



Quality in E-learning

The learner as a key quality assurance category



**Ulf-Daniel
Ehlers**

Zentrum für
Qualitätsforschung
im Bildungs- und
Sozialbereich
University of
Bielefeld

Quality will determine the future of e-learning. Many analyses have reached this conclusion ⁽¹⁾. The KPMG eLearning zwischen Euphorie und Ernüchterung (E-Learning Between Euphoria and Sobriety) ⁽²⁾ survey from November 2001 highlighted the fact that e-learning does not only depend on good technology, but should also pay much more attention to the corporate learning environment and the learner than it has to date and find effective ways to incorporate them ⁽³⁾. Berlecon, IDC (International Data Cooperation) and other institutes are recognising that although e-learning is a growing market, it will only develop its full potential when we can respond with high-quality e-learning concepts ⁽⁴⁾. Quality development and assurance is therefore becoming a central issue in the e-learning debate ⁽⁵⁾. Quality assurance concepts are featuring more prominently. In a wider context, the growing significance of the quality debate is affecting the entire education sector, not least as a result of the shock over the results of German pupils in the PISA study.

Quality development in education, and particularly in e-learning, is also increasingly taking centre stage throughout Europe. The European Commission is currently sponsoring numerous research projects for advancing and harmonising European debate on quality in e-learning as part of a pertinent initiative. For example, the European Quality Observatory (EQO) project (www.eqo.info) is building an Internet portal with options for analysing and comparing the different and competing quality systems in Europe ⁽⁶⁾. One of EQO's main objectives is to promote the integration of quality systems in education. Efforts are also underway to synchronise international debate on quality standards ⁽⁷⁾.

The particular relevance of quality development poses two immediate questions:

(1) What is quality? and (2) How can we assure it? Answering these questions is a major challenge, which we need to face if we want to raise the future profile of e-learning to the same level as traditional training measures. The good news is that e-learning does not invalidate the basic principles of quality assurance. We can therefore call on tried and tested ideas, models and methods when planning, developing and applying e-learning quality assurance concepts.

The bad news is that the drawbacks of conventional approaches remain. Therein lies the challenge. Ascertaining the actual nature of quality in e-learning opens up an extremely heterogeneous and opaque realm of concepts, methods and proposals. First we have to shed light on the mystery surrounding the definition of quality, then we must apply it consistently to e-learning.

Quality as a multifaceted concept

Learning quality – or educational quality in a wider context – is a multifaceted concept. It is not an absolute, it always depends on the situation in which it is employed. No European country has reached a social, political or academic consensus on what educational quality actually is. What we define as quality is therefore a normative setting which refers to a specific context. Consequently, situations and interests always influence its definition.

This applies even more to social and pedagogical services, since here we cannot follow patterns which are *virtual laws of nature* and always turn that which we deem 'suitable in its composition to fulfil a requirement ...' – i.e. quality (according to the ISO 900X definition ⁽⁸⁾) – into a negotiable issue between variously propounded academic theories and subject-

Quality is determining the future of e-learning. Many recent analyses and developments have reached this conclusion. Quality assurance will therefore acquire great significance. This poses two questions. What is quality? And how can we assure it? Finding answers to these questions is a major challenge, which we need to face if we want to raise the future profile of e-learning to the same level as traditional training measures.

The article takes this as a starting point and outlines key quality assurance factors which put learner needs first. It compares subject-based quality research with objective quality criteria. The result is a learner-integrating quality assurance approach. It examines the latest findings from the largest survey on quality in e-learning to date (Lernqualitaet.de) from an unprecedented learner perspective.



Quality dimensions

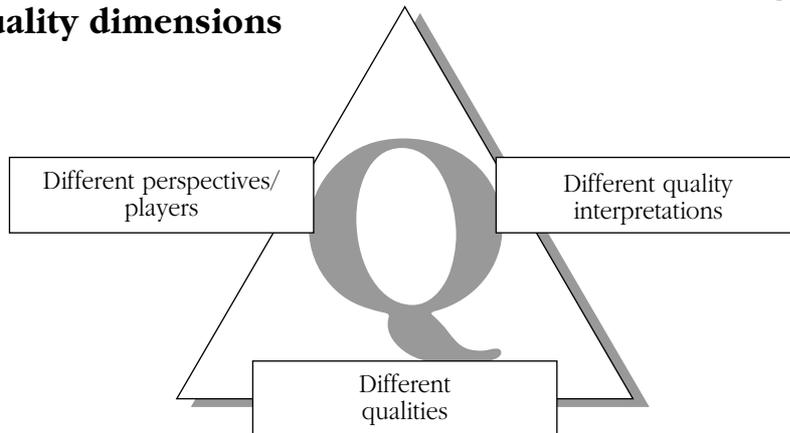


Figure 1:

We can distinguish between three fundamentally diverse elements in the discussion:

- different interpretations of quality
- different players with different perspectives of quality
- different forms of quality, e.g. input, process, output

Together, these three basic elements provide a frame of reference for all debate on quality.

Quality reflected in various meanings

One dimension of quality is the differing interpretations of the term. Numerous definitions from various fields are available. For example, economics⁽¹⁰⁾ adopts the *product-based approach*, which defines quality as a physical characteristic. Thus the quality of a piece of jewellery depends on its gold content, and the quality of a whiskey on its length of storage. There is also the *user-based approach*, which relates to individual customer preferences. Quality is defined in terms of user-friendliness. Under this interpretation, optimal fulfilment of demand signifies the best-possible quality. An oft-borrowed book therefore attains a higher quality than a seldom-loaned volume. User preferences are the determinants. We also have the *production-based approach*, which stems from the manufacturer and sets standards, compliance with which equals quality. Here, the primary goal is functionality, so a Swiss precision watch could have the same quality as a no-name product from Hong Kong. All books that do not fall apart have the same quality.

Of course, these attempts at definition cannot simply be transferred to the education sector. Unlike business, education does not involve classic supplier-customer relationships. It is an association of co-producers. An e-learning programme supplies technology and content, but it is down to learners themselves to actively use it, i.e. learn. The interaction between the learning programme and the learner is known as a co-producer relationship⁽¹¹⁾.

tive political and social interests. Donabedian (1968) highlights the relational character of the term in his definition of quality. 'Quality is the degree of conformance between a performed service and the goals set for the service⁽⁹⁾'. In this sense, quality describes a relationship. Evidently, discussion of quality involves considering a metatheoretical category which concerns the composition of the object under scrutiny.

The origins and impact of the quality debate, which now encompasses a large section of society and affects many social sub-segments, are no longer easily visible. However, we can observe that quality is becoming an increasingly important and desirable category in individual and social contexts. We can regard quality more and more as a subjectively individual and collectively influential category. Achieving good/top quality is a hotly debated and much-sought-after goal in all sectors of society. Even language bears witness to the concept's significance, as the renaissance of phrases such as 'quality of life', 'quality of services', 'product quality' and 'water quality' shows. The very impact of the word 'quality' on behaviour demonstrates its meaning. The word merely signifies 'composition' (Latin *qualis*), but in everyday language it is used to distinguish a characteristic of an object as being of a higher calibre than that of another object.

To critically analyse quality, it is helpful to identify the basic points of the debate.

In education we can currently identify around five different meanings or inten-

⁽¹⁾ See also Ehlers et al., 2003, particularly Chapter 6.

⁽²⁾ Cf. KPMG, 2001.

⁽³⁾ A UnicMind study, 'E-Learning and Knowledge Management in Major German Enterprises', also airs this problem (2001).

⁽⁴⁾ Berlecon Research (2001) elaborates this subject in its study *Wachstumsmarkt E-Learning: Anforderungen, Akteure und Perspektiven im deutschen Markt (E-Learning Growth Market: Challenges, Players and Prospects in the German Market)*.

⁽⁵⁾ See also Ehlers, 2002 on development of e-learning.

⁽⁶⁾ Pawlowski (2003) describes the research project in detail.

⁽⁷⁾ For example, Germany's Deutsches Institut für Normung (DIN), Europe's CEN and ISSS and the ISO organise workshops on this topic.

⁽⁸⁾ We can find an explanation of the ISO quality definition and parameters in Gräber 1996, for example.

⁽⁹⁾ Donabedian, 1968.

⁽¹⁰⁾ Cf. Müller Böling, 1995.

⁽¹¹⁾ Cf. Fendt, 2000, p. 69; Ehlers 2003, Chapter 3, for example.



tions for the term 'quality' ⁽¹²⁾, some of which resemble the definition examples in economics:

- quality as an exception describing the surpassing of standards
- quality as perfection describing the state of flawlessness
- quality as functionality referring to the degree of utility
- quality as an adequate return measured by the price-performance or cost-benefit ratio
- quality as a transformation describing the above-mentioned co-producer relationship between the learner and the learning programme and referring to the learner's progress via a learning process.

Quality in the clash of perspectives

However, there are not only different interpretations of quality but also various players' interests and perspectives ⁽¹³⁾: the enterprise – the user of the training measure, the tutors supervising an e-learning programme, the personnel managers who establish the framework for continuing training in their sector, and the learner. Each of these four players generally has divergent interests and differing quality requirements and interpretations. We must therefore regard quality not as a static element, but as a negotiable relationship between the players involved in the social process.

Quality at all levels

Last but not least, quality can also refer to different education levels or processes. We can cite the different levels of the famous quality triad (according to Donabedian) as examples:

- training measure **prerequisites** (input/structure quality): availability and capability of computers or tutor qualification for of e-learning;
- the **learning process** (process quality), i.e. the interaction of learners, learning format, corporate learning culture, learning content and desired training goals – or;

- the **result** (outcome quality) of e-learning, i.e. the increase in learners' professional competence.

Defining quality therefore involves navigating this multidimensional space ⁽¹⁴⁾. There is no easy answer or standard quality assurance solution. We have (unfortunately) had to abandon the hope of only having to define quality criteria once to be able to appraise e-learning courses and formats properly in future. Ultimately, e-learning measures strive to boost learners' professional competence. A key factor in e-learning will thus be quality orientation which spans all processes and puts learners first. They must take pole position in e-learning quality concepts, since their professional competence is at stake ⁽¹⁵⁾. Researchers and politicians are called to establish exactly what this involves. However, we can already clearly identify several fundamental requirements which the new learning formats and social developments impose.

Learner-integrating quality assurance

It is imperative that we do not perceive a new focus on learner needs merely as a whim of fashion. Below we will therefore list and explain basic dimensions of learner-integrating quality assurance. We can use two main arguments to justify strengthening the learner perspective:

- a **paradigm shift** with consequences for defining learning quality is appropriate and necessary for quality assurance in e-learning;
- investigating quality from a user perspective entails integrating learner-oriented quality development at **all levels** of the training process.

The following section lists reasons for prominently integrating learner variables in quality models and traces the consequences for the quality assurance process.

Paradigm shift in quality assurance

A paradigm shift has been evident in continuing vocational training for some time: a move from lecturing to enabling – from

⁽¹²⁾ Harvey/Green, 1993, p. 9ff present an analysis of interpretations of quality in education. Wallmüller, 1990, p. 7f also features a systematic assessment of quality concepts, though this is more generalised and is not specifically related to education.

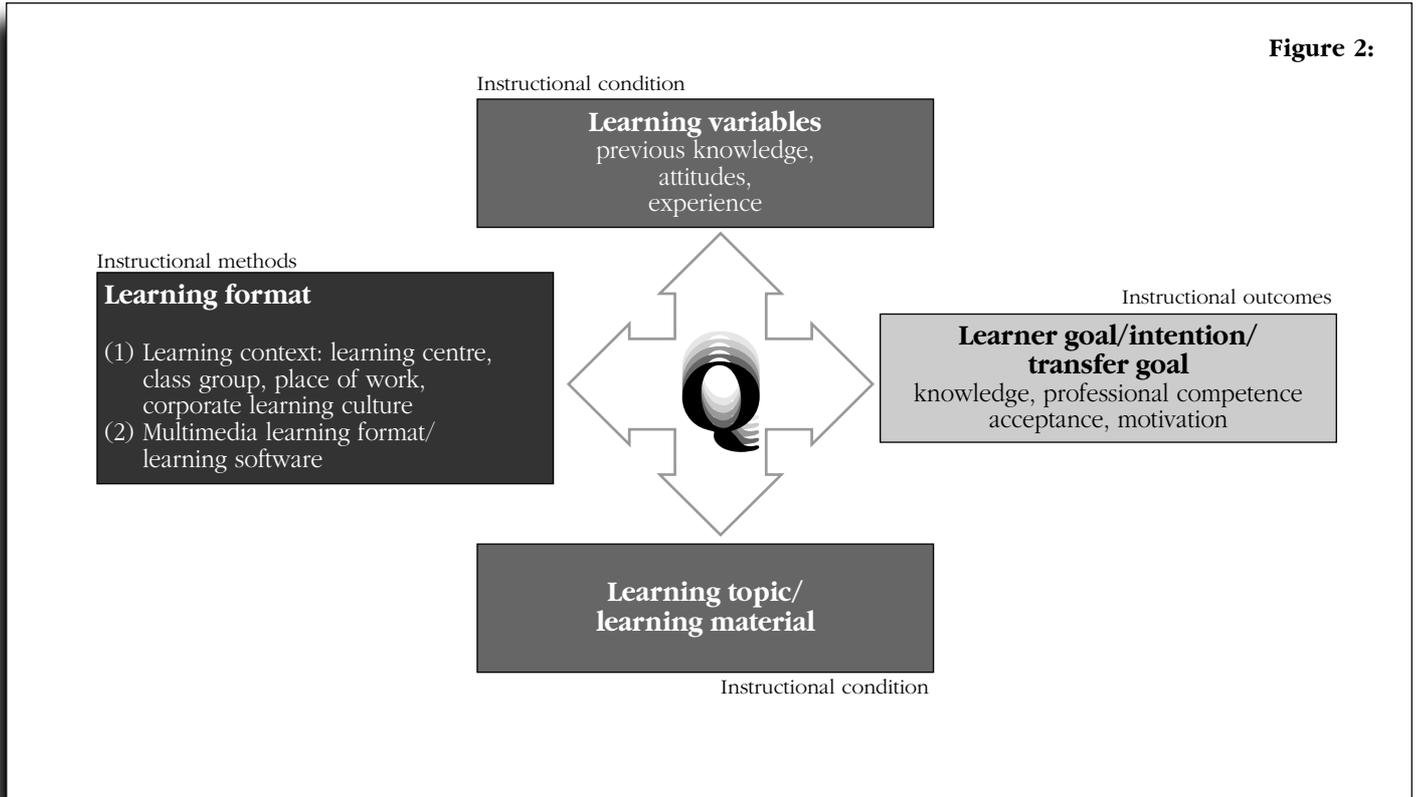
⁽¹³⁾ Cf. Fischer-Bluhm, 2000, p. 680; Ehlers, 2003, Chapter 3.

⁽¹⁴⁾ Cf. Fischer-Bluhm, 2000, p. 680f.

⁽¹⁵⁾ Professional competence here has a broader sense of 'ability to interact creatively with one's environment in a complex world'.



Figure 2:



behaviourist to cognitive didactics and from instructionalist to constructivist approaches ⁽¹⁶⁾. E-learning opportunities are generally radicalising this development. They pave the way for previously non-existent need orientation and programme individualisation – not least by replacing teaching along the lines of ‘one for many, now and here (Taylorist principle) with teaching/learning organisation which advocates ‘need-oriented learning, any time, anywhere’.

On the whole we can see that learners are being granted more and more say in defining continuing training quality ⁽¹⁷⁾. This applies to e-learning in particular. We can identify four reasons for this development: (a) from an **economic point of view**, learners are having to make an increasing financial contribution, either directly, by paying for private further training measures, or indirectly, by sacrificing leisure time to participate in further or continuing training organised by the company; (b) from an **educational and didactic point of view**, this is reflected in less lecturing and more hands-on experience. This change originates in

a shift from behaviourist learning theories to cognitive learning models and from instructionalist to constructivist approaches. This generally involves less standardisation and more orientation to situation and subject; (c) at a **social level**, one reason lies in the emergence of the knowledge society. Globally available knowledge currently doubles every four to five years. U.S. sociologist Richard Sennet ⁽¹⁸⁾ predicts that American college students will change jobs eleven times during the course of their career and completely renew the basis of their knowledge three times. This lifelong learning process is individual and cannot be standardised. The challenge for e-learning programmes is to match individual requirements as closely as possible to the available learning formats; (d) **e-learning’s special traits** are a fourth reason for learners’ increasing influence on definition of quality in this area ⁽¹⁹⁾:

Access and learning forms: individual access to software has eliminated the need for standardised times and shared, public locations for learning processes. Learning primarily takes the form of private study,

⁽¹⁶⁾ Harel et al., 1999; Jonassen, 1996; Reeves, 1999; Wilson et al., 2001 and others describe this development.

⁽¹⁷⁾ Cf. Gnahs, 1995.

⁽¹⁸⁾ Cf. Sennet, 1998.

⁽¹⁹⁾ Cf. Baumgartner, 1997.



often at home, independently of teachers or other learners. E-learning facilitates individual, unrestricted access to material any time and anywhere. It also offers a wealth of learning forms: classroom phases, virtual self-study, tutor support, working and sharing with other learners. This range of possibilities allows individual tailoring of learning opportunities.

Status quo and needs structure: groups of e-learners may have a heterogeneous **status quo**. This applies particularly to demographic components (professional status, level of education, etc.), content (previous knowledge, skills, etc.) and learning experience. Uniform learning backgrounds within the group, such as those found in a classroom-based scenario, cannot automatically be assumed. This has a special bearing on the option of tailoring learning processes to individuals. Whereas traditional group teaching only works with relatively homogeneous backgrounds, e-learning is not subject to this restriction. Moreover, learners themselves are responsible for determining when, how long and how often they study.

The **need structure** usually has a similarly heterogeneous status quo. The envisaged objectives and related motivation structures of media-supported learning are entirely open. However, these diverse needs not only influence learning success, but are also instrumental in defining it. The number of goal structures is manifold: course participation inspired by personal interest in a subject is just as feasible as acquisition of an additional professional qualification or continuing training to gain a skill which has become indispensable for normal working life. A group of learners on one e-learning programme may pursue a very disparate range of goals.

Freedom of programme selection: e-learning gives learners the chance to decide for themselves how quickly they wish to learn, at which times and which section they want to focus on, skip or intensify. Learners can largely choose their own topics, schedules and strategies. Each person can decide individually which content, section or course they digest, when and how. Scope for such individual organisation of learning also engenders individual quality requirements.

To summarise, all four reasons – economic, educational/didactic, social and special e-learning traits confirm that learners should be more instrumental in defining the nature of learning quality. For quality assurance this specifically means that learner variables gain more weight in relation to the other learning process variables.

The ‘paradigm for constructing and evaluating multimedia learning environments’, which Rainer Fricke ⁽²⁰⁾ devised, drawing on proposals from Reigeluth ⁽²¹⁾ and himself ⁽²²⁾, clearly illustrates the relationship between learner variables and learning formats. Fricke avers that a learning format’s effectiveness depends on four factors:

- the **learning environment**: both the multimedia system (LMS) and the social learning environment (corporate learning culture, locations, etc.);
- the **learner** or the learner variables: previous knowledge, education, learning skills, media skills, interests, expectations, goals, etc.;
- the **learning topic**: content and presentation of study material;
- the (intended) **learning outcome** or objective: goals to be achieved via learning, such as promotion as a result of increased professional competence.

An e-learning format only takes shape when all four of the listed factors unite. All four aspects influence learning success, learning effectiveness and quality. The quality of an e-learning format therefore depends on the interaction of all four factors. The depicted paradigm shift boosts the significance of the learner variables within the entire learning format. This does not mean disregarding all other factors and treating learner needs the same as before but using technological or content-based/curricular learning process aspects. It merely involves **shifting the emphasis** on learner factors.

Four consequences for quality assurance in e-learning

Giving learners a key position in quality assurance has consequences for what we

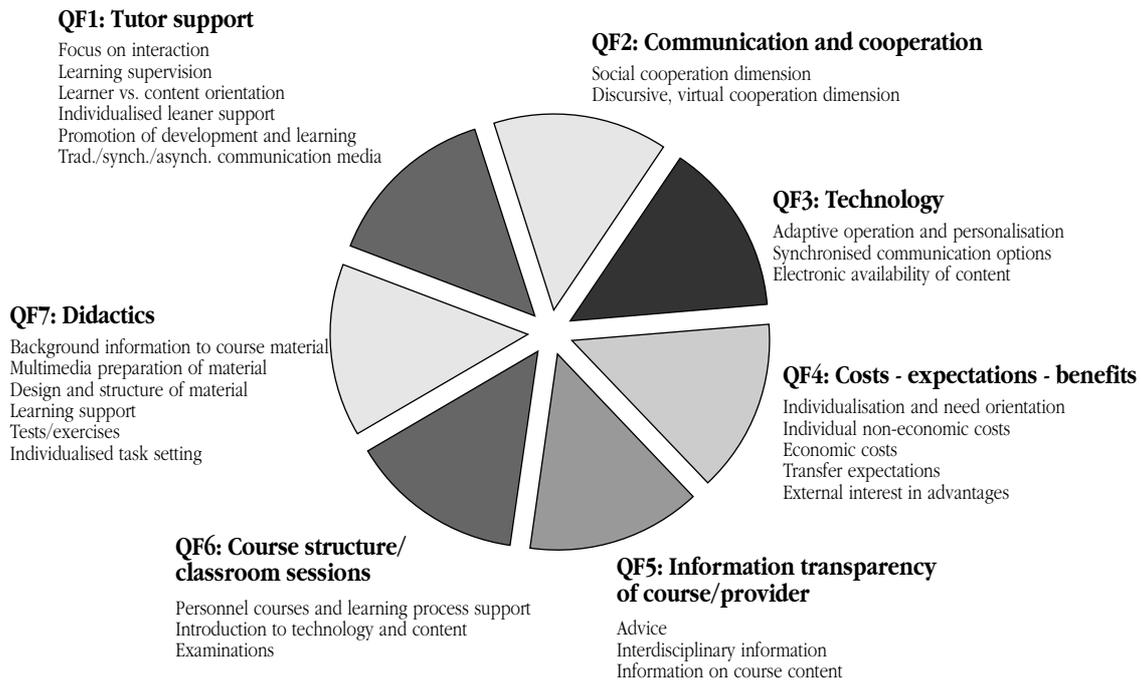
⁽²⁰⁾ Cf. Fricke, 1995, p. 405.

⁽²¹⁾ Cf. Reigeluth, 1983, p. 22.

⁽²²⁾ Cf. Fricke, 1991, p. 15.



Figure 3:



define as quality in e-learning. The following four points will explain their relevance for quality assurance in e-learning programmes.

Consequence 1: From technological orientation to clear user orientation

The maxim for e-learning should be ‘technology-supported but not technology-oriented’. The quality of the course does not hinge on what technology can achieve, but on how the appropriate technology can be used to tailor content, methods and situation to learners’ needs. Studies show that (qualitatively) poor CBT which is sensibly embedded in a learning format can produce better results than (ostensibly) good programs which are not used sensibly ⁽²³⁾.

Consequence 2: From programme orientation to learner orientation

This does not just mean rehashing the generally accepted principle of participant orientation without further reflection and merely considering how programme presentation and design can be made more user-friendly and adapted to the specific situation. This is undoubtedly important

and correct. However, the paradigmatic shift goes one step further. It involves a change in perspective. Hence the question is not what training measures can be offered to staff, but what do they need now and in the future in which areas, and what forms of teaching suit their career and level of education?

Consequence 3: Quality originates in learning (and with the learner)

The depicted paradigm shift has far-reaching consequences for defining quality and quality assurance in e-learning. This viewpoint does not regard learners as course consumers but as co-producers of their own learning success. From this perspective the widely advocated economic view of the learner as a customer is unacceptable. On the whole it appears that the common definition of quality as ‘what the consumer wants’, now popular even in education, which was triggered by the transfer of different quality management philosophy principles (e.g. TQM) from industry to social services, and to education since the late 1980s (Berwick, 1989), sheds little light on what quality really is. It is not even easy to establish who the consumer in vocational training is. Is it the

⁽²³⁾ Cf. Schenkel, 1995, p. 22.

⁽²⁴⁾ Cf. Müller Böling, 1995.

⁽²⁵⁾ Cf. Behrendt, 1998.

⁽²⁶⁾ Cf. Meier in Schenkel, 1995; Zimmer/Psaralidis, 2000; Behrendt, 1998; Schenkel, 1995; Behrendt, 1998, p. 43ff; Schenkel, 1995, p. 13ff.



organisation making a demand – the company which sends its staff on further training – or is it the course participants themselves? Moreover, learning processes are not a service which an education provider must supply to or for a potential customer. They require the cooperation of the ‘customer’ (i.e. learner). We therefore assume co-production of the training product in education and social affairs.

Quality only results when the learner interacts with the learning format: i.e. only when learning takes place (co-production in learning success). An e-learning format has no learning quality in itself. It merely supplies the framework (the format) to support the learning process.

Consequence 4: Quality promotion instead of quality assurance?

Most of the evaluation concepts for assessing learning software applied in quality assurance processes today follow a so-called mechanical model of impact research (Müller-Böling also refers to an *ex ante* evaluation model⁽²⁴⁾). Learning software which has been tested according to certain quality criteria (e.g. AKAB, MEDA '97, etc.) is used to achieve a particular effect – growth in workers' professional competence. This neglects to consider that evaluation of learning software says nothing about its potential impact. Rather, investigations such as the case studies Erich Behrendt has performed in several sectors⁽²⁵⁾ reveal that not only the learning software but also the learning formats, the corporate working, learning and management cultures and learner motivation, activity and guidelines for behaviour are deciding factors for effective e-learning. This confirms that learning quality involves the interaction of various givens, only one of which is software.

Quality only ensues from the harmonisation of learning requirements, the e-learning format and other contextual aspects. Prognostic standards barely hold water as forecasts of learning quality⁽²⁶⁾. After all, quality can only be achieved through constant optimisation – or promotion – of this interaction. It therefore makes sense to strive for quality promotion rather than quality assurance in future, since only standards can be assured. That does not mean that from now on, all standards

Figure 3:
Subjective quality model
Quality segment 1: Form of tutor support Quality requirements which learners regard as significant for online tutor support: assigned tasks, behavioural guidelines, rights to tutor time, tutor qualification requirements and information on desired communication media.
Quality segment 2: Online course cooperation and communication Quality requirements which learners impose on communicative and cooperative online learning processes. These concern specific forms and options of communication between the learning process participants, and their design ⁽²⁸⁾ .
Quality segment 3: Learning technologies Quality requirements which learners impose on selected technological components in an online learning platform.
Quality segment 4: Costs – expectations – benefits Learners' cost-benefit considerations also play a vital role in e-learning quality assessment. Learners' investment in online continuing training and the ensuing results, e.g. improved professional competence in a work context, must be in an appropriate ratio ⁽²⁹⁾ .
Quality segment 5: Information transparency Quality requirements for information on online training providers and the courses they offer. The main question is: What course and provider information should learners have access to, and what advice services are needed to create transparency?
Quality segment 6: Classroom sessions Quality requirements for course structure, particularly classroom sessions: design and frequency of classroom sessions, study advice services, timetables and organisation, evaluation of online courses.
Quality segment 7: Didactics The didactics segment covers content, learning goals, methods and materials. Quality requirements chiefly affect the following aspects: course material background information, media-compatible multimedia material design, sectioned and structured course material, promotion of learning competence, feedback via exercises and monitoring of learning progress, individual tasks adapted to learners' personal goals and abilities.
<small>⁽²⁸⁾ These can be learner-learner interaction, learner-tutor interaction, learning group-tutor interaction, learner-expert interaction, etc. The element of learner cooperation is seen to be linked very closely to the concept of collaboration, i.e. cooperation here does not signify work division, but describes shared cognition in a spatially divided learning system.</small>
<small>⁽²⁹⁾ However, costs are not restricted to the financial aspect. The time learners invest, the difficulties of self-organisation and commitment to self-motivation involve considerable sacrifices for learners. On the plus side, learners can harvest various other fruits from their efforts as well as a financial ROI.</small>

should be annulled, but it emphasises that providers and services are only the framework model. Learners are the primary sculptors of their e-learning process and hence the learning quality. It is they who





Figure 4:

Target-group-specific quality profiles (selected characteristics)

The individualist

(N=328)

Content-oriented

- Content-based quality requirements
- Individualised programmes
- Didactic structure
- Self-directed learning
- Classroom sessions, interaction and communication

The results-oriented learner

(N=235)

Independent and goal-oriented

- Individualisation
- Standard programmes
- Work-integrated learning
- Instrumental purpose orientation
- Learning and media competence
- Classroom sessions, interaction and communication

The pragmatist

(N=293)

Need-oriented

- Individualised programmes
- Practical tutor support
- Non-economic costs
- Information & advice
- Personalisation of the LP
- Didactic requirements

The avantgardist

(N=392)

Interaction-oriented

- Discussion/communication
- Learner-oriented tutor support
- Avant-gardist media/technology
- Virtual learning groups
- Information & advice
- Variety of teaching methods

Lernqualitaet.de – quality research from a learner perspective

The *lernqualitaet.de* – Qualität aus Lernaltersicht (Quality From a Learner Perspective) study⁽²⁷⁾ takes this issue as its starting point. It has two innovative goals. First, it aims to define quality from a learner point of view. Second, it moves away from the common practice of applying the same quality equally to all learners. Instead, it creates target-group-specific quality profiles. The results show that quality criteria do not apply equally to all learners. These findings prove that the common practice of developing quality according to generally applicable criteria makes no sense.

The research project provides the first-ever empirical classification of subjective e-learning quality requirements. This now sets the stage for viable and appropriate quality development for networked learning courses focusing on learner needs.

Comprehensive e-learning services for learners

A subjective quality concept for online learning formats must consider more and broader determinants than 'mere' didactic or technological aspects, as the survey results show. They reveal that learner quality requirements for e-learning can be divided into seven quality segments:

It is clear that learners in a self-directed learning process desire assistance from a network of supporting learning services. Moreover, we can see that learners' quality requirements apply to the entire continuing training process and not just the learning process. Learners also attach importance to learning conditions (structure quality) and results (output quality).

Target-group-oriented quality concepts

The survey shows that quality requirements differ from learner to learner and depend on various aspects, such as educational experience, individual learning competence and socioeconomic factors. The survey compiles target-oriented quality profiles from the wealth of individual quality requirements, which appropriately

learn. It goes without saying that e-learning courses must conform to minimum standards. But minimum standards do not themselves imply any learning quality.

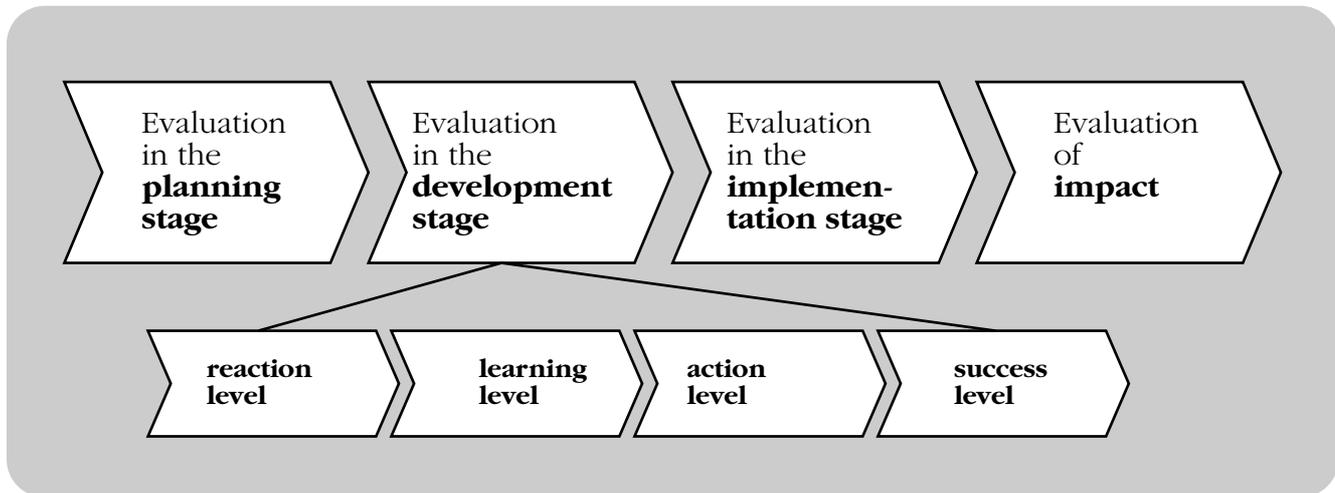
Learner-oriented quality development

The vital role of the learner, which the four cited consequences for quality assurance in e-learning stress, indicates the future need for reliable learner-oriented quality research. This particularly involves setting determinants for quality definition from a learner point of view and fixing them so that they can be employed in constructing concrete e-learning programmes. The fundamental question is therefore, what are significant factors of e-learning quality *from a learner perspective*? The status of learners must be re-considered.

⁽²⁷⁾ The study was performed at the University of Bielefeld (Ehlers 2003) and will be published in Germany in spring next year (2004). More information on the Internet at <http://www.lernqualitaet.de>.

Figure 5:

Evaluation model for comprehensive quality assurance (Kirkpatrick, 1994)



reflect the existing differences in e-learners' quality demands. These prototypical profiles can act as models for learner-oriented quality development. Analysis suggests that the following target group structures would be viable (Figure 4):

❑ **Content-oriented individualists**, who want to learn independently and do not consider tutor support vital for high quality. They have little need of support services. Their quality requirements only concern content. They attach no importance to communication and interaction.

❑ **Independent goal-oriented or results-oriented learners**, who use e-learning chiefly to achieve a previously defined objective and require only the support necessary for this. They are satisfied with standard programmes and attach no importance to individually tailored learning formats.

❑ **Need-oriented pragmatists** are interested in communicative discussion but adopt a practical approach, focusing on what is absolutely necessary. Extreme individualisation of the learning programme is not a priority, and they do not regard special application of various media as a prerequisite for high-quality learning formats.

❑ **Interaction-oriented avant-gardists** perceive quality in a comprehensive palette of support services. They are interested in improving learning competence as well as attaining specific goals. They require an interaction-oriented learning format which incorporates a rich and varied use of media.

We can assign a different set of quality factors from the seven subjective quality model segments to each target group. The study proves that quality development for learning formats intended to facilitate self-directed learning must take very different learner quality definitions and requirements into account. This applies particularly to guidance services which take the form of advice or tutor support. Consideration of target-group-specific quality needs is therefore a strategic success factor for providers of continuing e-training. If e-learning is to reap the benefits of these new findings, it must develop tools which integrate them into *all* levels of the electronic continuing training process. In the next section we will present a feasible evaluation approach which analyses the different education process stages, apply it consistently to e-learning and couple it with the learner orientation model developed above.



Evaluation in the planning stage

Evaluands

- Target-group-specific prerequisites:** Previous knowledge, interest in the quality measure, expectations, participant media application skills, information on educational context, learning competence, self-organisation/self-direction, how does the learner define learning success? (subjective quality model and target-group-related quality concepts)
- Contextual prerequisites:** onsite organisational/technical requirements, corporate learning culture, private learning environment, etc.

Methods

- Qualitative methods: survey, observation

Evaluation in the development stage

Evaluands

- Target-group-applicable pedagogical design of course/learning modules and course structure (e.g. blended learning vs. purely virtual self-study)
- Ergonomics
- Acceptance
- Motivation effects
- Do the concepts suit learner requirements? (subjective quality model and target-group-related quality concepts)

Methods

- Formative evaluation through iterative optimisation loops, observation, behaviour recording, log file analyses, tests and checklists

Evaluation in the implementation stage

Evaluands (subjective quality model and target-group-related quality concepts)

- Reaction level:** How do learners react to the course? What form should the e-learning programme take to generate a positive reaction from learners?
- Learning level:** What are the learning results? How can the learning process be influenced positively?
- Activity level:** Were learners able to use the learning content for their own purposes, e.g. transfer it to their work situation? Has professional competence increased (reconstructive analyses)? What form should an e-learning course take to support learners in developing initiative and competence?
- Level of success:** What impact does continuing training have on learners' situations, e.g. their status in the company or workplace? Was the e-learning measure a success for the learner?

Methods

- Combination of qualitative and quantitative methods: Surveys, observations, tests

Evaluation of impact

Evaluands

- Has the continuing training measure achieved the desired success (e.g. in a corporate/organisational context)?
- Have the individual or organisational goals (corporate training) been attained?
- Is the desired increase in the learner's professional competence visible?

Methods

- Cost calculation (ROI), staff discussions (quality management), reconstructive analyses of increase in professional competence



Assuring quality at all levels

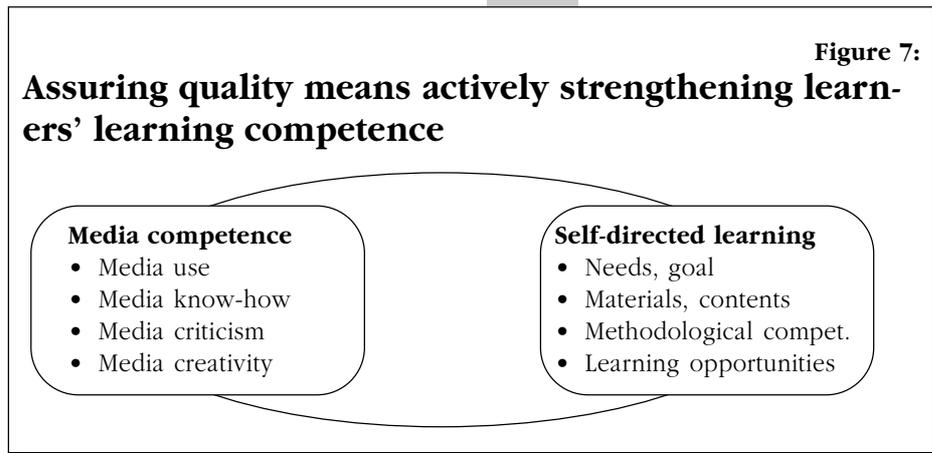
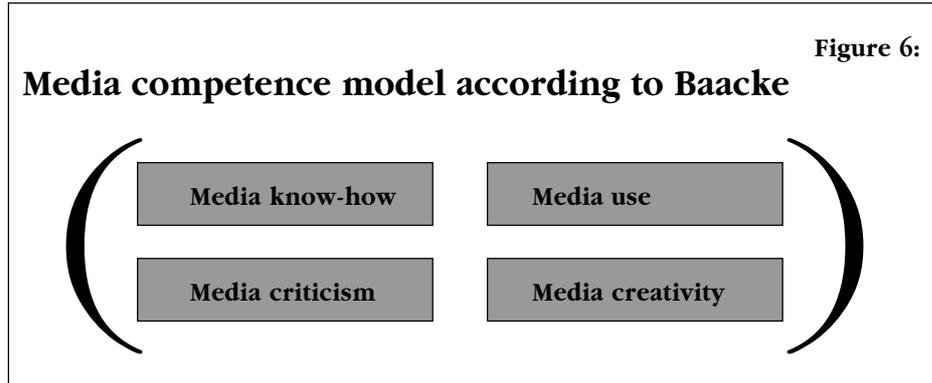
Until recently, monitoring the success of continuing training measures was limited to asking participants how satisfied they were, and at best, to examining direct learning outcomes ⁽³⁰⁾. Now, however, detailed evaluation models are also available for e-learning (for learning software and online learning formats). In general we can affirm that quality assurance is more than simply monitoring direct learning effects. It considers all determinants (see Figure 5): learner, learning topic, desired results and both the technological and the social learning environment (place of work, corporate learning culture, private learning situation, etc.).

Quality assurance does not solely consist of good planning and preparation. It must extend to all phases of the training process and involve the learner. It begins with quality awareness and ends with assurance of the transfer function, which is the ultimate aim. A tailored evaluation concept is also essential for ensuring quality.

It is vital to consider every stage of the training process, from planning, through development and implementation, right up to transfer assurance.

It is a widespread misconception that e-learning has only to be well planned and prepared to achieve the desired outcome. A detailed quality assurance concept might mirror Figure 5. It spans all stages of a qualification process and goes beyond standard evaluation procedures ⁽³¹⁾ for continuing training measures by incorporating the planning and development stage and the impact of the measure (e.g. return on investment in company training) as well as assessing the implementation stage in detail.

Each level must consider the four factors of learning format, learner, learning content and learning outcome/intention. Consideration of learner variables is particularly important. Thus, quality assurance involves integrating the learner in every phase of planning, development and execution. **Learner-integrating** quality assurance should therefore include at least the following evaluation questions, which render it possible (summarised on page 12).



Outlook: Promotion of learning competence as a quality condition

It is clear that learners are becoming more relevant and taking centre stage in quality development. However, a further aspect is essential for establishing quality in learning: the learning competence of learners themselves. In 2001 Stiftung Warentest (the German consumer evaluation foundation) published a survey which examines whether a Stiftung Bildungstest (education evaluation foundation) would be advisable in the German training provider landscape. It concluded that an institution of this kind is urgently needed, because ...

'... autonomous decisions by private users presuppose the existence of comprehensible markets. Ideally consumers should know what is on the market, in what qualities the desired product is available on the market and what price-performance ratio is appropriate to their requirements.' (Stiftung Warentest Dec. 2001)

⁽³⁰⁾ Bliesener, 1997, p. 163-167.

⁽³¹⁾ Kirkpatrick proposes a four-stage evaluation model for training programmes, which still constitutes the standard evaluation approach in the U.S. (Kirkpatrick, 1994).



However, to make these decisions, learners must first identify their needs. They must know what training they require or wish to obtain in the course of their life-long learning process. They must develop their own definition of quality. They must become their own training manager.

Only when learners are capable of doing this will they be in a position to proactively shape their own learning success and positively influence learning quality. E-learning providers and enterprises/other work organisations are 'only' facilitators in this scenario. Learners can then assume a high degree of *responsibility* for the learning quality of training processes. For both learners and providers bear responsibility for the learning process and hence for the quality of all learning in the co-producer relationship between training programme and learner. Assuring quality therefore always entails strengthening learner competence in this way. Against this backdrop, 'training for self-training' (learning to learn) gains significance. What is necessary for acquiring this competence?

Training programmes should aim to impart **media skills** to learners. They must also foster media creativity and a critical approach to media-based information over and above pure media competence. According to Baacke, comprehensive media competence comprises four dimensions ⁽³²⁾:

Bibliography

Baacke, D. *Medienkompetenz*. Tübingen: 1997.

Baumgartner, P. Evaluation vernetzten Lernens: 4 Thesen. In: Simon, H. (ed.). *Virtueller Campus. Forschung und Entwicklung für neues Lernen und Lehren*. Münster: 1997, p. 131-146.

Behrendt, E. *Multimediale Lernarrangements im Betrieb. Grundlagen zur praktischen Gestaltung neuer Qualifizierungsstrategien*. Bielefeld: 1998.

Berlecon Research *Wachstumsmarkt E-Learning: Anforderungen, Akteure und Perspektiven im deutschen Markt*. Berlin: 2001 Available on the Internet: <http://www.berlecon.de/studien/elearning/index.html>

Bliesener, T. Evaluation betrieblicher Weiterbildung. In: Schwuchow, K.; Gutmann, J. (eds.). *Weiterbildung Jahrbuch 1997*. Düsseldorf: 1997, p. 163-167.

Ehlers, U. *E-Learning: Stand und Perspektiven*. Survey for Verbraucherzentrale Bundesverband e.V., Bielefeld: 2002.

The ability to acquire knowledge via the media, use it creatively and reflect critically on media-imparted communication processes and information is vital for effective media-based learning.

Supporting and promoting **self-directed learning** proficiency continues to be vital. Learners should be equipped to analyse their own **education needs**, formulate **goals** and access and exploit **materials and content** independently. To do this they require a high level of **methodological competence** and the capacity to arrange their own **learning opportunities**. It is not merely a case of empowering learners to solve individual, isolated problems. It also involves comprehensive training in a rapidly changing social and professional world. Otto Peters ⁽³³⁾ emphasised this connection.

'The question of whether we ... advocate self-directed learning is no banality, ... in view of the social and cultural problems we are likely to encounter it is a sheer survival tactic.'

Above all, assuring quality in e-learning also involves assuring learning competence in learners. This enables them to shape high-quality learning processes themselves and to make the most of programme potential within the learning format.

Ehlers, U. et al. (eds.). *E-Learning-Services im Spannungsfeld von Pädagogik, Ökonomie und Technologie. L_-Lebenslanges Lernen im Bildungsnetzwerk der Zukunft*, Bielefeld, 2003.

Ehlers, U. *Qualität beim E-Learning. Empirische Grundlegung und Modellkonzeption einer subjektorientierten Qualitätsentwicklung*. Dissertation, Bielefeld, 2003.

Fend, H. Qualität und Qualitätssicherung im Bildungswesen: Wohlfahrtsstaatliche Modelle und Marktmodelle. *Zeitschrift für Pädagogik No 41*. Supplement (2000): *Qualität und Qualitätssicherung im Bildungsbereich: Schule, Sozialpädagogik, Hochschule*. Published by Helmke, A., Hornstein, W. and Terhart, E.. Weinheim und Basel.

Fischer-Bluhm, K. Qualitätsentwicklung als Antwort auf die Individualisierung im Bildungsbereich – am Beispiel der Hochschulen. *Arbeitsstab Forum Bildung* (ed.): first congress of the Forum Bildung on 14 and 15 July 2000 in Berlin. Bonn: 2000, p. 680-693.

⁽³²⁾ Baacke states that the concept of media competence is based on the concept of communicative competence. He presented this as the Bielefeld media competence model in Baacke, 1997.

⁽³³⁾ Cf. Peters, 1999.



Fricke, R. Zur Effektivität computer- und video-unterstützter Lernprogramme. In: Jäger, R.S. et al. (eds.). *Computerunterstütztes Lernen* (Supplement 2 to *Zeitschrift Empirische Pädagogik*). Landau: 1991, p. 167-204.

Fricke, R. Evaluation von Multimedia. In: Issing, L. J.; Klimsa, P. (eds.). *Information und Lernen mit Multimedia*. Weinheim: 1995, p. 400-413.

Gnahs, D. Zwischenbilanz der Qualitätsdebatte. In: Deutsches Institut für Erwachsenenbildung (DIE) et al. (eds.). *Literatur- und Forschungsreport Weiterbildung June 1999*. Report 43. Topic: Quality. *Wissenschaftliche Halbjahresschrift des DIE. June 1999*. Bielefeld: 1999.

Gräber, W. Kriterien und Verfahren zur Sicherung der Qualität von Lernsoftware in der beruflichen Weiterbildung. Report commissioned by the Federal Institute of Vocational Training. Kiel: 1996.

Harel, I.; Papert, S. (eds.). *Constructivism*. Norwood, New Jersey: 1999.

Harvey, L.; Green, D. Qualität definieren. Fünf unterschiedliche Ansätze. *Zeitschrift für Pädagogik No 41*. Supplement (2000): *Qualität und Qualitätssicherung im Bildungsbereich: Schule, Sozialpädagogik, Hochschule*. Published by Helmke, A., Hornstein, W. and Terhart, E.. Weinheim und Basel

Herzberg, F. *The Motivation To Work*. New York: 1967. Jonassen, D. (ed.). *Handbook of Educational Communications and Technology*. New York: 1996.

Kirkpatrick, D.L. *Evaluating Training Programs. The Four Levels*. San Francisco: 1994.

KPMG: *eLearning zwischen Euphorie und Ernüchterung*. Munich: KPMG: 2001. Available on the Internet: <http://www.kpmg.de/about/press-office/2001/11/28.html>

Meier, A. Qualitätsbeurteilung von Lernsoftware durch Kriterienkataloge. In: Schenkel, P.; Holz, H. (eds.). *Evaluation multimedialer Lernprogramme und Lernkonzepte. Berichte aus der Berufsbildungspraxis*. Nuremberg: 1995.

Müller-Böling, D. Qualitätsmanagement in Hochschulen. In: Lohse, H. (ed.). *6. Deutscher Bibliothekskongress. 84. Deutscher Bibliothekartag in Dortmund 1994: Arbeitsfeld Bibliothek*. Frankfurt/M: 1994, p. 75-83.

Müller-Böling, D. Qualitätssicherung in Hochschulen, Grundlage einer wissenschaftsbasierten Gesell-

schaft. In: Müller-Böling, Detlef (ed.). *Qualitätssicherung in Hochschulen. Forschung, Lehre, Management*. Gütersloh: 1995, p. 27-45.

Pawlowski, J. M. *The European Quality Observatory (EQO): Structuring Quality Approaches for E-Learning, ICALT 2003*, Athens, July 2003.

Peters, O. *Auf dem Weg zum selbstgesteuerten Lernen*. Hagen: 1999. Available on the Internet: <http://www.fernuni-hagen.de/ZIFF/kurslist.htm>

Reeves, T. *A Research Agenda for Interactive Learning in the New Millennium. Proceedings: Ed-Media '99*. Seattle, WA. AACE. Charlottesville, VA: 1999.

Reigeluth, Ch. M. Instructional Design: What Is It and Why Is It? In: Reigeluth, C. M. (Ed.). *Instructional Theories and Models: An Overview of Their Current Status*. Hillsdale, New Jersey: 1983, p. 3-36.

Schenkel, P. Einführung. In: Schenkel, P.; Holz, H. (eds.). *Evaluation multimedialer Lernprogramme und Lernkonzepte. Berichte aus der Berufsbildungspraxis*. Nuremberg: 1995, p. 22.

Schenkel, P. (ed.) *Qualitätsbeurteilung multimedialer Lern- und Informationssysteme. Evaluationsmethoden auf dem Prüfstand*. Nuremberg: 2000.

Sennet, R. *Der flexible Mensch. Die Kultur des neuen Kapitalismus*. Berlin: 1998.

UnicMind. *eLearning und Wissensmanagement in deutschen Großunternehmen*. Göttingen: 2001. Available on the Internet: <http://www.unicmind.de/elearningstudie.pdf>

Wallmüller, E. *Software Qualitätssicherung in der Praxis*. Munich: 1990.

Wilson, B.; Lowry, M. Constructivist Learning on the Web. In: Burge, L. (ed.) *Learning Technologies: Reflective and Strategic Thinking*. Jossey-Bass. San Francisco: 2001. Available on the Internet: http://ceo.cudenver.edu/~brent_Wilson/WebLearning.html

Zimmer, G.; Psaralidis, E. Der Lernerfolg bestimmt die Qualität einer Lernsoftware! Evaluation von Lernerfolg als logische Rekonstruktion von Handlungen. In: Schenkel, P. (ed.) *Qualitätsbeurteilung multimedialer Lern- und Informationssysteme. Evaluationsmethoden auf dem Prüfstand*. Nuremberg: 2000, p. 262-303.