

# QUALITY ASSURANCE BY RQCC: HOW QUALITY IS ATTRIBUTED TO THE RELATION BETWEEN LEARNER AND E-LEARNING ENVIRONMENT

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## Abstract

This article focuses the general question of how to evaluate the quality of on-line courses. It is based on the research findings of the project "Electronic Learning and Assistance Network" (ELAN) which is funded by the European Commission (eTen-programme). In order to answer the initial question, a relational approach to quality assurance of on-line courses is presented, which is based on a *Relational Quality Criteria Catalogue* (RQCC). Following a rigorous learner-oriented approach, quality is considered as an attribute of the relation between course AND learner and not as a substantial attribute of a course itself. Therefore, an on-line course is analysed as a specific e-learning environment which aims at facilitating and promoting learning. In a more general perspective this environment is a space of learning possibilities. This space of possibilities is developed as a space of four learning dimensions: Incentives of learning, learning process, learning support and feedback on learning results.

**Keywords** - Quality assurance, evaluation, e-learning, relational approach, learning environment

## 1 INTRODUCTION

This article focuses the general question of how to evaluate the quality of on-line courses. It is based on the research findings of the project "Electronic Learning and Assistance Network" (ELAN) which is funded by the European Commission (eTen-programme). In order to answer the initial question, a relational approach to quality assurance of on-line courses is presented. Following a rigorous learner-oriented approach, quality is considered as an attribute of the relation between learning environment (e.g. on-line course) AND learner and not as a substantial attribute of a learning environment itself: So, the learner and his characteristics play a decisive role in establishing quality and for this reason the learner is considered as a co-producer of quality [1, 2, 3, 4]. The evaluation of on-line courses in the sense of „product quality“ – e.g. based on technical check-lists – is insufficient [5]. It has to be supplemented by the evaluation of usage and the overall evaluation of the appropriateness of the on-line course in relation to the learner's demands and requirements. Therefore, an on-line course is analysed as a specific environment which facilitates learning. In a more general perspective this environment is a space of learning possibilities.

## 2 LEARNING AS A PROCESS OF 'BILDUNG'

Our relational approach to quality focuses on learning and especially on what is happening during the process of learning. That is why our approach to assure quality includes not only an analysis of the product, which aims to facilitate and promote learning but an analysis of the learner and *his* evaluation of the product which is related to *his* specific learning processes.<sup>1</sup>

'Bildung' as a peculiar German term and concept is related to a specific historical context and can hardly be translated. In the following the concept of 'Bildung' is introduced in a structural way removing all content-related issues as well as specific content-related historical concepts (e.g. Humboldt). These historical concepts are regarded as specifications of this underlying structure. Cleared from content

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1 For a detailed discussion of the relation of 'Bildung' and 'Learning', see [10].

this structural definition of the concept allows to understand and to locate all different positions in the history of German thinking about 'Bildung'.

From a structural point of view 'Bildung' is a process which can be interpreted as change in the triple relational process of education and cultivation. This triple relation of education and cultivation can be described in

1. the *object* dimension (the individual related to the objects in the object world),
2. the *social* dimension (the individual related to the others in the social world)
3. and the dimension of the *self* (the individual related to oneself in his lifetime (past, present and future).

In a formalised way the three dimensions of 'Bildung' are the following:

1. Individual      r      facts              in      object world
2. Individual      r      other people      in      society/community
3. Individual      r      himself            in      his biography

### 3 LEARNING UNDERSTOOD AS A TRIPLE-RELATIONAL PROCESS OF 'BILDUNG'

In this general structure of 'Bildung' the concept of learning can be described as a change of existing relationships [6] in regard to the three dimensions mentioned above. Therefore the learning process of the individual takes place in relation to the dimension of object, social and self. Learning arrangements should always reflect and consider these three relations [10].

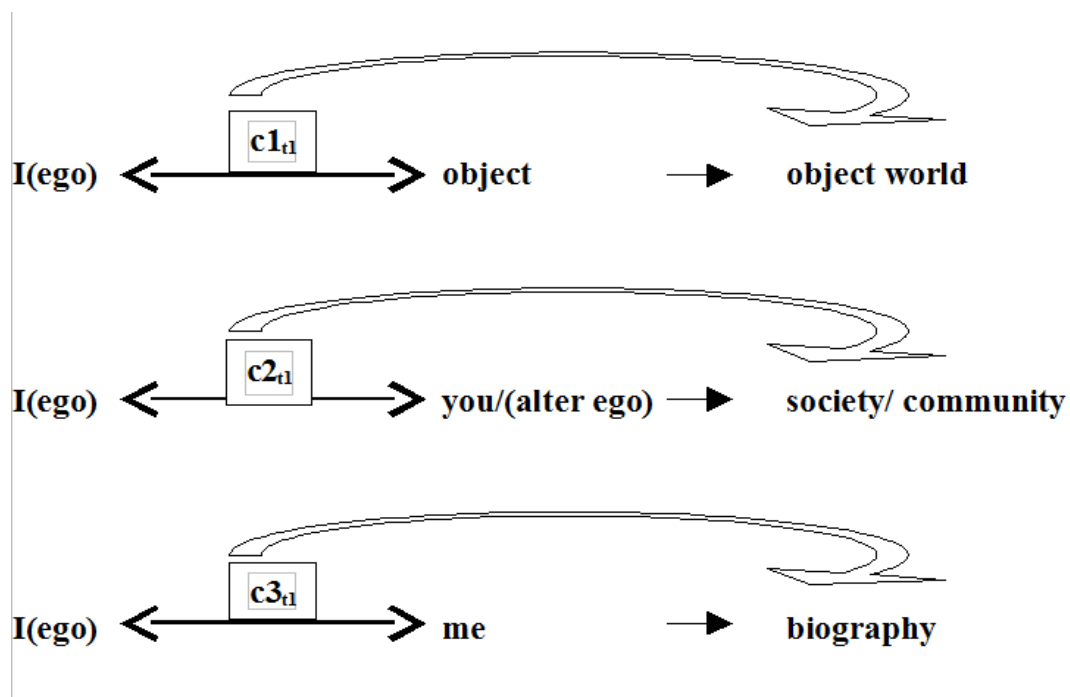


Fig. 1: Triple-relational structure of 'Bildung'

In general from the learners perspective learning refers to the change within these triple relationships. Learning depends on the relation of the learner to facts and matters in this relationship. And this content oriented relation depends on the relation the learner performs with other learners and friends, his family and so on. And the relation to himself, i.e. his self-perception, his learning requirements and his anticipation of his future. Describing learning within the horizon of the structure of 'Bildung' learning arises as a very complex process (Fig. 1) as it additionally refers to the relation of the described relations.

- Learning is a change within the correlation (c1) between the learner (ego) and the objects related to the whole object world, which depends on the possibilities of learning situations and arrangements.
- Learning is a change within the correlation (c2) between the learner (ego) and the others (alter ego) related to the society or community.
- Learning is a change within the correlation (c3) between the learner (ego) and himself related to the whole of his life in the past, presence and future (i.e. in relation to my biography).

#### 4 LEARNING ARRANGEMENT AS 'SPACE OF POSSIBILITIES'

Within our relational approach to quality we define the space of possibilities as the set of concrete arrangements that initializes and promotes changes within the triple-relational structure of 'Bildung'. This space of possibilities is developed as a space of four learning dimensions, which provide the basis for the development of an *Relational Quality Criteria Catalogue* (RQCC) and for quality assurance.

These four dimensions are derived from the process of learning. Like every other process learning is initiated, continues, has critical events and ends with a specific result. An assessment of learning environments without knowing the single individual learner has to proof the general possibilities offered by the learning arrangement. As the pedagogical aspect of learning environments is to facilitate and to promote learning, every learning environment has to tackle the following problems: (1) The process of learning must be initialised and started; (2) the process of learning must be structured and controlled; (3) the learner should be able to fall back on help and support in case he faces a problem while learning which he can not overcome and solve alone and (4) the result of the learning process should be evaluated and reflected (Fig. 2). These dimensions are related to each other and constitute the complex challenge of creating on-line courses and learning environments.

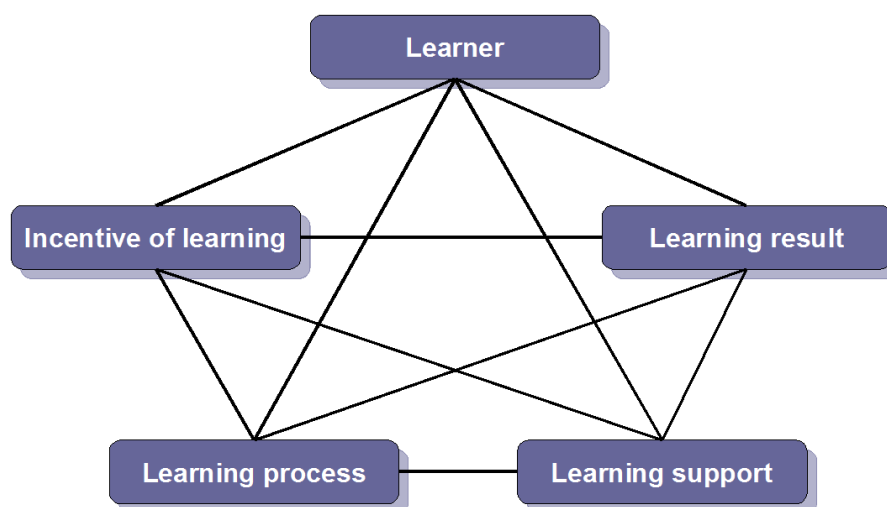


Fig. 2: Dimensions of learning

In the following, these four dimensions will be explained in more detail. Preliminarily it has to be highlighted that the typical learner as the target group of the specific on-line course as defined by the authors is the initial point of quality assurance: How does the author define the typical learner (target group) of his on-line course (for example: age, previous knowledge and skills, learning target; Fig. 3., definition)? This is the crucial reference point of any relation that is evaluated in the process of quality assurance (see below). In general the items to describe the target group are derived from LOM (Learning object meta data, [11]) and supplemented by educational and didactical meta data.

## 4.1 Incentives of learning

When creating an on-line course (as a specific learning environment) didactical professionals have to implement and offer an incentive for starting and continuing learning. The fundamental question of evaluation in this dimension is: Does the on-line course promote and facilitate an appropriate incentive for starting and continuing learning (Fig. 3., description)? The following general possibilities are used as indicators / criteria for quality assurance:

- immediate entry to course content;
- entry to course using outlook in respect of content (i.e. advanced organizer, table of contents);
- entry to course using outlook in respect of methods (i.e. individual / teamwork, media);
- entry to course using an anecdote;
- entry to course using a citation;
- scenario;
- frame story;
- scenic episodes;
- raise an contemporary issue;
- pose a problem;
- using example - counter-example;
- contradiction to common sense;
- contradiction in terms / contradiction as regards content;
- provocation;
- curious, surprising, disturbing, mysterious aspects of content;
- unknown aspects of content;
- alienation of content;
- structural gaps / fragment, incomplete information;
- quiz;
- game;
- test to probe previous knowledge.

This space of possibilities to implement the incentive for learning is used as a check-list for quality assurance. At first it is stated which incentive for learning the author has chosen for the specific course. Then it is evaluated if the authors choice is *appropriate* in relation to the prototypical learner (typical target group), to the implemented learning process, to the implemented learning support and to the implemented feedback on learning result (Fig. 2). The main question is: Could the author have made a better decision / choice within this space of possibilities.

## 4.2 Learning process

When creating an on-line course (as a specific learning environment) didactical professionals have to implement and offer a specific way (or ways) of learning (Fig. 3., description). The fundamental question of evaluation in this dimension is: Does the on-line course promote and facilitate an appropriate process of learning (for example: managing sequences of content)? The following general possibilities are implemented in the *RQCC* concerning the learning process. The following possibilities are used as indicators / criteria for quality assurance:

- From simple to difficult: increasing difficulty;
- from elementary to complex: increasing complexity;
- from concrete to abstract: increasing abstraction;
- from temporal early to temporal late: increasing temporal process (temporal succession);
- from few / little to much / many: increasing quantity;
- from brief / short to long: increasing length;
- from close to distant: increasing distance;
- from constant to irregular: increasing irregularity;

- from detailed to general: increasing generalisation (inductiv / generalising);
- from general to detailed: increasing specification (deductiv / specifying);
- from particular to particular: switch over from one case to similar case (transductive);
- from contradiction to opposition: Is contradiction or opposition used in learning process (dialectic);
- from particular via elementary to general and vice versa: Do the learning process generalises and then goes back to particular case? (hierarchical circular / spiral);
- from outside to inside in a semantic / logic network: Do the learning process surrounds the issue and finally gets to the point? (concentric / restricting).

This space of possibilities to implement the progress of learning is used as a check-list for quality assurance. At first it is stated which process of learning the author has chosen for the specific course (Fig. 3; description). Then it is evaluated if the authors choice is *appropriate* in relation to the prototypical learner (typical target group), to the implemented incentive of learning, to the implemented learning support and to the implemented feedback on learning result (Fig. 2). The main question is: Could the author have made a better decision / choice within the space of possible learning processes?

### 4.3 Learning support

When creating an on-line course (as a specific learning environment) didactical professionals have to implement and offer help and support in case the learner is not able to pass the course, e.g. to master a course- or content-related difficulty by himself (Fig. 2). The fundamental question of evaluation in this dimension is: Does the on-line course supports appropriate help in case the learner is not able to master a learning related problem or difficulty. In general, implemented help can refer to a tutor, the author of the course or co-learners. In every of these cases the space of possibilities offers the following alternatives: synchronous (audio-conference, video-conference, voice-over-ip, etc.) or / and asynchronous (mail, forum, wiki, blog, annotation, etc.). In addition learning support can be offered in the following ways:

- FAQ (frequently asked questions);
- manual (text);
- manual (video);
- implemented on-line help system;
- lexicon;
- thesaurus;
- prompt-by-example;
- reiteration (i.e. of learning history / replay of learning process);
- annotation of former course participants;
- reference to actions of other learners in same situation (see *social navigation*).

The indicators / criteria above are only part of the space of possibilities that must be considered in this dimension. The full space is a set of about 40 items or elements.

This space of possibilities to promote and facilitate the progress of learning by given problems or critical events are used as a check-list. At first it is stated which kind of support and help the author has implemented in the specific course (Fig. 3; description). Then it is evaluated if the authors choice is *appropriate* in relation to the prototypical learner (typical target group), to the implemented incentive of learning, to the learning process and to the implemented feedback on learning result (Fig. 2). The main question is: Could the author have made a better decision / choice within the space of possible learning support?

### 4.4 Feedback on learning results:

When creating an on-line course (as a specific learning environment) didactical professionals have to implement and offer ways to inform the learner about his learning outcome (Fig. 2). The fundamental question of evaluation in this dimension is: Does the on-line course support appropriate feedback to

the learner about his learning result? The following indicators / criteria are only part of the space of possibilities which consist of about 40 alternatives:

- Dichotomous feedback (passed / failed);
- gradual feedback (scale, for example school grades);
- score in relation to maximum total possible points;
- score in relation to scores of co-learners;
- ranking („high score“, „top ten“);
- symbols (for example smiley);
- learning state in comparison to defined learning target;
- learning state in comparison to co-learners;
- feedback when defined learning target is reached;
- feedback to learning time in comparison to defined learning time;
- feedback to so far not visited section of content;
- feedback to individual course of action;
- variable feedback, on inquiry of the learner;
- automatic feedback at the end of the course;
- repeatedly during the course;
- repeatedly at the end of each session;
- repeatedly when continuing an (interrupted) session.

This space of possibilities to implement feedback on the result of learning is used as a check-list for quality assurance. At first it is stated which forms of feedback the author has implemented in his course (Fig. 3; description). Then it is evaluated if the authors choice is *appropriate* in relation to the prototypical learner (typical target group), to the implemented incentive of learning, to the implemented learning process and to the implemented learning support (Fig. 2). The main question is: Could the author have made a better decision / choice within the space of feedback on learning result?

For an assessment of quality it is necessary to develop a indicator / criteria catalogue of each of the four learning spaces respectively learning arrangements as spaces of alternatives. Against this “check-lists” the didactical quality of the course is evaluated, in reference to the implemented choices of the author within the described spaces of possibilities.

The evaluation of quality is conducted by didactical experts in a peer review process. However the final judgement of the learning arrangement (i.e. the on-line course) as appropriate or not-appropriate depends on the individual relation of the empirical learner to the learning arrangement. Therefore a comprehensive quality management in the area of education has to integrate the user’s opinion and feedback (judgement) concerning the quality of the four learning arrangements (see Iske / Meder in this volume). In general, every single learner has to answer the following questions:

1. Is the learning arrangement appropriate to my learning preconditions (i.e. previous knowledge, existing learning skills)?
2. Does it motivate me to start and continue my learning process?
3. Is the learning arrangement appropriate to my preferred learning process?
4. Does the learning arrangement offer support concerning my specific learning problems?
5. Does the learning arrangement offer feedback concerning my learning results?

## **5 STEPS OF APPLYING THE RELATIONAL QUALITY CRITERIA CATALOGUE (RQCC)**

In this chapter the structure of the *Relational Quality Criteria Catalogue* is described in more detail. At the same time this structure provide steps of applying the RQCC.

As mentioned in the last chapter the first step of applying the RQCC is the identification of the typical target group of an on-line course as defined by the author (Fig 3.; definition). The description of the typical target group is part of the course description (meta data) within the e-learning portal of the ELAN project.

The second step refers to the question, which specific possibilities the author has chosen to create the course (see 4.1 to 4.4). These chosen possibilities are analysed in terms of the typical target group, the incentives of learning, the learning process, the learning support and the feedback on the learning result.

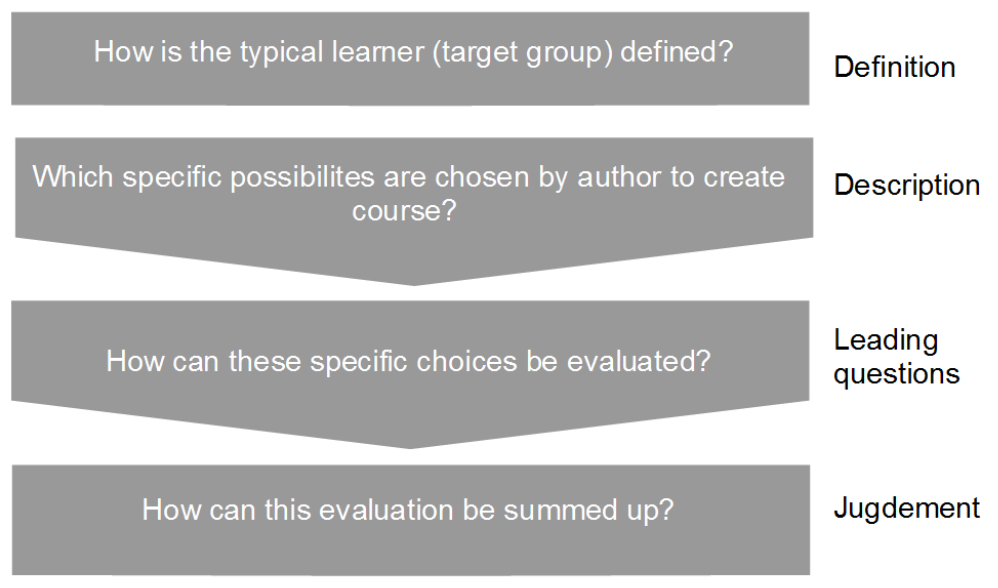


Fig. 3: Steps of applying the Relational Quality Criteria Catalogue (RQCC)

The third step refers to the question, how the described chosen possibilities can be evaluated. This evaluation is a precondition for a final judgement of appropriateness. It is based on leading questions, which aim at facilitating a final judgement. The RQCC contains about 70 questions to support the process of evaluators to come to a professional judgement. The following example exemplifies some of the leading questions concerning the incentive of learning are the following:

- How do you evaluate the dramaturgy (tension) of the course?
- How do you evaluate the variability of the didactic process (didactic dramaturgy)?
- How do you evaluate the intenseness of dramaturgic control (control of didactic process)?
- How do you evaluate the consistency (conclusiveness) of dramaturgy of the course?
- How do you evaluate the quality of medial representation of the course content?
- How do you evaluate the harmonisation (synchronisation) of employed media?
- How do you evaluate the application of multimedia?

The fourth step refers to the question, how the evaluation of the specific choices (3) can be summed up to a general judgement on the appropriateness of the quality of the specific course. This final judgement is based on the evaluation of the appropriateness within the dimensions of learning (Fig. 2). Figure 4 illustrates the summing up questions for the evaluation of the incentives of learning.

In general the analysis of learning arrangements as 'space of possibilities' is composed of a *formal* analysis (description) and a *relational* judgement (appropriateness). Both analysis and judgement are based on expert evaluation. The formal analysis concerns the description of the structure and the overall features of the learning arrangement concerning the target learner group and is conducted by expert review. The relational analysis is based on the rating (estimation) of an expert concerning the appropriateness of the 4-dimensional choices made by the author in the spaces of possibilities.





We presented a Relational Quality Criteria Catalogue (RQCC) which describes and evaluates the space of learning possibilities and which exemplifies our strictly learner-oriented approach in accordance with the concept of e-learning as self-regulated learning. The fundamental dimensions of the RQCC are: typical target group, incentives of learning, learning process, learning support and feedback on learning result. Based on these dimensions, we exemplified how quality is attributed to the relation between learner and on-line course (as a specific learning arrangement). The process of quality assurance of on-line courses is described as steps of definition, description, leading questions and final judgement. This judgement of quality refers to the appropriateness of the evaluated course in the face of these fundamental dimensions. The presented relational approach establishes fundamental categories for evaluation of e-learning quality. Focussing on the relational character of quality it presents an innovative and so far neglected approach in the field of e-learning.

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