

# QUALITY ASSURANCE OF VET DELIVERY TO QUALITY PROFESSIONALS

#### Liviu MOLDOVAN

"Petru Maior" University of Tîrgu Mureş, Romania liviu.moldovan@ing.upm.ro

## **ABSTRACT**

The purpose of the paper is to presents some results of the project entitled "Transfer of innovative training solutions for VET of quality professionals" (acronym TIT-us) financed by European Commission. It addresses to the need of designing new VET courses for training in quality management qualifications. Our approach for quality design of VET courses is to add the methodological step to the classic PDCA Deming cycle. We have shown that each activity in VET is a quality approach which consists of a number of decisions made within the five steps: plan, do, check, act and a certain methodology. The findings are demonstrated for each step, in actions the VET provider has to follow for an effective methodological process.

**Keywords**: vocational education and training, quality assurance, Deming cycle, PDCA, student response systems, mobile devices, activity based training

#### 1. Introduction

Global economic change has been the main driver of Vocational Education and Training (VET) Systems in the recent decades [13]. Vocational education reform constitutes a vibrant area of public policy and research [1].

Know-how, expertise and Quality Assurance (QA) associated with the new production technologies vary enormously throughout Europe when obtained on the job through the daily work [10].

Extension of new harmonised guidelines in combination with an educational framework targeting train-the-trainer, stimulate the cooperation and exchange of trainers between institutes, VET schools and industry [9].

Little information exists on VET quality, and the evaluation systems that do measure VET have not moved beyond compliance. Currently, VET evaluation systems are conducted separately and apart from other forms of evaluation generally used on community college campuses [3].

The Technical Working Group "Quality in Vocational Education and Training" of the European Commission has developed a Common Quality Assurance Framework (CQAF) for Vocational Education and Training (VET) aimed at supporting VET providers in the development, evaluation and improvement of Quality Assurance systems and practices throughout Europe [14].

#### 2. Consortium

The project *Transfer of innovative training solutions for VET of quality professionals* (TIT-us) [20] is promoted by Chamber of Commerce and Industry of Mures County Romania (CCIM) in partnership with HiST Kompetanse AS Trondheim Norway (HCR), Frøya videregående skole Sistranda Norway (FVGS) and Tiber Umbria Comett Education Programme Umbria, Italy (TUCEP).

The consortium has a strong industrial presence with strong ties to research within utilization of new pedagogical methodologies, and connections towards manufacturing industry leading to identification of inadequacies in existing training systems and international standards for effective train the trainer delivery.

The TIT-us consortium consists of a multidisciplinary team with a wide geographical reach and European footprint. The work plan involves a number of transfers of innovation and dissemination activities to be executed in Romania, Italy and Norway as well as to a number of meetings and conferences around Europe.

The European dimension of TIT-us is strong. Partners disseminate the project results through their membership in the European Distance and E-Learning Network [17] that includes most countries in Europe.

## 3. TIT-us aims

TIT-us links together three different countries qualifications systems and frameworks on the

support of QA related qualifications, functioning in practice as a translation device that is making these qualifications more readable, but also ensuring education quality. This helps learners and workers in this field wishing to move between countries, change jobs or move between educational institutions at home.

It provides a range of cognitive and practical skills for level 4 of European Qualifications Framework [15] that are required to generate solutions to specific problems in the field of Quality Assurance study.

TIT-us is attesting and recording of the learning achievement and learning outcomes of an individual engaged in a learning pathway leading to QA qualification, according to European Credit System in Vocational Education and Training ECVET [16].

TIT-us is aiming at disseminating and raising the awareness of a new integrated blended learning environment that offers flexible and pedagogical delivery of level specific mechanical industry production process training to VET schools and incompany training organizations in Romania, Italy and Norway. This includes:

- Educate VET QA instructors as Activity Based Training learning environment advisers
- Disseminate an innovative transfer system for SME in-company training, in three different European societies, that are delivered on a just-in-time basis.

TIT-us targets central educational needs by offering institutes, VET schools and industry itself access to flexible just-on-time on-the-job training activities that are independent of distance limitations. Furthermore, it targets teachers and QA instructors thus stimulating a life-long learning process through a dedicated train-the-trainer programme. This programme has a dual purpose by stimulating new teachers and instructors to apply technologies that enhance their professional reputation and their technological curiosity, as well as offering them an educational path for upgrading of their knowledge.

### 4. Quality design in TIT-us VET courses

European Organisation for Quality - EOQ [18] is acting as a worldwide leader in the development and management of quality in its widest sense, and as a key influencer in education in the field of quality in its broadest sense. The EOQ Harmonized Schemes are coordinated and recognized training and examination patterns at European level, in the quality management and other management topics.

In Romania, the National Authority for Qualifications ANC [19] has developed three occupational standards in the field of quality assurance, so VET providers may accredit courses for three occupations: Manager of Quality Systems, Specialist in Quality Systems, and Auditor in

Quality. Requirements of these standards are input elements for designing courses by VET providers.

The basic approach we have considered for designing VET courses is the classic Deming PDCA cycle augmented with description of methodology.

The quality assurance is a part of the daily VET activities and the daily VET activities cover a number of quality aspects. It is very difficult to allocate all VET activities and quality approaches to the relevant criteria, but the consequences of making a wrong decision are only limited.

Quality management methods, using PDCA cycle to conduct the teaching reform of advanced manufacturing technology has been reported by researchers [4], but also employment of PDCA cycle for deduction of a study model of specialized courses [2].

Our approach for quality design of VET courses is to add to the normal Deming cycle PDCA an additional step, the methodology. In fact, each activity in VET is a quality approach which ensures quality design of VET courses. It consists of a number of decisions made within the following five steps (Fig. 1):

- (PLAN) to elaborate a purpose and a plan;
- (DO) to implement the plan;
- (CHECK) to assess and evaluate activities from the implementation step;
- (ACT) to collect feedback and transmit to procedure for change;
- to follow a certain methodology.

The characterization of the five steps and particularization in the TIT-us project, is presented below.

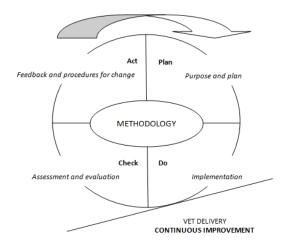


Fig. 1: Quality circle in VET

Step 1: (PLAN) Purpose and plan – characterised by clear purpose and consistent planning addressed to achieve the set aims. It consists in establishing objectives and processes required to deliver the desired results. In the VET schools there are a number of processes that are interrelated. As an example: the administrative

routines for creating/starting new courses, improvement of existing curricula, the administrative routines for the trainees, maintenance and purchase of equipment, etc.

In order to have an effective planning process, there are some actions the VET provider has to solve: to establish the goals/objectives of the organisation in relation to VET; to provide goals/objectives clear and measurable; to include in the goals of the organisation the European VET objectives; provide goals and to measurement/assessment method for the degree on which the organisation/system fulfil goals/objectives; to have a procedure for the planning process within the quality approach in use.

In the Tit-us project planning consist in: the European and national goals or purposes for VET are known throughout society in each partner country; we have systematic procedures to identify future needs of participants in training; we have a number of minimum objectives/standards established in the project proposal; the goals are communicated to the partners/project members; results on specific indicators fixed in the project contract are systematically collected.

Step 2: (DO) Implementation - characterised by existence of an implementation plan; allocation of resources and clear responsibility. It consists in implementation of the process developed. This means that a number of processes must be implemented. Each process must have an owner/responsible entity that are clearly defined. The implementation requires that the organizational structure is clearly defined with responsibilities and authorities to carry out the actions that are needed.

In order to have an effective implementation process, there are some actions the VET provider has to solve: to establish how to implement a planned action; to describe the key principles in the procedure of the implementation process.

In the Tit-us project implementation consist in: legislation demands a quality approach at provider level; contribution of the social partners; work of the VET providers; giving the full responsibility for implementation to VET-providers; setting up a number of minimum criteria the providers have to meet; given a specific quality approach to be used by all providers; by organizing and by allocating funds to: Partnership, Leadership, **Process** management, Training of trainers, Didactical material, demand for transparency and coherence with goals; involving different stakeholders in the work; ensuring good working conditions and facilities throughout the organisation.

Step 3: (CHECK) Assessment and evaluation - characterised by existence of a well-described assessment system and a systematic evaluation strategy, but also for use of a consistent and accountable methodology for both assessment and evaluation. Monitor and evaluate the implemented

process by testing the results against the predetermined objectives. The processes and objectives can be monitored in a quantitative way. It also consequently means that the objectives must be clearly defined so they can be monitored. Objectives of a general nature cannot be used.

In order to have an effective assessment process, there are some actions the VET provider has to solve: to describe the procedure for assessing - the input, the processes, the output, the outcome results; to ensure that the assessment and evaluation process is relevant and systematic; to nominate stakeholders that participates in the assessment and evaluation process; to define roles the stakeholders play; to establish the assessment and evaluation frequency.

In the Tit-us project assessment and evaluation consist in: the process of assessing is using: selfevaluation; external inspection; internal quality control; the actual results compared to the expected results; results of teaching and learning; stafforiented results; key performance results; societal results; the systematic feedback is collected by asking the users; stakeholders participating in assessment are: managers, teachers, students, parents and the employers of the students; the stakeholders participate in a broad range of activities e.g.: initiatives, decisions, evaluation, certification, the link to the labour market; assessment is performed: after completing education, during the period when the students attend school.

Step 4: (ACT) Feedback and procedures for change - characterised by visible and documented connection between feedback mechanisms and planning process. Apply necessary actions for improvement if the results require changes.

In order to have an effective acting process, there are some actions the VET provider has to solve: to organise feedback and procedures for change in the organisation/system; to ensure systematic feedback; to make transparent the feedback on quality in VET; to ensure that the results of the assessment/evaluation are used; to relate the goals/objectives to the assessment and evaluation.

In the Tit-us project feedback and procedures for change consist in: feedback and the procedures for change are an integral part of the provider's own learning organization; each department has to report to management in accordance with a fixed plan; the results of the assessments are used by a combination of control and development meetings with the different departments and by the participation of many different stakeholders in the work; relation between goals/objectives to the assessment and evaluation are established at meetings in of the VET provider as a systematic part of the decision-making structure.

Step 5: Methodology - characterised by description of methodology.

In order to have an effective methodological process, there are some actions the VET provider has to solve: to establish the way of employing the quality approach; to nominate stakeholders that is involved in the different steps of the quality approach and in which roles; to establish tools and procedures to be used for data collection, measurement, analysis, conclusions and implementation; to check the tools for accountability and consistency; to motivate participants to play their roles properly; to define strategies for the implementation of change; to use external assessment in a proper way.

In the Tit-us project methodology consist in: we have decided to use quality approach based on the ISO standard quality system; a number of different actors - from social partners, to students - are involved; external consultants participate in some parts of the activities; we develop common questionnaires, instruments for measuring quality, benchmarking, etc. together with a selected group of other VET-providers; the external participants are motivated by their influence over the VET providers, as board members. Internally, the main motivation is personal development, but also consideration for the image/results of the institution; the systematic structure of our quality system includes clear strategies for change; audit is following our plans.

# 5. Implementation strategy

Based on user requirements specifications, the implementation strategy for the stakeholder groups (QA personnel) consist in:

- 1) Format of courses, that are used by instructors during courses delivery: Quality Auditing in manufacturing; Quality Management in manufacturing; Quality Assurance in manufacturing, in the consortium partners languages;
- 2) Pedagogical methodologies, Student Response Systems (SRS) technology and Activity Based Training (ABT) learning environment, that are used by instructors during training.

In the TIT-us project the innovative educational tools imported from Norway are ABT and SRS, that are adapted in this project to the specific context of education in quality assurance in each of the three participating countries. The ABT methodology is used for QA courses in VET, according to ISO 9001. Evaluation of theoretical achievements is done with SRS [6].

Use of innovative response technology SRS - Student Response System on modern mobile devices engage, motivate and increases communication and collaboration in classes [5]. Such technology is used in Norway, only at Trondheim University [2, 11]. The teacher gives the students a task. After solving the task students respond anonymously by using the mobile devices like ipods. It provides new pedagogical methods that

enhance communication and collaboration, and interactive teaching models [8].

The new ABT methodology has been exclusively developed in order to facilitate and strengthen industrial production process training in VET schools and in-company training. Theoretical training are always followed by practical training in such a way that VET instructors may integrate industrial quality management and quality assurance designs that are directly related to the quality in the production process [7]. The new learning environment may at European scale be used in education of more than 50.000 mechanical industry workers per year, and in fabrications companies that need to certify and re-certify more than 2.500 000 production process personnel during a period of two years [20].

The methodology is based on industrial case studies and examples covering a variety of industrial sectors covered by EU regulations and directives. This will ensure a cross industry interest in the project as well as secure exchange of information between the different sectors. By using the EU directives as reference, the project relevance for the industry will be imminent. Reference examples of good practice will be highlighted throughout the project.

The new learning environment promotes modernization of the educational system since instructors and students optimize the cost-efficiency and QA effective solutions in production process by evaluating different training paths that improve quality and reduce costs, thus avoiding an increase in the total product and life-cycle costs. This is important in a time period where the financial situation is challenging for the manufacturing industry across Europe. The methodology may handle important task as: a) to learn to select the proper technical parameters which may influence vital cost parameters of the production, b) to visualize the consequences of selecting different production parameters, such that the training improves the quality of their own work by pointing explicitly out which parameters it is critical to fix, and which parameters that are flexible, and c) engage the students to observe how important it is to select the proper production technology, by simulating and displaying the cost efficiency in the production process;

3) Training of instructors delivering courses - the objective is delivering a set of state-of-the-art training courses for instructors and teachers. This activity acknowledges that the key person to motivate the students is the teacher itself. This activity will create guidelines and examples on how to implement the new pedagogical training principles in education, and organize it in a "good circle". These courses are of generic nature and have a cope of use far beyond vocational training itself.

The following courses are foreseen:

- SRS technology support for interaction in vocational education,
- ABT learning environment development of practical skills.

The goal of the courses is to give the participants basic understandings on how to plan, deliver and perform vocational educational programs that explore ABT and SRS. The training consists of a combination of theoretical and practical tasks in class (2-3 days), and that it may be followed up by mentoring and guidance of the instructors/teacher.

### 6. Discussion and conclusions

Chamber of Commerce and Industry of Mures County Romania is coordinator of the project "Transfer of innovative training solutions for VET of quality professionals" (acronym TIT-us), financed by European Commission.

TIT-us is aiming at disseminating and raising the awareness of a new integrated blended learning environment to VET schools and in-company training organizations in Romania, Italy and Norway.

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For each step we have shown the actions the VET provider has to solve in order to have an effective methodological process, but also what is the content of each step in the Tit-us project.

The quality design elements presented in this paper are used for the VET courses design, in continuation of the project.

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