community creates a win-win situation for all leaders. The only aspect a national institution for TVET leadership can oversee is whether the regional online community members fulfil their duties committed to in the treaty.

No doubt, there is hope that such a regional leaders' online community goes way beyond the minimal duties taken on by its members, making it an exchange forum and establishing lasting leadership contacts and peer support.

Element 3: National TVET leadership Best Practice Portal

The national regulatory body installs an e-platform that subscribes to the intention of enhancing leadership in TVET. Therefore, all TVET leaders get access to that platform. And a regulatory requirement to head a TVET institute is to be part of the national community of TVET leaders.

The e-platform announces leadership training programs, provides material and forms as well as tools for TVET leaders and praises leadership achievements of individuals, if nominated by own staff.

There are leadership prizes to win (e. g. most innovative leader of the year, best leader of the year, most loved leader of the year and maybe a newcomer award). Criteria for these prizes can be proposed by the leaders' online community and are put to a vote.

But most importantly will be the membership requirement to post a leadership trick or a new leadership tool or improve on some existing trick or tool of another leader at least once a month. For active participation in the national TVET leader community, one may earn credits toward the title of the "best leader of the year".

Once every second year, there is a national leadership conference, analyzing the output of the online community activity of the two years and maybe produce a report and handbook of best practices.

The national community of TVET leaders has the potential to engage leaders long-term with regard to their development as leaders, foster personal contacts and establish a national competence center for leadership competence in TVET, institutionalized by a **division inside the regulatory body**. That division will not only oversee the community, but also organize the bi-annual conference and short-term programs (e. g. the two-day program outlined above).

The national online community of leaders serves as central aspect of cohesion in the consistently topical strive to enhance leadership skills in the wider TVET sector.

Element 4: Regional Leaders' Peer Counseling Team

This element of a long-term leadership training package directly draws on the experience from the workshop that leaders participated in personally (see last section), where the leaders peer counseling group was already practiced during day one of the program.

The variation is now that regional TVET leaders team up and meet once every third month in person. Ideally, two regional online communities of four members each come together and form the counseling group.

The issues to be solved in order to establish the counseling group are the redemption of travel costs and to be released from the own institute one afternoon every third month.

For the procedure, see the previous chapter 9.2, but the decisive factor of the approach is that alternating leaders give critical incidents in leadership, based on true experiences that are solved together and carried to a higher level through the synergy effects of combined leadership competence.

To be realistic, the personal meetings are scheduled only every third month. For that reason, two critical incidents can be discussed in one afternoon, to make full use of the occasion and to ensure every member brings in one critical incident once a year.

No doubt, the intention is to bring about close ties among the group members and foster interaction that goes further than the institutionalized counseling group. A best-case scenario may be frequent telephone calls or electronic communication, supporting one another and raising leadership competencies in the wake. But even if some contacts remain largely restricted to the meetings of the leaders peer counseling group, the interactions have their virtue and instigate internal reflections and evolving leadership skills.

Element 5: Coaching at the Place of Work

This element is about leadership coaching and should start on a positive note, i. e. not being used as a corrective tool when things have gone wrong in a TVET institute.

Ideally, the regulatory body of the country has a team of professional coaches that offer coaching service to advance leadership competencies free of charge and at the workplace.

The TVET leader identifies some skills and abilities that might need some professional development. Subsequently, the leader agrees on goals with the coach and becomes a coachee, to regularly converse on the day-to-day leadership experiences regarding that goal. It is quite useful if the coach visits the coachee at the TVET institute at least once to gather authentic workplace information and get to know the people the leader works with closely.

Afterwards, regular conversation can be scheduled via telephone or videoconference. This way a professional coach accompanies the development over a time span of at least a year. After that or even in between, new goals are agreed on or the coaching comes to an end.

Coaching can be taken up by leaders any time again. Private TVET institutes are advised to set some budget for coaching purposes of its leaders. If there is no standing team in some national body for public institutes, the line ministry in charge shall set aside some money for TVET leadership coaching to develop capable leaders.

Coaches are no psychotherapists or consultants but highly skilled professionals from the same sector with an additional coaching training (cf. Wayne 2016).

Any TVET leader should engage in coaching to hone own leadership competence once and again!

QTA Key Insight No. 69:

A long-term leadership training program that builds upon a two-day kick-off workshop **makes sense in any TVET system to continually enhance leadership skills, as leaders make or break successful TVET institutes.** TVET Leaders benefit from training effects to a large degree (cf. Pliz 2017).

However, leadership training-on-the-job cannot replace an initial and formal long-term educational scheme for potential and acting leaders in TVET, such as a hands-on master's program, combining theory and practice of great leaders. Therefore, this publication strongly supports such an educational option for future and current leaders in TVET.¹²

¹² A good example for such a program is a qualification such as "Master of Center Management" that relies on online learning and occasional workshops in person, providing everybody with the chance to follow the course, even if in a full-time position already, which might be the norm.

Pragmatic QTA Hint:

Any long-term training program for leaders in TVET may comprise all, a few or only one of the five training elements suggested. No matter how many, **any element of further leadership training is worth pursuing in TVET. Likewise, any combination of the five flexible elements is feasible**, at different locations, at variable timing and differing degree of e-support, depending on funding available.

Nonetheless, there should be national **public sector department consistently propelling leadership education and continuous training** as a major factor of successful and effective TVET institutes.

Chapter 10: Two transversal objectives in TVET: sustainability and peaceful interaction

10.1 Two overriding objectives in TVET

Many countries on earth have experienced rampant development or violent conflict, or both, in previous decades. While the latter may have destroyed lives and livelihoods as well as prevented development, the former has frequently destroyed nature, traditional ways of living and long-lived cultural traditions.

All of these effects are not in the best interest of any country—and to prevent such things to happen constitute preeminent targets. **Education** has always been a successful and powerful tool **to sustain culture and environment as well as to abstain from violent or harassing conflict**. In addition, **technical and vocational education addresses youth at a pivotal age** in becoming active and responsible members of society, and caters to a large percentage of each cohort of youngsters.

For that reason, **two transversal objectives in TVET** materialize that should be a **natural part of the curriculum** and integrated in teaching and learning sessions. These two objectives are:

- (1) **Sustainability** of environment, natural and cultural resources and beauty
- (2) **Peaceful interaction** of all human beings, i. e. all different ethnic, cultural, religious or linguistic groups—or even **reconciliation**, if conflict was prevalent in the past.

The two objectives being ignored are omnipresent observations in modern wasteful and multi-ethnic societies. Even if the objectives are not listed and specified in curricula, they should be **obligatory as cross-curricular issues to be addressed in TVET**, to ensure a livable future at all and a future for cooperation amongst a country's people and between countries.

For that purpose, **teaching and learning methodology** must be accommodating and in some cases **tailor-made to cater to these two objectives** in particular, at least occasionally, in TVET.

10.2 Integrating cross-curricular objectives on a daily basis in TVET

From the arguments given below, it has become clear that the aforementioned two overriding objectives must be promoted frequently alongside all hard and soft skills prescribed by the curriculum.

How can this be done without wasting time and teaching something entirely different, other than the focus of a course?

That is actually **not as difficult as it sounds**, since the high-flying objectives of sustainability and peaceful interaction many times **boil down to relatively easy questions**, to be introduced at the beginning of a teaching session, such as:

- a. Can the materials you have just used be recycled? How would you go about that?
- b. Can the input resources used be replaced by more environmentally friendly substances? How can that be made economically viable?
- c. How can more energy be saved during your work process?
- d. Have you acted in a tolerant way dealing with a person from another religious or ethnic background?
- e. Do you respect input from the other sex, or even another group of students?
- f. Are you open-minded regarding other ways of doing things? If yes, what have you learned that might be useful for you as well?

There are many more related questions that arise in the context of the two overriding goals, but the ones provided are a good point of departure for teachers.

If the **six questions are posed right at the start of a teaching session**, with the accompanying task to observe—best on observation sheets provided—the work process under the given emphasis (the six questions), then the **discussion and reflection phases on that particular day may exceptionally concentrate on one of the two overriding objectives**. This way, students may experience raised awareness and acquire abilities with regard to these two areas as well. The more technical focus of the course can be highlighted again following this.

Along these lines, **furthering the cause of sustainability and peaceful interaction can be part of the regular teaching process**—and may come to the fore time and again by posing the six guiding questions at the beginning of learning sessions, i. e. looking deeper into answers during discussion and reflection phases. For obvious reasons, students are **regularly asked to make entries into their reflective instrument** to deepen the learning effect.

Naturally, there are also a **few specific teaching methods** that promote awareness and competencies to go hand in hand with the two overriding objectives.

Mostly, they stem from **game-based or simulation-based teaching**, some rely on role plays or acting and others are downright discussion-oriented concerning theme-centered questions.

To provide a few examples, the game *Ecopolity* is a very effective method to awake sensitivity and spur skills needed **with regard to environmental protection and preservation**:

Vester, F. (2011): *Ecopolity*. The cybernetic strategy game.
Malik Management. DVD.

The game simulates interventions into the natural equilibrium, by implementing an easy pushing of buttons that simulate usage of resources, dumping of waste etc. The effects are sometimes truly surprising and invite discussion and reflection.

For the case of **tailor-made methods regarding peaceful interaction** with a larger community, we easy-to-implement methods that can be integrated into institutional syllabi as deemed fit are introduced below.

The following methods belong to the methodological type of **so-called “Trust Games”**. They are customized to **foster cooperation, understanding, an excellent classroom atmosphere**, but are also ready-made for reconciliation purposes:

Sample Micro-Methods fostering peaceful interaction:

- (1) Game **“PAIR INSTRUCTIONS”**: Student pairs stand as partners in a line, about one meter apart (e. g. Singhalese/Tamil tandems in Sri Lanka, Burmese/Rohingya in Myanmar or Germans/Turks in Germany), one partner stands behind the other and gives verbal instructions where to move, e. g. “go left, stop, turn right, tiptoe, jump over a line” etc. To combine that with language learning, the instructions can be given in a foreign language, e. g. in English, or in the partner’s mother tongue. To add some appeal to that game, the front partner’s eyes can be blindfolded.
- (2) Game **“FOLLOW ME”**: Again, the partners are arranged as in the game above. The front partner makes sudden and/or fancy movements, the partner following is bound to mimic the movements as best as possible.
- (3) Game **“FUNDAMENTAL TRUST”**: The game starts with the established arrangement. The person behind the “leader” closes her/his eyes, and touches the shoulders of the front person only with her/his hands, trying to follow the path while the front person “leads the way” through a randomly decided pathway, in a trustful and gentle manner.
A **stronger variation** in terms of trust is to stop at one point, the two partners turn around, the one with the eyes closed leans backwards, down to point to lose balance, trusting that the partner behind will hold her/him.
This variation is tricky and needs to involve an established culture of trust in the group already. Making fun with that exercise is truly inadequate! The teacher must hint at that fact before taking the game to that level.

**QTA Key Insight No. 70,
regarding the goals of sustainability and peaceful interaction:**

The two cross-curricular goals in TVET of paramount importance, namely to foster sustainability of life and work and peaceful interaction in a country and beyond borders, can be promoted with relative ease when

- (1) the teaching-learning process is sometimes focused on relevant guiding questions dealing with aspects of the two goals and
- (2) relevant and sensitizing games or micro-methods catering to these goals are inserted into the canon of teaching methodology in TVET.

Part C: Implementing QTA: How to Make Use of this Textbook

Chapter 11: A TVET teacher's resource of great avail

11.1 A general framework of adequate teacher training in TVET

In the 21st century, educational research has firmly established that **the teacher is single most influential factor in successful learning and competence acquisition** (cf. Hattie 2009 and Hattie & Yates 2013).

As the teacher and the teacher's actions count for so much in the learning process, it is **indispensable to invest in teacher training**, before they take up the task (pre-service) and continuously throughout their career (in-service). This book can serve as a source of inspiration for

- **In-service teachers** to adapt their teaching to up-to-date requirements
- **Pre-service teachers** throughout their educational process
- **TVET school management** and **TVET decision makers** to redesign their stipulations and ask their staff to perform to the latest findings in learning theory, educational psychology and competence research
- **Teacher Educators, Trainers of Trainers and Master Trainers** to modify their training and transform TVET.

Surveying effective teacher training in TVET seems to have produced a set a pillars upon which high-quality teacher education rests:

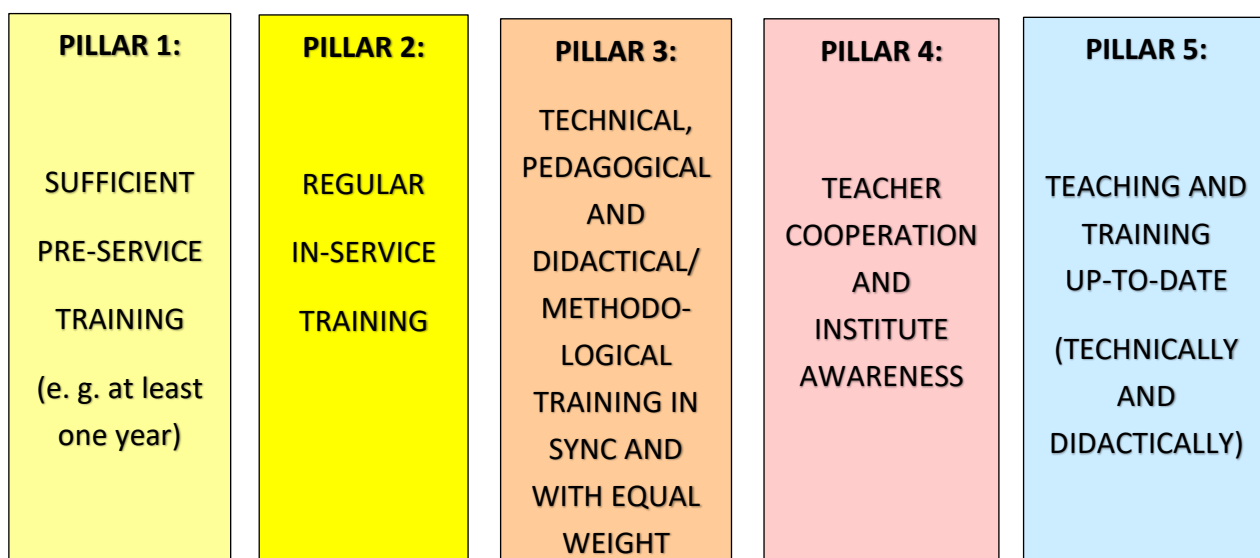


Figure 61: Five pillars of effective teacher training

For all of these five pillars this book provides ample points of reference:

- Pillar 1: First and foremost, chapter 1 can support the **understanding of competence-based teaching and learning as the basic concept** to grasp for any modern teacher engaged in TVET.

In addition, it is worth covering the five pedagogic principles in chapter 5 that underpin any teaching in TVET these days, discussing the relevance for practical planning and everyday teaching implications.

Not least, the chapters on **methodology and assessment** (chapters 6 and 8) may be browsed through. Adhering to the examples, ideas and recommendations provided, **pre-service teachers can be asked to design teaching sessions and assessment instruments** for real students and contact hours in TVET institutes, according to the guidelines provided.

- As regards Pillar 2, each demonstrator, instructor and lecturer should be released for several **workshops on updating methodological and assessment skills every year** (for example, see the one-day workshop suggested in chapter 12). It is essential to keep up with technical possibilities and new findings into how learning in TVET works best—that can be coupled with technical examples to make it relevant for everyday teaching.
- Pillar 3 highlights an important issue in TVET teacher education: Many times all course weight is being awarded to technical competencies while teaching abilities are not honed at all. That is a grave mistake, as **a good technician is by no means a good teacher**. There is an altogether different set of competencies to organize a classroom, counsel and assess students as well as cooperating with parents and companies. **Technical and teaching competencies should always be developed in coordination and mutual recognition** (see esp. chapter 3). TVET teacher training courses must be designed accordingly, i. e. by integrating teaching skills into technical modules such as simulating teaching of learned technical skills or acting out some teacher-student interaction in role plays.
- Pillar 4 is another neglected area of teacher education. Right from the outset, **teachers should be made team players** and asked to commonly develop training and lesson plans, exchange material and watch each other teaching (see e. g. chapter 6.2). On top of that, pre-service teachers should be made aware of the entire team of a TVET institute, e. g. by simulation all-staff meetings and deciding on the institute's way ahead or by projects that aim at improving quality of teaching and cooperating in an entire institute.
- Ultimately, Pillar 5 should also be looked into again and again. Well into the 21st century, there are still teachers engaging in “chalk-n-talk”, using blackboards, or whiteboards, instead of online tutorials. **Teaching technology is moving ahead quickly**, in line with changes in industry. So should TVET teachers! Each new generation growing up with ever more new technical gadgets expects that (see chapter 5.4).

Otherwise, teachers are considered hopelessly outdated by their own students. Of course, teachers need support to keep up with developments by regular **training sessions about new technological developments and methodological options** that go along with it, improving the art of how to teach well (didactical development).

11.2 Implementing specific aspects of modern teacher training

Being full aware of what initial and continuous teacher training in TVET should comprise overall, the **structure and content of actual teacher training events** becomes central stage.

There are **two major foci for any teacher training session** to be modeled on:

- (1) the regular **phases of TVET** teaching and learning practicals and lessons (chapter 3).
- (2) the **five basic principles** of teaching and learning in TVET (chapter 5).

And as a third non-negotiable component, thorough reflection of each learning event is to be institutionalized by introducing a **teacher's development portfolio**.

As a result, **teacher training sessions have to be models** for teaching and learning to be planned by teacher in institutes.

QTA Key Insight No. 71:

Teacher educator and trainer in TVET: "Practice as you preach", when it comes to teaching methodology used as well as to assessment!

That is also why teacher training sessions should also follow a clear-cut phase structure. As suggested in this textbook, these may well be the five (or six, if discussion and presentation are separated) phases identified. These phases can be arranged in a so called "loop-of-learning"-concept in any learning event, organized by teacher trainers and teachers alike (cf. Boehner 2016):

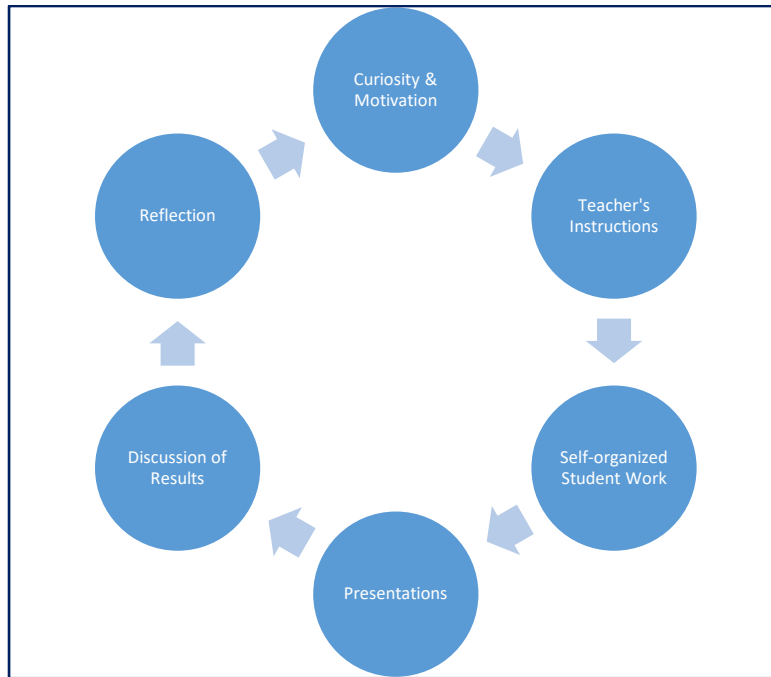


Figure 62: “Loop-of-Learning”-concept in TVET for phase-based structure of teaching

And as a second focus, activities should **comply with at least two out of five basic principles of learning in TVET**, whatever is being done at teacher training events. Teacher trainees need to **experience the “principles in action”** during their training, to be able to apply them themselves:

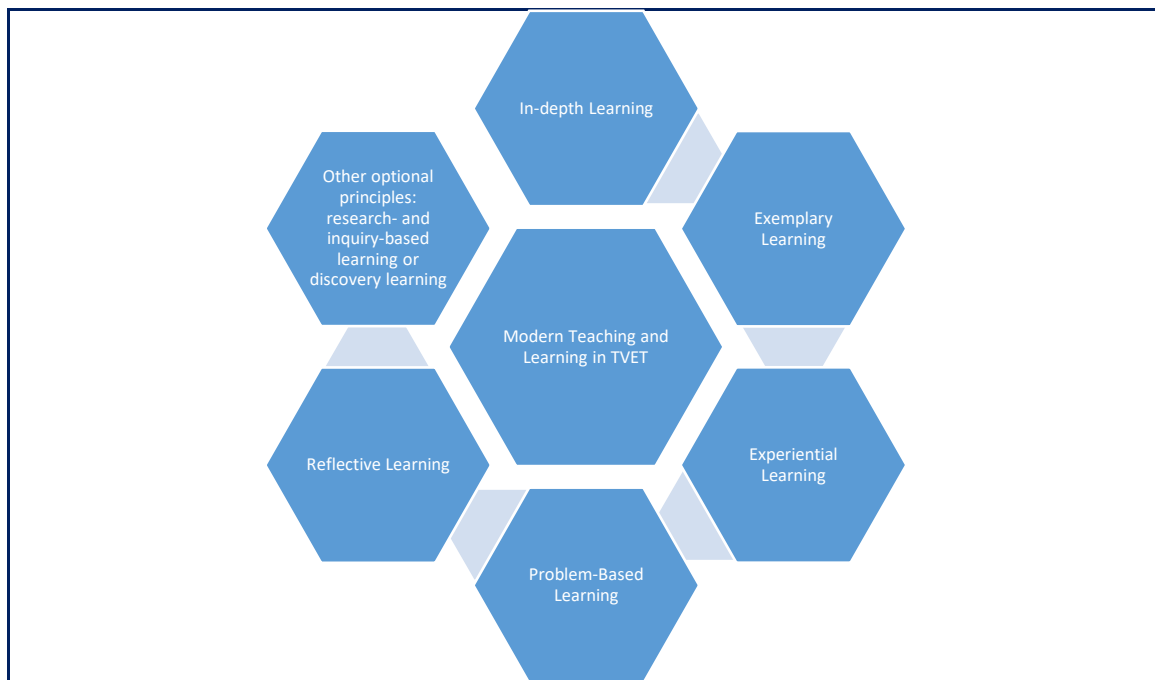


Figure 63: Basic principles of learning in TVET

Optional principles are mostly incorporated into the other five principles, since **experiential or problem-based learning requires some degree of self-regulated inquiry or even research**. However, to focus a few teacher training sessions on developing abilities to do responsible and fruitful inquiries or research projects is expedient as well, to lay the groundwork for the other five principles to be applied properly.

Further **defining features of all teacher training sessions** should be:

- (a) Work with a **sample form of training and lesson planning** provided in that book and ask students to follow the phase-based planning approach according to the “loop-of-learning” concept.
- (b) Have a go at teaching methods introduced in this textbook, and **ask teacher trainees to test new teaching and learning methods** as well, i. e. to incorporate them into teacher trainee's planning and reflecting results.
- (c) **Try out several assessment methods**, formative and summative, during teacher training. Then ask teacher trainees to test them in TVET institutes with real students as well, and again, reflect the results.

Ultimately, all these experiences have to be reflected thoroughly, instigated by swapping impressions with other teacher trainees verbally, but in the end by taking notes and formulation goals in the professional **teacher's development portfolio**. This reflective portfolio of professional teacher development should be kept throughout the career and accompany all stages of a teacher's professional life, if put to good use.

When teacher training is organized as suggested above, it will inherently be highly activating and train competencies teachers actually need with their students. It **follows the principle of experiential learning** throughout, as teacher trainees plan their teaching on authentic planning tools, try out methods and assessment instruments themselves and may use them henceforth.

QTA Key Insight No. 72,

on suitable teacher training in TVET in the 21st century:

Teacher training sessions must follow a **phase-based structure** (“loop-of-learning” concept), factor in the **five basic principles** of learning and let teacher trainees **experience up-to-date methodology, assessment and learning reflection** themselves. This is to make teacher trainees incorporate their own experiences into their planning and implementing of lessons, practicals and OJT.

Chapter 12:

A one-day training program on how to teach and assess well

True to the pedagogic principles underlying modern TVET established in this textbook, a training session on how to teach and assess up to highest standards is bound to rely on **self-exploratory and self-directed learning styles**.

Expressed in a metaphoric way: “See the world of learning through the eyes of your students and engage in self-experience!” is the mantra to follow, i. e. teachers in TVET study and get involved in training workshops in a fashion that they would like their students to act as well, setting an example and being a role model. For good measure, self-experience relies on the fact that such a way of learning achieves the highest and most effective learning results, lasting longest (cf. Kolb 2014).

As a matter of course, an effective teacher training session follows the prototypical pattern of an exemplary teaching and learning session in TVET. It is “quasi-dittoed” to routinize the established and effective phase-based structure, illustrated in the “loop of learning”-concept (see Figure 61 in the previous chapter):

- **Motivational phase**
- **Work instructions for teacher trainees by trainer**
- **Self-directed and team-oriented work phase**
- **Presentation of results**
- **Discussion amongst peers**
- **Reflection of individual learning effects and potentials.**

In addition, some of the methods expounded in this textbook are to be experienced first-hand during these six phases of training, along with the major task to come up with action plans to implement the five major pedagogic principles of learning in TVET, in heterogeneous groups that live up to the demands on effective groups (see chapter 6.2).

12.1 Motivational phase

12.1.1 Icebreaker method

As in such a training session the group of teachers comes together anew, it is essential to apply an icebreaker method for more fruit-bearing interaction early on. All the while, a highly **visual sign of welcome** should be in the background, providing some subliminal information already that will be central during the work instructions to follow by the workshop moderator.



Figure 64: Sign of welcome and agenda in the background

Icebreaker methods to start with are **used to ready strangers for teamwork and productive cooperation**. To provide an example, the following “icebreaker” activity can be asked for: “Introduce facts about your new partner, i. e. that person whose birthday is closed to yours!”

This way there will be plenty of interaction right at the outset to find that envisaged partner. Upon the partner teams being in place, the instruction for the icebreaker method proper are given, e. g. via multimedia slide.

Instructions for “icebreaker” activity:

“Sit face-to-face with your partner that you do not know yet, selected from our group today by chance, i. e. closest birthday. Find out the following facts about this person, take notes:

- Which institute does the person **come from** and what place is home (privately)?
- What is her/his **job title and position**?
- What does the person **like best** about her/his job?
- Find out **one crazy thing** the person did as a juvenile or youngster?
- Also, unearth one **surprising fact** about this person! (e. g. goes swimming every morning before, reads Chinese newspapers online, speaks Portuguese, likes to watch Star Trek movies, hates sports all of kind, likes gossiping etc.).

Sit back in a circle with the entire group (no tables please!), and report to everybody all facts about your partner!”

Well, this way the participants have experienced an activating style of getting to know one another and, hopefully, have create a pleasant atmosphere of work.

12.1.2 Creating curiosity

To make participants curious, as an initial motivational push, something unexpected or interesting is conducive. So there can be a short introductory video tutorial on “the teaching revolution ahead in TVET” and the concept of the “flipped classroom”, and creating even more curiosity as it is being recorded by the author of this textbook. The tutorial can be streamed or downloaded from the following URL:

<https://youtu.be/9KrJvizVasU>



Figure 65: Curiosity-arousing initial video tutorial

As a by-product of causing interest and creating curiosity, the five principles of good teaching and learning in TVET are already introduced. They should be uncovered during the tutorial, e. g. as a poster on a flip chart or pin board:

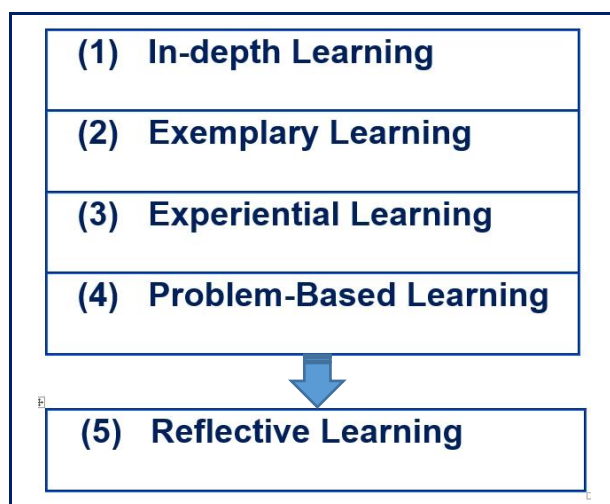


Figure 66: Poster of five principles of good teaching and learning to arouse interest

These five principles shall be the main focus to work with in this workshop, alongside exploring this textbook, introduced methods of teaching and assessment as well as recommendations. Following the tutorial, that is an opportune moment to invite questions and comments of the participants, before leading over to instructions for self-directed exploratory work, i. e. what to do with the information just provided.

12.2 Work instructions by moderator

The instructions how to move on should be clear and concise. The workshop should make use of the rules for effective group work, established in chapter 5 and 6, as well as effective workshop layout.

As any lasting instruction needs visual support, the work tasks can be given with the support of a presentation software slide, being projected by a multimedia device:

Work Instructions:

Please explore the textbook *'High Quality Teaching and Assessing (QTA) in TVET. Know how!'*
by dividing into 5 groups of 4 to 6 members:

Heterogeneous groups: i. e. different educational background, teaching different sectors, possibly different positions in institutes etc.

Differentiated topics:

- (1) In-depth Learning
- (2) Exemplary Learning
- (3) Experiential Learning
- (4) Problem-Based Learning
- (5) Reflective Learning

TASK 1: Design one practical or lesson according to the phase structure in Chapter 2 on a Planning form taken from Chapter 4, using suggested methods from Chapter 6! (60 minutes)

TASK 2: Design one continuous assessment instrument and one summative instrument, using the suggestions in Chapter 7 and 8! (60 minutes)

TASK 3: Design a typical ACTION PLAN that changes TEACHING & LEARNING in an institute toward the idea of the "Flipped Classroom" and your pedagogical principle (see topic) in TVET!
Provide at least 4 measures to be carried out to get there! (90 minutes)

Figure 67: Multimedia slide visualizing work instructions for workshop participants

The workshop moderator explains all instructions and tasks, asks if they are understood, supports the formation of heterogeneous groups, reminds them of the introduced rules for "efficient teamwork in the textbook (e. g. the moderator distributes different roles amongst team members), sets the location for teamwork and, in due course, assumes the role of a facilitator and counselor as well as pedagogical expert.

12.3 Self-regulated work by participants

Obviously, this phase must live up to the principles of good teaching and learning as well, exemplified in the five topics to be explored. The three tasks provided go into depth, as the groups explore **only one principle in detail** each. The work phase is exemplary, as the group members choose one occupation and one curriculum to come up with one lesson or practical. They experience planning themselves and face a real problem a part of task no. 3, i. e. how to transform the learning culture of an entire institute. Finally, the reflective learning part is placed to the end of this workshop. It is advisable to interrupt this phase for three small-scale presentations of the results of the three tasks. It would be best to have each group printing out their products, e. g. lesson plans, training plans, assessment instruments and action plans.

12.4 Presentation phase

This phase introduces a new method of presentation as well, the so-called **Exhibition Wall**. This method asks for everything suitable in a room to be used for the purpose of presenting, in particular pin boards, flip chart boards, bulletin boards and real walls to stick products right up to them. The reason is that everybody can walk around in the room, sight and screen products, ask questions from creators and discuss utility—even suggestions for improvement can be gathered.

The **presentation method exhibition wall** can be executed in two ways:

- a. Let the entire group of learners explore the products independently, take inspiration and talk about results freely.
- b. Assign at least one group member to the team product, and let products be explained to the other students right at the spot where they have been put up. The groups take turns, two might even explain products simultaneously, creating some **lively marketplace atmosphere**.

By the way, the method exhibition wall is closely related to **the Marketplace method**. The only difference is that “at a marketplace”, **teams market their product and present it in the best light**, because in the end, only one product will be “bought”, i. e. selected by the entire group of learners as the best.

The exhibition wall may only be used for the products of task 1, i. e. lesson and training plans. In fact, that is the recommended approach because this way two different methods can be experienced **by applying the marketplace method for presenting the results of tasks 2 and 3**.

As the workshop focuses on highly recommended and activating methods, the two following methods can also be used during the presentation phase, instead of the marketplace method (see chapter 6):

- (1) **Ball Bearing method (Double Circle)**: The individuals introduce their instruments of assessments to partners sitting face-to-face. A few changes of partners are recommended, but partners of the same group are to be avoided. Print-outs or digital versions of the instruments would be helpful to visualize the instruments.
- (2) **Fish Bowl method**: The five teams will discuss the strengths and weaknesses of their action plan, while the others observe this group discussing are standing in a semi-circle around them. The teams alternate the positions—the “hot chair” is always available for contributions from outside.

12.5 Discussion Phase

At the beginning of the discussion phase, the moderator, in coordination with the entire group, collects some sticky statements or points from different action plans. These aspects are to be visualized, at a white board for example.

Then, the group is separated into two bigger parties, one in favor, one against some of the statements and aspects. The two enlarged team obtain a few minutes to

prepare their line of reasoning and arguments. Then they argue and dispute in a **structured debate** (see Debate method in chapter 6). One respected participant is appointed the moderator. The preparation and the debate itself should last for about 30 minutes.

Finally, the original moderator prompts the participants to withdraw from their positions and poses the questions whether or not they could stand their own ground or were forced to embrace another view—and how difficult that was. On top of that, the final question should be:

“Have you learned something from the debate about how to implement changes in teaching and learning in your institute?”

That last question is already reflective in nature, but can be **reasonably discussed publicly by participants** that are apt and ready to do so.

12.6 Reflection phase

As this a one-off teaching session, there can be **neither a proper continuous assessment**, aside from ongoing counseling moments during the process at the workshop, **nor formative entry-taking** in long-term reflective instruments such as portfolios, journals, diaries or scribble note pads. But taking out an empty sheet of paper and **turning it into a reflective instrument**, the so-called reflective sheet, which may well be the start of an individual self-driven development portfolio, is **always feasible and advisable for the role models to be**, the teacher-participants.

So, at the end of this workshop, participants are asked to prepare a reflective sheet (see chapter 7) and **jot down important learning effects**, concentrating efforts on reflective guiding questions being posed:

Reflective Guiding Questions:

Please take out a sheet of paper, give it a heading called
“REFLECTIVE SHEET”!

Then, please sit quietly, think through the following questions and take notes
(10-15 minutes):

- (1) Do I understand the 5 principles of good teaching and learning?
What is most important for my professional life
- (2) Which teaching methods from the textbook have I experienced today?
Which ones am I going to try and use in future?
- (3) Which methods of assessment have I seen and discussed today?
What am I going to try and use in future?
- (4) Teaching and Assessing well in TVET, e. g. via the Flipped Classroom!
What does it mean to me now?
And how am I going to integrate the textbook's message into my teaching?

Thanks for today and may the work have given you a lot of inspiration!

Figure 68: Multimedia slide visualizing final reflective questions

For obvious reasons, it does make sense if each participant of the workshop can hold on to a copy of the textbook, to implement change, to remember aspects experienced and as a resource book. Ultimately, the hardcopy serves as an incentive for further developments and dissemination of ideas at home institutes.

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