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Quality and Standards in Learning, Education, and Training: The Adaptation Model IDEA for the Introduction of Quality Development

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Abstract: This article focuses on quality development in Learning, Education, and Training (LET) and on quality standards as appropriate instruments for corresponding activities. Quality standards are supporting the adoption and implementation of quality development throughout the whole organisation. Based on the introduced definition of quality development, the benefits of quality standards are presented. Especially the first ISO quality standard for learning, education, and training "RFDQ" (ISO/IEC 19796-1) offers a promising potential for the raise of quality awareness and the involvement of all stakeholders. The presented adaptation model IDEA for the implementation of the quality standard is the main focus looking at the specific given situation and organisation.

Introduction

This article deals with the tasks and potentials of the quality development and looks for appropriate instruments. The answer on the question: "How to implement and improve quality development in Learning, Education, and Training?" leads to the support which can be provided by quality standards. Based on the general definition of quality development, we will introduce quality standards as an appropriate means for quality development. The first ISO quality standard for learning, education, and training "RFDQ" (ISO/IEC 19796-1) will be explained and the adaptation model IDEA will be introduced. In summary, the implementation and adaptation of the quality standard demonstrate its support for the quality development in learning, education, and training.

1. Quality Development in Learning, Education, and Training

Quality development is a crucial task for learning, education and training (LET). A long-term debate on quality development regarding the different quality issues, aspects and approaches has taken place (cf. Deming 1982; Juran 1951 and 1992; and for an overview Stracke 2006a). This article focuses on the special support that quality standards can provide and in this regard, we can only highlight the main characteristics of quality development and its relevance in e-Learning.
Quality development in its broad sense can be defined as follows (cf. Stracke 2006b):

> **Quality development** covers every kind of strategy, analysis, design, realisation, evaluation, and continuous improvement of the quality within given systems.

Quality development needs a long process to be established and integrated throughout a whole organisation. Once started, it has to be a continuous ongoing circle to be successful. Quality cannot be described and fixed by a simple definition, because in itself quality is too abstract to have any impact. Therefore, quality has to be defined and specified according to the given context and situation considering the perspectives of stakeholders involved. It is important to identify the relevant aspects and to specify the suitable criteria. It is necessary to find a consensus amongst the different views and perspectives to gain a common understanding of quality for the given context and situation due to different and sometimes contradictory needs and definitions of quality by all stakeholders (Crosby 1980; Deming 1986; Donabedian 1980).

In this way quality awareness is the basic requirement for the adoption of quality development by all stakeholders from any organisation. But quality awareness will also be raised by the implementation of quality development on the other hand. To come to a sustainable integration of quality development within the whole organisation and to ensure the involvement of all stakeholders it is crucial to build a quality strategy and to integrate the quality objectives into the educational and business processes. Also the stakeholders' needs and responsibilities need to be integrated into the overall quality development. The process of the adoption, implementation and adaptation of quality development can roughly be divided into three steps based on three different levels that need to be covered and addressed for a sustainable and long-term quality development (for the three level concept of the introduction of quality development cf. Stracke 2006b, Hildebrandt/Stracke/Jacovi 2006 and Stracke/Hildebrandt 2007):[1]

- Level of the individual person
- Level of the organisation
- Integration of quality development involving all stakeholders

[1] Former research has shown that Support Systems especially designed for these purposes could be a strong and valuable help for all three levels and for the involvement of all stakeholders (cf. Hildebrandt/Stracke/Jacovi 2006 and Stracke/Hildebrandt 2007). The research findings presented here are partially results of Q.E.D., the flagship initiative for quality in learning, education, and training in Europe and worldwide, see: <http://www.qed-info.de>.

2. Benefits of Quality Standards

Quality standards are offering specific benefits for organizations, processes, and products. The quality standards themselves cannot guarantee high quality and success: it is always a question of the implementation and adaptation. Users of a quality standard will gain sustainable and significant advantages for their business if they are implementing and adapting the quality standard in a correct, appropriate, and long-term way that lives the idea of the quality standard.

Quality standards have got an impact in particular on seven main factors: The following figure lists these factors together with the main benefits of quality standards at a glance that can be identified in general related to the seven factors.[2]

Figure 1: The seven main benefits of quality standards

In summary, quality standards have got the potential to improve the organizations, processes, and products leading to high quality and business excellence. The benefits for e-Learning could be characterised in brief: In the following, we will discuss the first ISO quality standard for learning, education, and training as well as how it supports the quality development.

[2] For a detailed introduction of the seven factors and related benefits cf. Stracke 2009.

3. Quality Standards for Quality Development

Quality does not exist in a simple manner as we have shown before. First, all stakeholders have to define their own understanding what the term "quality" is standing for in relation to the given context. Then these different perspectives and opinions about quality have to be combined, to be brought into consensus and transferred into practice. The specification of relevant aspects and criteria to define quality as well as the application of these criteria into the given context of the organisation are quite abstract by itself. For this purpose a common reference framework is needed. The standard **RFDQ (ISO/IEC 19796-1), the first international quality standard for learning, education and training**, is providing such a common reference framework for educational processes and will be explained in the following.

The quality standard ISO/IEC 19796-1

The ISO/IEC 19796-1 standard was developed in consensus by the Working Group 5 "Quality Assurance and Descriptive Frameworks" of the standardisation committee ISO/IEC JTC1 SC36[3]. This quality standard was issued by the International Standardization Organization (ISO) in 2005 and contains the reference process model "Reference Framework for the Description of Quality Approaches" (RFDQ) to support stakeholders in learning, education, and training to document and (re-)define their daily business and processes. We will show that the reference process model is a valuable instrument for the implementation and establishment of quality development in LET.

The structure of the reference process model:

The **reference process model** of ISO/IEC 19796-1 called RFDQ is the integration of the following two main reference models (cf. ISO/IEC 2005) that will be described in detail below:

- the **generic process model** and
- the **generic descriptive model**.

The reference process model covers the whole lifecycle of learning, education, and training in general including e-Learning and blended learning. Therefore it can be used to describe any learning scenarios as well as any educational and vocational training product and learning solution. It is important to note that the reference process model does not include any regulations about the sequence of the processes or interdependencies between them as well as it does not give any instructions on its specific implementation in detail as a prescription or regulation. The reference process model serves as an open descriptive framework that always needs the adaptation to the organisation, the learning context, and the given situation.

[3] The abbreviation stands for: "International Organisation for Standardization (ISO)/ International Electrotechnical Commission (IEC) Joint Technical Committee 1 (JTC1) - Information Technology - Subcommittee 36 (SC36) - Information Technology for Learning, Education, and Training (ITLET)"; see: <http://www.iso.org/jtc1/sc36>.

The process model of ISO/IEC 19796-1:

The reference process model is based on the generic **process model** that is divided into seven process categories containing in total 38 processes. It is described by the following table:

ID	Category	Description	Processes
NA	Needs Analysis	Identification and description of requirements, demands, and constraints of an educational project	NA.1 Initiation NA.2 Stakeholder Identification NA.3 Definition of objectives NA.4 Demand analysis
FA	Framework Analysis	Identification of the framework and the context of an educational process	FA.1 Analysis of the external context FA.2 Analysis of staff resources FA.3 Analysis of target groups FA.4 Analysis of the institutional and organisational context FA.5 Time and budget planning FA.6 Environment analysis
CD	Conception / Design	Conception and Design of an educational process	CD.1 Learning objectives CD.2 Concept for contents CD.3 Didactical concept / methods CD.4 Roles and activities CD.5 Organisational concept CD.6 Technical concept CD.7 Concept for media and interaction design CD.8 Media concept CD.9 Communication concept CD.10 Concept for tests and evaluation CD.11 Concept for maintenance
DP	Development / Production	Realization of concepts	DP.1 Content realization DP.2 Design realization DP.3 Media realization DP.4 Technical realization DP.5 Maintenance
IM	Implementation	Description of the implementation of technological components	IM.1 Testing of learning resources IM.2 Adaptation of learning resources IM.3 Activation of learning resources IM.4 Organisation of use IM.5 Technical infrastructure
LP	Learning Process	Realization and use of the learning process	LP.1 Administration LP.2 Activities LP.3 Review of competency levels
EO	Evaluation/ Optimization	Description of the evaluation methods, principles, and procedures	EO.1 Planning EO.2 Realization EO.3 Analysis EO.4 Optimization/ Improvement

Table 1: The process model of ISO/IEC 19796-1

The process model (table 1) structures the lifecycle of learning processes, but it does not contain any prescriptions on the structures or procedures of how to deal with the stated processes.

The descriptive model of ISO/IEC 19796-1:

The structure how to describe each of the processes is provided by the generic **descriptive model** which is also part of the ISO/IEC 19796-1 standard. The description model defines a standardised way and a format how all processes belonging to the overall learning process should be described. The description model is not only a format for documenting the processes, but it also raises the attention of the stakeholders to aspects that have to be considered for defining the effected processes. Thus, it supports the users in reconsidering their current situation as far as it is related to the learning processes. The following table 2 shows the thirteen categories (attributes) of the description model which allow a consistent description of all processes from the process model:

Attribute	**Description**	**Example**
ID	Unique Identifier	ID1234
Category	Main Process	Course Development
Process Name	Process name	Method selection
Description	Description of the process	Within this process the didactic concept and methods are evaluated and selected
Relations	Relation to other processes	Before the method selection a target group analysis must be performed; FA.6
Sub-processes / sub-aspects	Sub-processes / sub-aspects / tasks	Method identification, method alternatives, method prioritisation
Objective	Objective of a Process	Adequate selection of one or more didactic concepts
Method	Methodology for this process Reference to guideline / documents	Method selection shall be based on the target group. Methods are selected based on the teachers' experience. See Method Guidelines Handbook
Result	Expected result of a process	Method specification Documents
Actors	Responsible / participating actors	Team Didactical Design
Metrics / Criteria	Evaluation and Metrics for this process	Criteria catalogue 3.2.2-3.2.6
Standards	Standards used	DIN EN ISO 9241, IEEE 1484.20.1:2007 Reusable Competency Definitions
Annotation / Example	Further Information, Examples of usage	See evaluation results from 2008 in the document: "ID1234_evaluation_results_2008.pdf"

Table 2: The description model of ISO/IEC 19796-1

The process of implementing and adapting the ISO/IEC 19796-1 standard in practice will be described in the following by introducing the adaptation model IDEA for the implementation of quality development in LET.

4. The Adaptation Model IDEA

The ISO/IEC 19796-1 reference process model is a generic model: This means that it cannot simply be implemented and used as it is, but instead it has to be adapted to every specific context of usage. In this chapter we will describe the process of implementing and adapting the reference process model of the standard in practice based on first gained experiences introducing the adaptation model IDEA as a helpful instrument.

In the implementation process of quality development based on the reference model of the quality standard ISO/IEC 19796-1, an individual selection of processes, which are applicable, has to be made and each of the selected processes has to be specified according to the current situation. [4] During this adaptation, the specific requirements and objectives of the current situation are considered and thus, become part of the model.
Since the process model covers any learning processes, it is applicable to any application scenario. Each scenario has got specific characteristics and focal points. In the planning phase of a learning opportunity (product or solution), the model provides valuable support especially for the analysis of the needs and the requirements. The reference process model supports customers defining a call for biddings as well as providers customising corresponding learning opportunities. In the development phase of learning contents, the model can be helpful for the design of a learning opportunity as well as for selecting and implementing an appropriate infrastructure. Moreover, the model also supports the production, implementation and realisation of learning opportunities as well as the continuous evaluation just from the beginning.

To achieve a holistic quality development the needs and requirements of all stakeholders of the current learning scenario have to be considered (Feigenbaum 1986; Ishikawa 1985; Soin 1992). This perception is also valid for the adoption and introduction of the reference process model: A strong procedure systematically planned is needed for adapting the reference process model of the standard ISO/IEC 19796-1 to a specific organisation including all stakeholders. Therefore simple to use quality tools as the following adaptation model IDEA can deliver helpful support.

The abbreviation IDEA stands for the four main tasks to introduce quality development:

- 1. Initiate!
- 2. Do!
- 3. Evaluate! and
- 4. Act!

These four tasks and their phases and steps were developed according to the Deming cycle and the ISO standard family ISO 900x (cf. Stracke 2006a). They have to be fulfilled for the implementation of quality development in LET: These phases and steps can be realized and applied according to the specific needs and the given situation of the organization including feedback loops, individually adapted sequences and parallel implementation.

[4] For different implementation objectives and use cases cf. Stracke (2009).

The phases and steps of the four tasks can be described and defined as follows:

- **1. Task: Initiate!**
  First the raising of the awareness of all stakeholders and their full involvement and participation is needed. In transparent procedures the vision for the quality development should be defined based on a common and shared understanding of quality for learning, education, and training and the innovations that should be achieved by the implementation of quality development. The long-term policies and strategies will be discussed and agreed upon the approved vision.

- **2. Task: Do!**
  For the starting implementation the quality model has to be selected (here in our case: RFDQ) and to be adapted as an application profile. Concerning RFDQ that means the selection of the appropriate and relevant processes in a quality profile. Then the specific definitions and success criteria has to be described, for RFDQ those are the attributes of the descriptive model, mainly the methods, actors, metrics and criteria. The preparation of the implementation will include all needed decisions and developments for the organizations. And finally the realization of all planning for the quality development and its integration into organizational processes is completing this task.

- **3. Task: Evaluate!**
  The evaluation will focus on three distinctive objects: First, the realization of the implementation of quality development itself as the main outcome of task 2. Second, the adaptation of the quality model selected and adapted at the beginning of task 2. And third, the evaluation of the initiation task 1 including the revision of the vision, strategy and policies for the quality development.

- **4. Task: Act!**
  The fourth task is dedicated to the sustainability and long-term impact of the adaptation and implementation of the quality development. The communication and further discourse with all stakeholders will guarantee the ongoing debate and consensus building on the quality definitions and common understandings. Based on the evaluation results, the adaptation of the quality model will be revised and the vision and strategy will be reviewed. Finally it should lead the whole organization to the establishment of a continuous improvement cycle for the quality development related to all tasks and steps from the other phases.

The following figure shows the adaptation model IDEA in an overview:

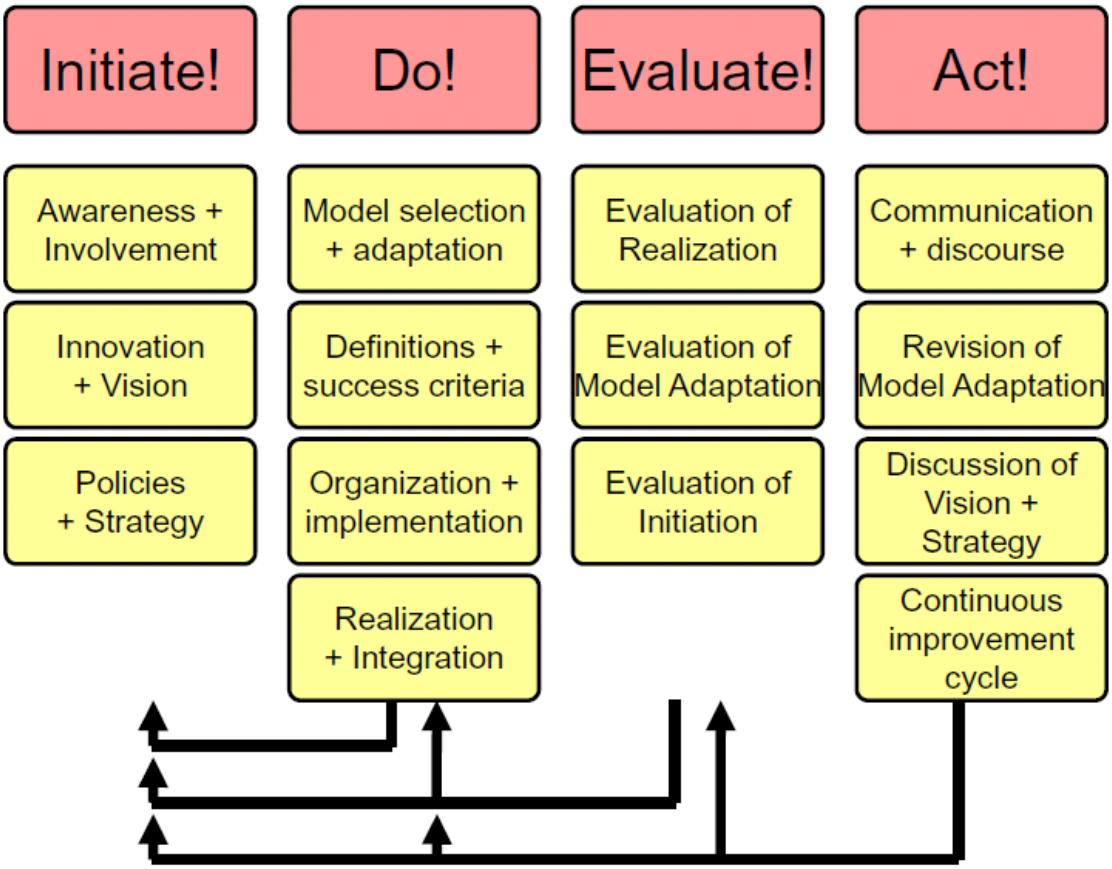

Figure 2: The adaptation model IDEA

The adaptation model IDEA was presented here by using the example of introducing the ISO quality standard RFDQ (ISO/IEC 19796-1). It is an appropriate model for establishing a continuous improvement cycle based on the principles of ISO 900x and the Deming cycle, in particular for the implementation of quality development in learning, education, and training by adapting RFDQ, the unique ISO quality standard for LET, to the specific organization and given situation.

Summary and Future Prospects

This article has presented and analysed the meaning and the relevance of quality development and quality standards for LET by highlighting their potentials and benefits and in combination with guidelines for the implementation of the first international quality standard for learning, education, and training RFDQ (ISO/IEC 19796-1). In particular it has introduced the Adaptation Model IDEA as a valuable instrument for the usage and implementation of RFDQ and any quality model.

Quality development is always depending on the given situation. The definition of quality development and the benefits of quality standards were presented in particular relation to LET. The establishment of a continuous improvement cycle is one main important benefit as the involvement of all stakeholders is one main aim for the introduction of quality development. It has been shown that quality standards are offering a valuable support for the adoption and implementation of quality development. Especially the first international quality standard for learning, education and training ISO/IEC 19796-1 was described in detail: It is an appropriate means for the adoption and implementation of a sustainable quality development that is covering all learning and business processes. We have pointed out the main tasks and potentials for its adaptation that is always needed for gaining an overall quality development with continuous improvement. Until now only promising experiences were gained by the implementation of ISO/IEC 19796-1: It is the demand of further research to evaluate the long-term benefits of the quality standard in practice.

For the facilitation and improvement of the broad application of quality development and in particular of the ISO quality standard RFDQ, the adaptation model IDEA was introduced and presented as an instrument for adopting and implementing quality development and standards by establishing a continuous improvement cycle.

In summary, it can be stated that the first quality standard for learning, education, and training ISO/IEC 19796-1 is a suitable and valuable instrument for the introduction and implementation of sustainable quality development in learning, education, and training in general and the adaptation model IDEA is a helpful instrument for this objective.

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