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# **Quality Standards for Quality Development in e-Learning:**

## **Adoption, Implemen- tation and Adaptation of ISO/IEC 19796-1**

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**Abstract:** This research study focuses on quality development in e-Learning 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. Especially the new quality standard for learning, education and training ISO/IEC 19796-1 offers a promising potential for the raise of quality awareness and the involvement of all stakeholders. The implementation and adaptation of the quality standard is the main focus looking at the specific situation and organisation.

## Introduction

In e-Learning there can be identified two main challenges today: The demand for overall interoperability and the request for (high) quality. This research study 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 e-Learning?" 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. Especially the first quality standard for learning, education and training ISO/IEC 19796-1 will be explained in detail. In summary, the implementation and adaptation of the quality standard demonstrate its support for the quality development in e-Learning.

## Quality Development in e-Learning

Quality development is a crucial task for education in general as well as for e-Learning. 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). Here we focus 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 (Stracke 2006b):

**Quality development** covers every kind of measurement, assurance, optimisation 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 requirements 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. Hildebrandt, Stracke, Jacovi 2006):

- *Level of the individual person*  
As the first step the building of personal quality awareness has to be addressed. The objective is to ensure that every stakeholder knows what quality development means and is standing for.
- *Level of the organisation*  
At the second step the whole organisation has to be included to develop a quality vision and a common understanding of the quality objectives and the resulting mission statements. Individual quality awareness is the necessary base for this.
- *Integration of quality development involving all stakeholders*  
The third step is looking for bringing the organisational vision and quality objectives into the educational and business process to become part of the daily business. The involvement of all stakeholders is important for ensuring their motivation and contribution.

In the following we will describe how quality standards offer a valuable support for the adoption and implementation of quality development.<sup>1</sup>

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<sup>1</sup> Former research has shown that Support Systems especially designed for these purposes could be an offer a valuable help for all three levels and for the involvement of all stakeholders (cf. Hildebrandt, Stracke, Jacovi 2006). The research findings presented here are results of the Quality Initiative E-Learning in Germany (Q.E.D.), a project running from 2004 to 2007, funded by the Federal Ministry of Economics and Technology (BMW) of Germany. For more information see: <<http://www.qed-info.de>>. The ongoing research and current results can be found here: <[www.qualitydevelopment.eu](http://www.qualitydevelopment.eu)>.

## 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 new standard **ISO/IEC 19796-1, the first quality standard for learning, education and training**, is providing such a common reference framework for educational processes and will explained in the following.

### The new 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<sup>2</sup>. 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 especially regarding e-Learning to document and (re-)define their daily business and processes. We will show that the reference process model can serve as a valuable instrument for the implementation and the establishment of quality development in learning, education, and training.

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<sup>2</sup> 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)"; more information online: <http://www.iso.org/jtc1/sc36>

### **The structure of the reference process model:**

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

- a **generic process model** and
- a **generic description model**.

The reference process model covers the whole e-Learning or blended learning lifecycle and therefore it can be used to describe any learning scenarios and any educational and vocational training offer. The reference process model can be characterised especially by the following aspects:

- **Integration:**  
Any providers, producers, customers and users of e-Learning and of educational and vocational training can use the reference process model. Therefore it provides a common reference framework for all stakeholders involved in educational processes.
- **Completeness:**  
All processes of educational projects and educational processes are addressed and covered by the reference process model. The reference process model can be adapted to any educational scenario by selecting only a subset or all of its processes.
- **Openness:**  
There is no regulation or prescription of any procedures or methods to be used within the processes of the reference process model, but there's a need for the specification of their mutual relations and interdependencies, of the involved actors and of the metrics and measurements regarding the requirements of the given context of usage.
- **Adaptability:**  
The sub-processes, objectives and results of all the processes of the reference process model are individually adaptable and expandable. This allows users to specify and adapt the process model to any given educational and organisational context.
- **Uniqueness:**  
The reference process model provides the basis for the only ISO standard especially focusing on quality in educational and vocational training until now.

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 or any specifications on its implementation. It serves as an open descriptive framework that needs always the adaptation to the organisation, the educational context and the given situation.

**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 sub-processes. It is described by the following table:

ID	Category	Description	Sub-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 educational processes, but it does not contain any prescriptions on the structures or procedures of how to deal with the stated processes.

### The description model of ISO/IEC 19796-1:

The structure how to describe each of the processes is provided by the generic **description model** which is also part of the ISO/IEC 19796-1 standard. The description model defines a standardised way and format how all processes belonging to the overall educational 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 educational processes. The following table 2 shows the twelve categories 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 1484.12.1:2003 Learning Object Metadata
Annotation / Example	Further Information, Examples of usage	

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

For the combination of both generic models, each selected process of the reference process model (table 1) has to be described according to the criteria from the description model (table 2). This integration of the two models results in the complete reference process model of the ISO/IEC 19796-1 standard covering seven process categories and 38 processes. First a



selection of appropriate processes from the process model has to be made depending on the current context of usage and second each of the selected processes needs to be specified in detail according to the description model. Thus, the reference process model provides a common basis for defining processes, a discussion basis for the involved actors as well as a guiding framework of aspects to be considered and specified in a given educational and organisational context. This process of implementing and adapting the ISO/IEC 19796-1 standard in practice will be described in the following.

## **Adoption, implementation, and adaptation**

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.

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. 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 educational processes it is applicable to any application scenario. Each scenario has got specific characteristics and focal points. In the planning phase of an educational offer 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 offers. In the development phase of educational contents the model can be helpful for the design of an educational offer as well as for selecting and implementing an appropriate infrastructure. Moreover, the model also supports the production, implementation and realisation of educational offers 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 educational 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 can deliver helpful support.

The introduction of the reference process model of the standard ISO/IEC 19796-1 can simplified be divided into the following two main steps:

### **1. Creating a context-specific quality profile**

The term *quality profile* defines a selection of processes of the 38 overall processes of the reference process model which are relevant for the specific context of usage and thus need to be considered. All processes of the process model need to be analysed by involving the different perspectives of the stakeholders with the aim to identify the relevant and applicable processes. For all processes which are considered to be not applicable to the given situation, a justification for this choice needs to be provided during the analysis phase. This analysis procedure ensures that first the stakeholders get to know the reference process model in general, that second they start to get a better understanding of the processes of their daily business and that third they get a first insight into the complex field of quality development and how to break it down into small and manageable parts. Only a subset of the 38 processes of the generic process model will be applicable in most of the cases, but of course there also might occur situations where all of the processes will remain part of the individual quality profile. Discussing the process model with all stakeholders ensures that a well fitting quality

profile as an individual model of the processes with regard to the current situation is developed which is on the one hand complete and on the other hand not excessive.

## 2. Specifying the individual process descriptions

After the development of the individual quality profile this originated individual model has to be filled with organisation-specific descriptions of each of the selected processes according to the description model of the standard ISO/IEC 19796-1.

First every process needs to be described and thus defined. In this phase the description and the thoughts about the business processes contribute to raising quality awareness on the level of each involved actor as well as on the level of the organisation and how to integrate quality measures into the educational and business processes. The definition and selection of appropriate quality means as well as the commitment and general agreement on corresponding instruments, measures and metrics need special attention. They are the base for the realisation of the objectives and outcomes of each process ensuring their measurements. An organisation that has already implemented an explicit quality management system can import and integrate its existing process descriptions into the quality profile. Quality development is an ongoing and continuous process: Therefore the quality profile (which means the individual selection of processes from the process model which have been considered to be important for the current scenario) as well as the process descriptions of each of the selected processes have to be analysed and evaluated according to their appropriateness. The more experience a user and the organisation are gaining in quality development and quality management, the more appropriate and complete the results of the used methods and instruments of quality management will become leading to a continuous improved quality development.

The reference process model of quality standard ISO/IEC 19796-1 can be used for different tasks and in different situations. The reference process model supports organisations especially concerning the following tasks and objectives:

- *Introducing and documentation of innovative process-oriented quality management:*  
In the case that there has not yet been implemented any explicit quality strategy throughout an organisation, the reference process model serves as a starting point to quality development in this organisation by providing support for introducing and implementing quality development for learning processes and educational and vocational training.
- *Analysis of an established quality management system:*  
If there is already an established quality management system focusing on educational and vocational training throughout an organisation, the reference process model allows the organisation to examine and analyse its quality development regarding the quality vision and the quality objectives of the organisation and their completeness.
- *Re-Design of processes and change management:*  
Since the reference process model contributes to the quality awareness of individuals as well as of the whole organisation it can also support the evaluation and if appropriate the (re-)design of the established quality management system in the sense of a broad change management towards sustainable quality development.

## Summary and Future Prospects

In this research study we have presented that quality development is always depending on the given situation. The involvement of all stakeholders could be identified as 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 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 educational 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 new quality standard in practice. In summary it can be stated that the first quality standard for learning, education and training ISO/IEC 19796-1 is a suitable instrument for the adoption and implementation of sustainable quality development.

## References

- Crosby, P. B. (1980). *Quality is Free. The art of making quality certain*. New York: McGraw-Hill.
- Deming, W. E. (1986). *Out of the Crisis*. Cambridge, MA: MIT.
- Deming, W. E. (1982). *Quality, productivity and competitive position*. Cambridge, MA: MIT.
- Donabedian, A. (1980). *The Definition of Quality and Approaches to Its Assessment [= Explorations in Quality Assessment and Monitoring, vol. 1]*. Ann Arbor: Health Administration Press, 1980.
- Feigenbaum, A. (1986). *Total Quality Control. Engineering and management*. New York: McGraw-Hill.
- Hildebrandt, B./ Stracke, C. M./ Jacovi, M. (2006). Support Systems for Quality in E-Learning. In Kommers, P./ Richards, G. (Eds.) *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunication 2006*. Chesapeake, VA: AACE, 151-158.
- Ishikawa, K. (1985). *What is Total Quality Control? The Japanese Way*. Englewood Cliffs, NJ: Prentice-Hall.
- ISO/IEC 19796-1:2005 (2005). *Information Technology - Learning, Education, and Training — Quality Management, Assurance and Metrics — Part 1: General Approach*. Geneva: International Organisation for Standardization (ISO).
- Juran, J. M. (1992). *Juran on quality by design. The new steps for planning quality into goods and services*. New York: Free Press.
- Juran, J. M. (Ed.) (1951). *Quality Control Handbook*. New York: McGraw-Hill.
- Soin, S. S. (1992). *Total Quality Essentials*. New York: McGraw-Hill.
- Stracke, C. M. (2006a). Process-oriented Quality Management. In Pawlowski J. & Ehlers, U. (Eds.) *European Handbook on Quality and Standardisation in E-Learning*. Berlin: Springer, 79-96.
- Stracke, C. M. (2006b). Interoperability and Quality Development in e-Learning. In *Proceedings of the Asia-Europe e-Learning Colloquy*. Seoul (in print).