Quality Management of Peer Production

Quality Management Handbook

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I Foreword - About the QMPP project

QMPP (Quality Management of Peer Production of eLearning) is a joint European project funded by the European Commission under the Leonardo da Vinci programme. The overall aim of the project was to accelerate the creation of peer-produced eLearning content by providing a methodology and a process to manage its quality. This overall aim also supports the empowerment of eLearners in vocational education and training in their development from passive receivers of eLearning content towards active producers of content of their specific knowledge areas.

Peer production of eLearning content is a growing trend, which will play an elementary role in creating, validating, enriching, editing, and updating of digital learning content. Thus it is important to pay growing attention to the management and support of peer production in eLearning, which will also enable new learning material production and updating work methods.

The specific aim of the project was to develop a solid approach and methodology on how to organise and support the quality management process of peer-produced eLearning content – this Handbook is guiding the users to design, create and implement their own quality management processes to support the peer production of eLearning in their organizations.[1]

The QMPP project itself did not take a position on the eLearning tools (such as eLearning platforms or Learning Management Systems) used, but aimed to develop and implement a systematic process for the quality management of peer-produced eLearning content.

A critical part of the project were the real life pilots. These piloting experiences were an important element in the authoring of the Handbook. Additionally, other participatory working methods were used during the QMPP project– such as expert panels in various European countries in planning and validating the work.

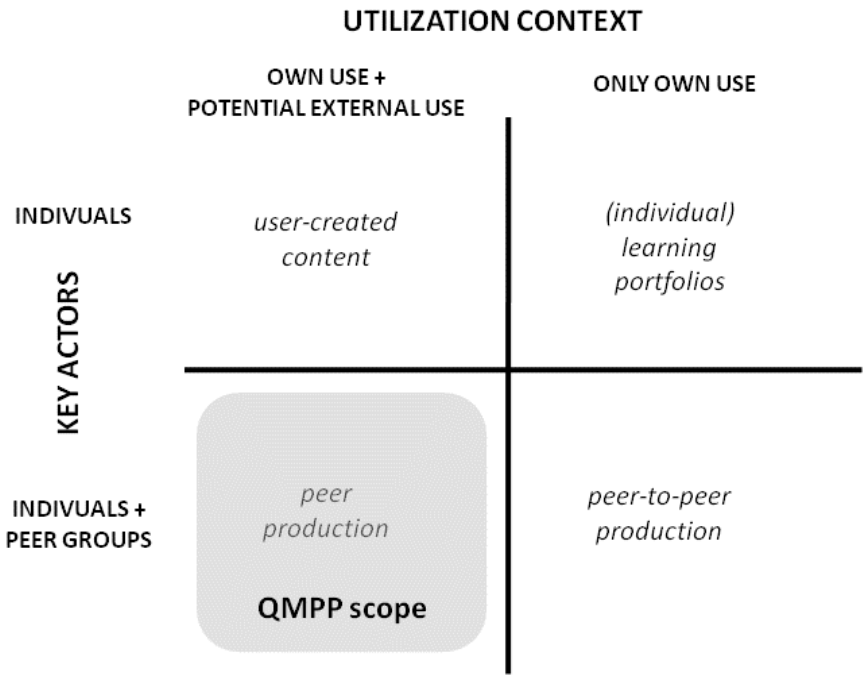
As a European project, the QMPP had an active and versatile European partnership. The partnership consisted of the following partners:
HCI Productions Oy (Finland) *contractor of the project*
Scienter (Italy) *coordinator of the project*
European Foundation of Quality in eLearning (EFQUEL) (Belgium)
Finnish eLearning Centre (Finland)
IAVANTE Foundation (Spain)
Institute for Innovation in Learning (FIM NewLearning), Friedrich-Alexander-University Erlangen-Nuremberg (Germany)
Scienter Espana (Spain)
University of Macerata (Italy).

[1] we are using throughout the Handbook the term ”organization” as a general term to describe educational institutions, companies and various other entities

Peer production is – as we will explore in this Handbook – a wide phenomenon. We have limited the scope of this project in order to cover in more detail the selected area of peer production.

We wanted to concentrate on the organizational level / institutional level and provide practical tools primarily for the quality management of process peer production of eLearning in vocational education institutions and vocational training institutions. However, we feel also that most – if not all – of our work can also be applied by other educational institutions and also within the field of corporate training.

We made also the choice to emphasize in peer production the importance of the peer group in the various phases of the learning provision. According to our reading of the literature, the peer produced (or if you like: the user-created content) is mainly describing the digital artefacts produced by various individuals, as in our approach the communicative element is essential – and it takes often place by the strong involvement of the peer group. Thus according to the different terms and their use we can summarize our emphasis according to the following picture (see *picture 1*).



Picture 1: Focus of the QMPP work

This Handbook is a result of joint work within the QMPP project. However, the Handbook was mainly authored and edited by two main authors, namely Mr. Ari-Matti Auvinen (Senior Partner, HCI Productions Oy) and Dr. Ulf-Daniel Ehlers (Vice President, EFQUEL).

In addition to the co-authors, several active members of the QMPP project consortium have contributed to the development of the Handbook in various roles. The authors would like to thank all project partners, and in particular the following persons:

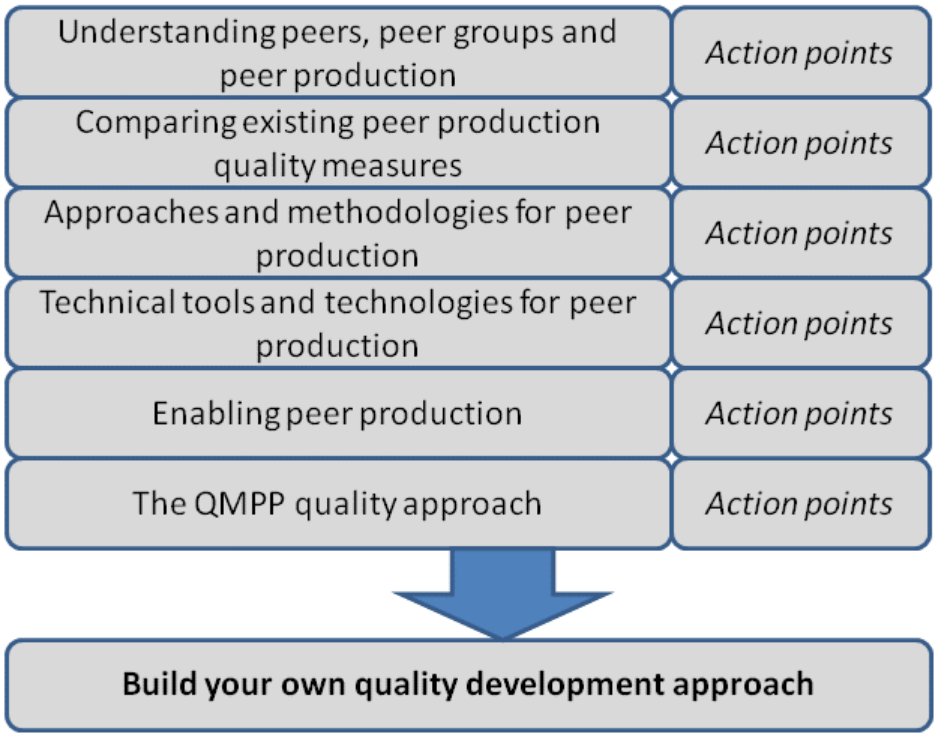
- Ms. Kaisa Honkonen-Ratinen and Ms. Kristiina Jokelainen (HCI Productions Oy)
- Mr. Tim McQuaid, Mr. Jose Pinzon and Mr. David Riley (IAVANTE)
- Mr. Thomas Fischer, Mr. Thomas Kretschmer and Dr. Walter Kugemann (FIM Neues Lernen)
- Ms. Michela Moretti (Scienter Italy)
- Ms. Laura Fedeli (University of Macerata).

II Purpose and target audiences of the QMPP Handbook

The objective of this QMPP Handbook is to serve as a **practical guide** in the creation and implementation of quality measures for peer production in eLearning. The QMPP Handbook is written with a very pragmatic approach, and thus the key intention is to provide guidance and assistance for the practical daily work.

The QMPP Handbook is authored as a practical guide on quality management of peer production in eLearning, and it links the theoretical concepts and latest research outcomes with practical decisions and actions to be undertaken. Although firmly based on concurrent research and literature, the QMPP Handbook serves also users not familiar with quality management concepts. We have included to the Handbook also a wide selection of recommended readings, which cover thoroughly the field of peer production in eLearning.

The **structure** of the Handbook is based on the combination of theoretical and experimental knowledge of peer production in eLearning and practical application of this knowledge to individual organizations. The aim is to create wit a step-by-step approach the own quality development approach for the users. The structure of the Handbook is visualized below.



The “action points” in the Handbook are not meant only for reflection for the users, but they also build the necessary basis for the building of the own quality development approach for the users.

The **target audiences** of the QMPP Handbook include all trainers and educators working with peer-produced eLearning content. Many of the case studies are linked with vocational education and training, and thus the QMPP Handbook can be of special interest to educators and trainers working with vocational education and training as well as corporate training. However, we expect also that educators from primary education to higher education find the Handbook useful in their work.

In addition to the Handbook, the QMPP project will also more content through its website. On the website you can find also additional electronic resources – you find the QMPP website at
http://www.qmpp.net

III Definitions in Quality Assurance

The following definitions are commonly accepted and should be a useful point of reference throughout the Handbook.

QUALITY ASSURANCE
The means by which an institution can guarantee with confidence and certainty, that the standards and quality of its educational provision are being maintained and enhanced.

QUALITY CONTROL
Quality control refers to the verification procedures (both formal and informal) used by institutions in order to monitor quality and standards to a satisfactory standard and as intended.

QUALITY ENHANCEMENT
Quality Enhancement is the process of positively changing activities in order to provide for a continuous improvement in the quality of institutional provision.

QUALITY ASSESSMENT
Quality Assessment is the process of external evaluation undertaken by an external body of the quality of educational provisions in institutions, in particular the quality of the student experience.

QUALITY AUDIT
Quality Audit is the process of examining institutional procedures for assuring quality and standards and whether the arrangements are implemented effectively and achieve stated objectives. The underlying purpose of Continuation Audit is "to establish the extent to which institutions are discharging effectively their responsibilities for the standards of awards granted in their name and for the quality of education provided to enable students to attain standards."

STANDARDS
Standards describe levels of attainment against which performance may be measured. Attainment of a standard usually implies a measure of fitness for a defined purpose.

QUALITY CULTURE
Quality Culture is the creation of a high level of internal institutional quality assessment mechanisms and the ongoing implementation of the results. Quality Culture can be seen as the ability of the institution, program etc to develop quality assurance implicitly in the day to day work of the institution and marks a move away from periodic assessment to ingrained quality assurance.

ACCREDITATION
Accreditation is the result of a review of an education program or institution following certain quality standards agreed on beforehand. It's a kind of recognition that a program or institution fulfils certain standards.

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1 Introduction

Peer production can be defined to include the digital content created, edited, enriched by peers, in other words by people on the "same hierarchical level". The contemporary examples in the Internet of peer produced digital content include e.g. YouTube[2], Facebook[3], blogs, flickr[4], slashdot.org[5] etc.

The various dictionaries define the term "peer" as follows:
"a person of equal social standing, rank, age, etc."[6]
"a person of the same rank or standing; a legal equal; a person who is equal to another in abilities, qualifications, etc."[7]

Often with the term "peer" is also linked the term "peer group", which is defined as follows:
"a social group composed of people of similar age and status"[8]
"a peer group is a group of approximately the same age, social status, and interests; generally, people are relatively equal in terms of power when they interact with peers"[9].

In the context of involving peers to the educational process, some use also the term "peer-to-peer education". Peer-to-peer is often linked in the technical sense with the "peer-to-peer networks", which describe mainly the technical linking of several computers with another as equals. Some authors claim also that the concept of peer-to-peer networks is increasingly evolving to an expanded usage as the relational dynamic active in distributed networks - not just computer to computer, but human to human. Thus e.g. Yochai Benkler claims that associated with peer production are the concepts of peer governance and peer property in the digital world.[10]

Quality development for education and eLearning, which means evaluating learning contents and processes, certifying and accrediting programs and institutions, is becoming more and more important. *Quality management* means defining comprehensive organizational processes within an educational institution and agree on indicators for their goodness. *Quality assurance* examines whether a promised level of quality can actually be kept. *Quality control* is supposed to detect mistakes and prevent them. What, however, happens in learning scenarios in which eLearning 2.0 is involved? In cases in which learning material is not fixed beforehand, learning processes are highly diverse and not unified and learners find their own way of learning? And what about those education processes which happen outside of the programs and

[2] see http://www.youtube.com
[3] see http://www.facebook.com
[4] see http://www.flickr.com
[5] see http://slashdot.org
[6] see http://www.thefreedictionary.com/peer+ (read 16 July 2008)
[7] see Webster's Encyclopedic Unabridged Dictionary of the English Language, Random House 1989
[8] see http://www.thefreedictionary.com/peer+group (read 16 July 2008)
[9] see http://en.wikipedia.org/wiki/Peer_group (read 16 July 2008)
[10] see Benkler 2006

formal educational institutions? Who determines the quality of such learning scenarios, what can then be assessed at all and which methods can be used to improve quality?

In this handbook we will outline resource, methods, actors and processes to support the quality development and evaluation in peer-production scenarios.

Action point

You have probably used some digital content provided by Web 2.0 applications – such as YouTube, Wikipedia or Flickr. Reflect in the following your understanding HOW quality assurance works in these "social software" applications (reason , based on your practical experience, how their quality assurance works) and WHAT kind of a quality management approach they promote (reason, based on your practical experience, what type of quality management approach they promote)?

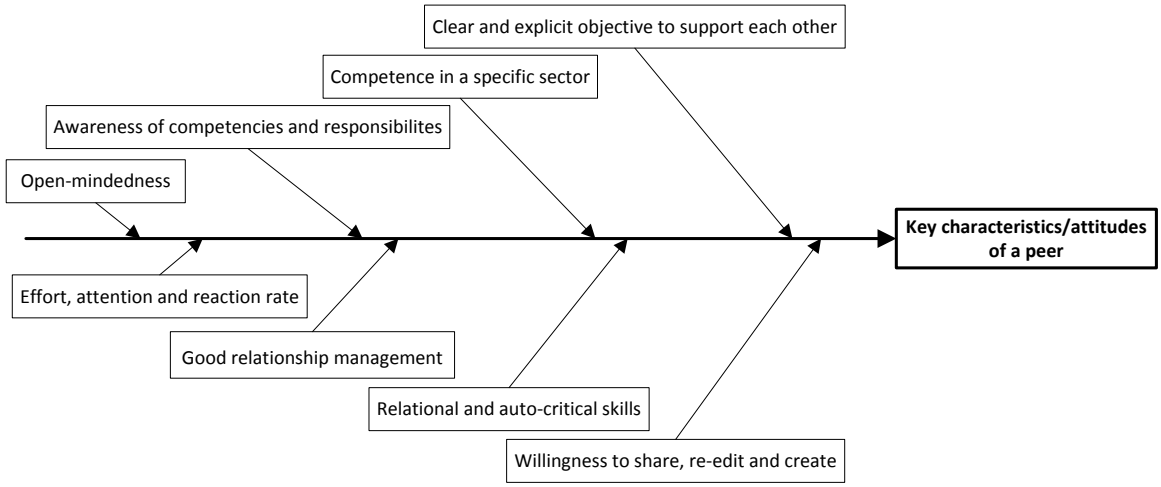
2 Peers, peer groups, peer production, and quality of peer production

This chapter of the handbook assists the users with the key definitions of peers, peer groups, peer production and quality of peer production. The basis for this chapter has been developed by the expert panels of the QMPP project held in different European countries.[11]

2.1 What is a peer?

What are the key characteristics of a peer? We described previously that a peer is "a person of equal social standing, rank, age, etc." However, for our purposes this might be a too generic definition. We should deepen this understanding of a peer in our context of peer production and define some characteristics of a peer and his/her attitudes. Thus our expert panels defined a peer's characteristics in particular regarding a peer's attitude as follows:
As a part of a community a peer is or should be open-minded, perceptive and aware of his competencies and responsibilities in terms of effort, attention and reaction rate. In this context peers are expected to possess strong relational and auto-critical skills, exhibit good relationship management and a deep subject matter competence in a specific sector of knowledge.

The characteristics of a peer can be visualized as follows (see *picture 2)*:



Picture 2: Key characteristics/attitudes of a peer

[11] see in more detail: Fischer, T. and Kretschmer, T: Benchmarking Peer Production Mechanisms, Processes & Practices. Deliverable of WP3 of the QMPP project, 2008.

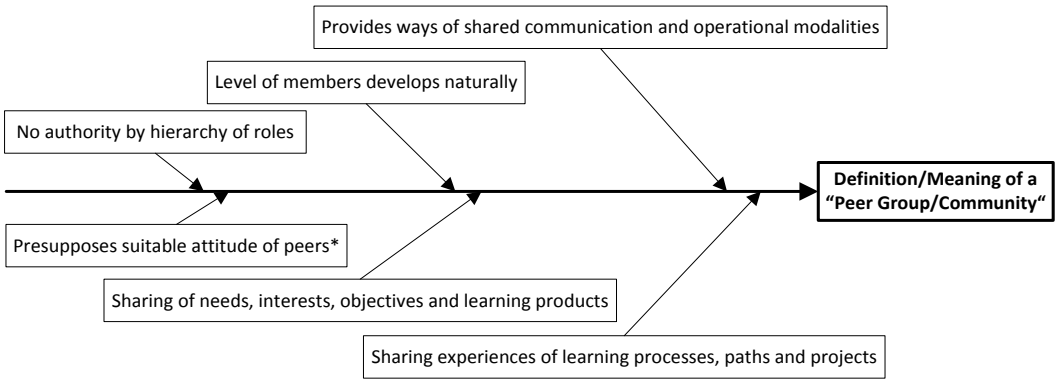
2.2 What is a peer group or peer community?

A peer group is the group of peers relating to a single person or group. First of all it is agreed on the fact that due to the multitude and diversity of peer groups and communities it is virtually impossible to determine concrete characteristics which hold true for all sorts of peer groups. According to this circumstance the following general characteristics of a peer group were specified in order to determine an abstract definition.

Peer group members are willing to share materials, re-edit existing ones and create knowledge and they have a clear and explicit objective to support each other in order to grow together. Authority within the group is very seldom based on a hierarchy of roles. Rather than that, in most communities a level of members develops naturally and in accordance with the degree of participation, quality of contributions and the confidence acquired from experience and competencies.

Furthermore openness and recognizing and exploiting ways of shared communication and operational modalities are considered to be essential for a peer group to prosper. This becomes even more evident in face of the understanding that sharing should not be limited to the exchange of learning products but also explicitly address the sharing of experiences concerning learning processes, paths and projects.

The characteristics of a peer group or a peer community can be visualized as follows (see *picture 3)*:



Picture 3: Definition and meaning of a peer group or peer community

2.3 What is peer production?

We start with assessing with the given definition of peer production *"The digital content for learning created, edited, enriched by peers, in other words by people on the same hierarchical level"* The definition can be regarded to be adequate for "learners" peer production". For "teachers" peer production" however the limitation to digital content is considered to be inappropriate and too restrictive. Extending the concept to "the structure (project) of educational modules and/or whole courses, or at least to the path proposed to the learner" is therefore highly recommended. The expression "hierarchical level" however is deemed to induce the misleading idea that it only refers to individuals of the same organisation. And thus to conclude: it is perceived to be important to explicitly highlight the fact that collaboration very often occurs cross-organisational and in the corporate sense can even reach across different companies or suppliers.

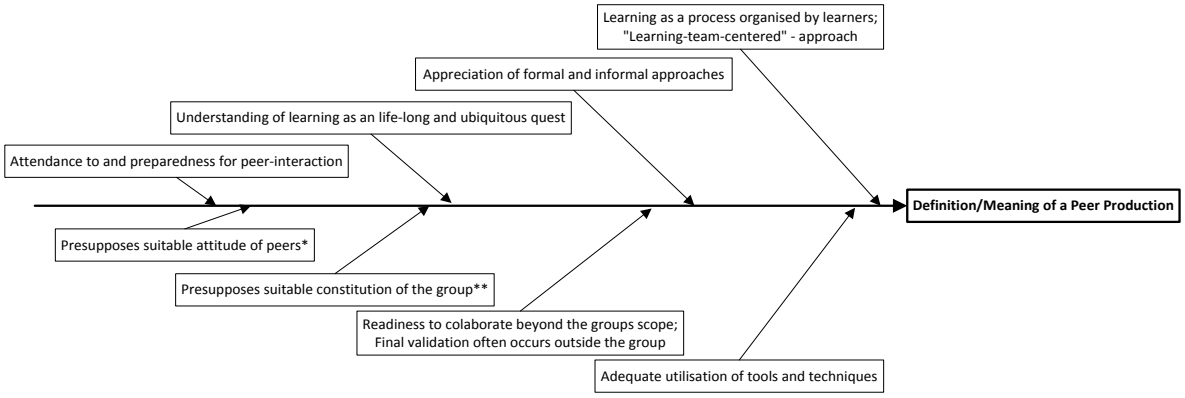
In addition another field which has been given importance in the expert statements is learning by peer-interaction. These learning approaches can be summarised by means of the term "Learning 2.0" approach. It describes a number of developments, trends and points of view, which require change from teaching to learning. According to the discussions in the expert panels, the new point of view essentially connects eLearning with five characteristics:

1. Learning takes places always and everywhere (ubiquitous) and therefore in many different contexts, not only in the classroom.
2. Learners take on the role of organizers.
3. Learning is a life-long process, has many episodes and is not (only) linked to educational institutions.
4. Learning takes place in communities of learning (so called communities of practice, see e.g. Wenger 1999): Learners participate in formal, as well as informal communities.
5. Learning is informal and non-formal and takes place at home, at the work place and during leisure time and is no longer centred on teachers or institutions.

"ELearning 2.0" means using social software and learning services, which can be combined according to individual needs. The word „can", is very significant in this context as technology alone does never determine its use.

According to the expert panels the most significant characteristics of peer production are recognizing the value and necessity of complex processes within peer production, such as creation, sharing and editing and the readiness to be open and receptive towards inputs from different individuals, fields and directions. Besides that it is agreed on the fact that sharing the same fields of interest and objectives is a prerequisite.

The characteristics of peer production can be visualized as follows (see *picture 4)*:



Picture 4: Definition and meaning of peer production

In conclusion the understanding of peer production builds on the key characteristics/attitudes of a peer and the definition and preconditions of peer groups and communities.

Action point

You have now been acquainted with the views of the European expert panels on peers, peer groups and peer production. Reflect on the following – based on your own experience – these definitions. How would you supplement these definitions? Are there some characteristics in your organization that these definitions are not covering? Who is your direct peer? Who are forming your peer group?

3 Comparing Existing Peer Production Quality Measures

This chapter of the handbook guides users through the different contexts in which peer-production can take place, ranging from educational learning scenarios to production scenarios for content.

> *"Download a lecture off the seminar web page as a pod cast in the morning, take part in an online session of an international studying group for the purpose of preparing for an exam in the afternoon and log into the virtual world of Second Life to take part in a tutorial relating to the morning's lecture – the daily routine of studying looks like this or similar more and more often. In companies, online trainings are no longer visions of a distant future, but reality for more and more employees" (Ehlers 2008).*[12]

Teaching and learning is changing. If peer production is an inspiring method in the joint knowledge creation and knowledge refinement, it also has a lot of potential in the area of education and training. It is about the use of online tools such as blogs, wikis or pod casts for learning and teaching, and for joint knowledge creation. Learners can create their own contents and exchange information in networks like the video platform YouTube (http://www.youtube.com). Stephen Downes, who coined the term „eLearning 2.0", describes it with words such as "learner centered", "immersive learning", "connected learning", "game-based learning", "workflow (informal) learning", "mobile learning". On top of that, he sees a development from standardized learning environments to „personal learning environments".[13]

But what is really meant by that? What constitutes the new, innovative element that is described by Web 2.0 and eLearning 2.0? Peer-Production? And above all: Will this development have consequences for quality assurance, management and development in eLearning? And if so: Do we need new methods and concepts to improve and assure the quality of eLearning 2.0.

[12] the introduction to this chapter is based on Ehlers 2008
[13] see in more detail Downes 2007

In the following section we present several case studies of various practices where knowledge is peer-produced and learning shifts from a reception "1.0" mode to a participative "2.0" mode.

Case I: The Finnish Tax Academy[14]

The Finnish Tax Academy is in charge of the learning activities within the Finnish Tax Administration. The challenges in the work of the employees within the Tax Administration include, among others, the following: i) quickly changing regulatory environment (and thus permanent need for updates and maintenance), ii) expertise in taxation issues really is within the Tax Administration operational staff (and thus restricted potential to utilize external expertise).

The Finnish Tax Academy has been an active user of eLearning since the year 2000 – in 2007 approx. 1300 employees studied at least on one eLearning course (more than 20 % of the workforce). The key of the eLearning approach is that all the eLearning courses are produced by the Tax Administration staff and experts; within the staff of approx. 6000 persons, there are more than 100 trained eLearning content providers and 110 eLearning tutors.

Authoring eLearning courses provides an important potential to enrichen the work of many experts by adding the learning provision task to their work. This is enabled by a clear workload assignment and thus eLearning content creation is an elementary part of the expert's work; for instance, an expert can use 32 person-days per course unit (20 learner hours) of allocated workload. It is also important that instead of compensating separately for the learning material provision, it is seen (in the spirit of a learning organization) as an organic part of everyday work.

The peer producers of eLearning content have been specially trained by an intensive training program, which has been organized by an external university entity. It consists of eight face-to-face training days as well as of own web-based courses and own web-based platform for communication, discussion and reflection.

The process of eLearning course content authoring has been jointly defined to include the following steps:

- first edition
- peer reviews – "cross auditing"
- revised edition
- piloting with a limited audience (including structured feedback collection)
- final version

Operational and pedagogic support is provided both by the own Tax Academy team as well as by external actors (universities, polytechnics, consultants).

As a result of this work, the Tax Administration regards eLearning as an elementary part of their learning, the Tax Academy produces or reviews more than 20 eLearning courses annually (in all they have more than 60 courses on offer) and they also provide their eLearning courses to all Tax Administration employees with a free access also for self-studying.

[14] this case study is authored by Ari-Matti Auvinen (HCI Productions Oy) based on the first hand personal experiences in working with the Finnish Tax Academy, see also the Annual Report of the Finnish Tax Administration at http://www.vero.fi/nc/doc/download.asp?id=6169;1863506 (read on 18 July 2008)

Case study II: Eureka at Xerox[15]

Eureka project was started within the Xerox company in 1994. The challenge for Xerox was to create a working mechanism to collect and distribute technical and maintenance information for the front-line people. This was based to the notion, that within the Xerox company the majority of technical knowledge was "inside the heads of the field people" – in other words not in well-structured databases or documents.

The principal idea in the Eureka project was to support the field engineers and technicians to share in their Xerox community maintenance advice, tips and "good practices". In addition, Xerox faced two important challenges, which were the following:

- the maintenance manuals were outdated quickly and the printed versions were soon out-of-date and difficult to maintain in an accurate condition
- the maintenance manuals did not include many innovative front-line work methods or practices, but they documented rather clinically a "clinical" work practice.

The experiences Xerox collected of its front-line co-workers showed that, in addition to the official technical documentation – and in many cases instead of the official technical documentation – the front-line people used their own notepads, selected only certain important pages of the manuals and wrote their own procedural notes. A part of the unofficial practices was the "peer copying" (or if you like: xeroxing) and "peer distribution" of the self-made and self-summarized technical documents.

Within the Eureka project a simple-to-use database was constructed and every front-line person could contribute to that database and save his/her own experiences. The basis structure for the input was the following:

- product/component/part
- experienced problem
- proposed solution
- chain of messages (tree metaphor of messages – e.g. a new message, answer, comment etc.)
- author
- validator.

The database could be accessed also through a search engine, which was either a drop-down menu or free text search. The tools developed within the Eureka project included also a peer review tool (close to what e.g. Amazon uses today in peer rating of their books), by which the users could assess the usability and validity of each input. It was also important for the company, that the Eureka documents were routed to the R&D entities, which could thus receive direct, real, and timely feedback from the front-line.

Eureka provided its users also with small guides (hint books) covering the following subjects:

- authoring – what to cover, how to describe the problem and solution etc.
- validation – how to validate, what aspects to consider, what references to use etc.
- sharing – how to share my knowledge, what are the key benefits of sharing etc.
- utilization – how to use, what are the limitations of using Eureka etc.

[15] sources for this case study included, among others, Ahmed, P.K. – Kok, L.K. – Loh, A.Y.E.: Learning through knowledge management. Butterworth Heinemann 2002 and Brown J.S. - Duguid P.: Balancing act: How to capture knowledge without killing it. Harvard Business Review 78 (3) (2000), 73-80

Although the reward system of producing content to Eureka was one critical aspect to consider, in some countries the front-line co-workers spoke against monetary rewards of information to be saved into Eureka, as they claimed it might corrupt the quality of the content, would it only be provided triggered by monetary rewards.

As a summary one can state that by using the Eureka Xerox increased its confidence to their own front-line organization, their problem-solving skills and their continuous innovativeness. In addition, Xerox claims that according to its own calculations, it has saved 100 million USD (by the year 2000) in various stages of its operations by using the Eureka approach.

Case study III: Bank of innovative practices at the IAVANTE foundation[16]

Bank of Innovative Practices (BPI) has been developed by IAVANTE foundation for the Ministry of Health in the Andalucian Regional Government. It is a platform with the aim of fostering and improving innovation and diffusion in the Andalucian health sector, by means of identification of innovative actions which will be carried out in itself and its diffusion to the rest of the system, so that they can act from pilot or exemplary experiences to the rest of the System. Each innovative practice or innovative idea is developed by a peer professional group from the system.

BPI allows the registration as participant, which offers the following alternatives that can ease peer production:

- to inform and to be informed about the innovative practices which are being developed in the Andalucian Public Health System
- to create collaborative working spaces for the development of innovative practices between professionals of different organizations (belonging to the Ministry of Health for the Andalucian Regional Government)
- to communicate with other professionals or working parties with similar problems
- to value and to give one's opinion about innovative practices which are being developed, as well as to contribute with ideas and suggestions.

The BPI provides its participants with a set of collaborative tools that allow for the peer production of content. Project teams have at their disposal a common space where they can share documents, post links, comments and calendar events. In addition to that, there are other site-wide tools available such as a tagging system for all content and a voting system. Comments by users are allowed for every content item in the site. Users can choose the configuration of their public profile.

The registration in innovative practices which have recognition as such after the evaluation by BPI, entitles members of the team responsible for them to get a certificate. Moreover, BPI prizes are offered, pursuing the recognition of professionals' task and the repetition of those initiatives that are more innovative.

For each innovative practice (a project) or innovative idea (a proposal), there is a set of parameters analyzed by the Bank's Steering Committee. Projects are evaluated on aspects such as efficiency, effectiveness, level of innovation, gender equality, and adequacy with wider health policies. For the ideas or proposals, innovation potential, feasibility and potential impact are assessed.

[16] this case study has been authored by Jose Pinzon (IAVANTE)

Case study IV: KONE Elevators and peer-produced technical training[17]

The model of ”workplace-centered learning material production” has been implemented in various organizations – among others, the Alcan aluminum factory in Kurra Kurra (Australia) documented their approach in a sound and condensed manner. In a pilot project in KONE Elevators (the large Finnish elevator company) Australia, new models to create front-line maintenance information by the front-line people themselves were piloted.

The important basic notion was that in developing maintenance instructions and manuals for the front-line, the quality of the content can be improved by using as an author an experienced supervisor than a documentation expert or a trainer. This was simply due to the fact that the experienced supervisor knew and could govern the variety of existing front-line documentation, and thus avoid double or triple amount of work in creating the documents (thus e.g. in an maintenance documentation the general process of a maintenance operation was only described once, if it was different from the ordinary maintenance operation; if it was similar to the ordinary maintenance operation, there was just a link created to the conventional procedure). Another key element was that this method also condensed the front-line documentation, as it was concentrating on the essentials and thus it was also shorter than the “just-in-case documentation”.

The key component of this model was thus the utilization of the supervisors in both content creation as well as content validation. They were supported by a number of critical tools (such as resource guides). The experience in the project showed, however, that the supervisors could more accurately than the documentation unit of the HQ identify the key essential guide lines and shortcuts – and thus they could also avoid unnecessary work phases and authoring of unnecessary (or overlapping) documents.

The results showed also that the front-line initiated technical documentation was by far cheaper in its global costs (authoring, translation, printing, distribution) than centrally created documentation was. However, the basis of the meaningful work load in the front-line and thus the cost savings is the appropriate division-of-labor: the various planning documentation (e.g. CAD pictures etc.) must be done centrally, but the front-line experts are far more efficient in summarizing the created knowledge to field-friendly documentation and can effectively link the new documents to the existing mass of documents.

However, the most important result in summarizing the content to the most critical one and to have people from the actual front-line organization to develop these materials, is the economy of labor in daily work situations. As often noted, engineers seek to learn what is needed to do their job; there is no time to learn things completely. Thus the real issue in workplaces is to cope effectively with real-life situations.

[17] this case study is authored by Ari-Matti Auvinen (HCI Productions Oy) based on the first hand personal experiences in working with KONE Elevators

Case study V: Wikipedia[18]

According to their own presentation on their web site (see in more detail http://www.wikipedia.org) "Wikipedia is a multilingual, Web-based, free content encyclopedia project. The name Wikipedia is a portmanteau (combination of words and their meanings) of the words wiki (a type of collaborative Web site) and encyclopedia. Wikipedia's articles provide links to guide the user to related pages with additional information.

Wikipedia is written collaboratively by volunteers from all around the world. Since its creation in 2001, Wikipedia has grown rapidly into one of the largest reference Web sites, attracting at least 684 million visitors yearly by 2008. There are more than 75,000 active contributors working on more than 10,000,000 articles in more than 250 languages. In July 2008, there are 2,460,544 articles in English; every day hundreds of thousands of visitors from around the world make tens of thousands of edits and create thousands of new articles to enhance the knowledge held by the Wikipedia encyclopedia.

Visitors do not need specialized qualifications to contribute, since their primary role is to write articles that cover existing knowledge; this means that people of all ages and cultural and social backgrounds can write Wikipedia articles. Most of the articles can be edited by anyone with access to the Internet, simply by clicking the edit this page link. Anyone is welcome to add information, cross-references or citations, as long as they do so within Wikipedia's editing policies and to an appropriate standard. Substandard or disputed information is subject to removal. Users need not worry about accidentally damaging Wikipedia when adding or improving information, as other editors are always around to advise or correct obvious errors, and Wikipedia's software is carefully designed to allow easy reversal of editorial mistakes."

Wikipedia is a new social innovation, and by using peer production there has been created a new form of encyclopedia to be used in the Web. However, as the number of articles and contributors has grown, also Wikipedia has had to alter its operative mechanisms, including the creating norms on authoring and editing the articles, developing the internal quality criteria and quality processes and modifications in its user administration. In the various articles, Wikipedia also has warnings of the potential incompleteness of articles, missing references etc.

The key issue in Wikipedia has been the eagerness of various people to share their knowledge and information with other users. The "social discipline" within Wikipedia has been strong and the huge majority of authors of Wikipedia are experts in their own area. Wikipedia´s strength has also been the opportunity to comment and edit the content, and thus also to add comments from different perspectives.

In admiring the success of Wikipedia, it should also be stressed that solutions, such as Wikipedia, require also strong centralized resources – these are e.g. data structure, content structure, structure of quoting, search tools and search structure, various tools to author and edit content etc. Fluent dispersed content creation requires a strong centralized structure, which can enable various dispersed operations.

[18] this case study has been authored by Ari-Matti Auvinen (HCI Productions Oy) and is based on the Wikipedia site (http://www.wikipedia.org – read on 17 July 2008), on Tapscott, D. – Williams, A.: Wikinomics. Portfolio, USA 2006, and on personal experiences

Case study VI: Sourceforge[19]

SourceForge.net is the world's largest Open Source software development web site, hosting more than 100,000 projects and over 1,000,000 registered users with a centralized resource for managing projects, issues, communications, and code.

SourceForge.net has the largest repository of Open Source code and applications available on the Internet, and hosts more Open Source development products than any other site or network worldwide. The essence of the Open Source development model is the rapid creation of solutions within an open, collaborative environment.

Members of the Sourceforge community are responsible for developing the software that drives the web such as Apache, the world's most popular web server, and it is the tools provided by Sourceforge that they use in their work.

A project at Sourceforge may be started by a developer or a group with a software project at one of several stages of development

- an idea for a Software project
- a proposal with a specification and development plan
- a functioning or partially functioning software application
- a fully functioning software title

In most cases the initiating developer wants to attract other developers to help with the project and has chosen Sourceforge as the best place to do it. The vast majority of projects are started by inexperienced developers, attract little or no interest from others and after a brief flurry of activity, languish in the archives until the initiator finally loses interest. At the other end of the scale a very few are extremely successful, with many participants and thousands of downloads of the projects products by the public.

Sourceforge provides statistics about the projects it hosts with an overall 'activity rating' that is calculated from the overall popularity of the project amongst its participants and by the public.

Sourceforge consists of a large number of projects. Anybody can start a project and begin using the tools provided. There is no charge for the service; it is funded by advertising, sponsorship and user donations. When a project is started it is immediately provided with a complete set of tools to begin work. Each project on Sourceforge has the same set of tools.

During the development of a software project, a great deal of existing knowledge is utilized and new knowledge created. All software is built upon a foundation of existing software so a comprehensive understanding of the connecting modules and system within which it operates is vital for a project to succeed.

Types of knowledge utilized or created in a software project:

- technical documentation of related or connected software
- books & articles describing techniques or processes
- archived discussions from previous related projects
- source code
- help files & FAQs

[19] this case study has been authored by Michela Moretti (Scienter Italy) based on the materials by Marcus Clements (Brighton Art, United Kingom) within the framework of Praxis project

Everyone understands the value of archiving information. We only need to be asked the same question twice before it's a good idea to write down the answer somewhere and make it easily found by the next person with that question. Thus elementary in Sourceforge are the archived discussions (nearly all important decisions made by developers collaborating on software projects will be made in some kind of archived discussion, be it archived email, a forum or a news group) and documentation (as a project continues the consensus of opinion and accumulated knowledge that is represented in the archives is compiled into a more formal structure in the project documentation). However, also cross-referencing and linking are essential elements in the successful projects.

The success of Sourceforge shows clearly both the demand in the open-source area for such a joint workspace, which enables communication among peers in often very complex issues. However, also the provision of effective tools for all various actors within the Sourceforge is one critical element of success.

Case study VII: Wiki for Health Care Professionals (~ 'Pflege-Wiki')[20]

The Wiki for Health Care Professionals (i.e. 'Pflege-Wiki') is a multilingual (German and English) Wiki project for Health Care Professionals and especially for nurses. The Wiki (German version[21]) started in August 2004 as a private initiative and is run since July 2005 by the 'Association for the Promotion of Unrestricted Information on Nursing' ("Verein zur Förderung freier Informationen in der Pflege e.V."). This association finances the services via member fees and donations. The English version[22] was added in May 2006; in March 2008, collaboration with the Italian NursePedia[23] was established.

At the moment, the German version contains more than 4.400 articles free for use and distribution in the sections:

- health care in practice (with subchapters like geriatric care, sick-nursing, paediatric nursing, etc.)
- terminology – pathology
- vocational education and training
- management & pedagogy for the health care sector
- academic studies
- professional associations; press releases
- links, forums, chat
- care facilities, ambulant care services
- book reviews, events, podcast.

The 'Pflege-Wiki' - like typical Wikis - offers the possibility to read, write and modify articles about subjects relevant to the health care sector. Each contribution is reviewed by the other users of the service, so that each article is produced collaboratively.

Like other wikis, 'Pflege-Wiki' records former versions of articles in order to make the history of an article / a concept visible. In rare cases it is used to re-establish an article after intended or unintended 'vandalism'.

20 this case study has been authored by Thomas Fischer and Thomas Kretschmer (ILI)

21 see http://www.pflegewiki.de

22 see http://en.nursingwiki.org

23 see http://www.nursepedia.net

The ‘Pflege-Wiki” animates visitors not only to read, write and modify the articles, but also to add photos, to link the Wiki to personal and official websites and to distribute the articles in other media (e.g. printed). All material within the ‘Pflege-Wiki’ is published under the GNU General Public License and can be used and copied without any restrictions[24].

Each article as well as each registered user has a discussion forum, where authors and users can get in contact or clarify certain aspects of an article. Registration is not necessary, but offers certain advantages (e.g. each article is signed with the nickname of the author; registered users have a personal page for self-presentation; registered user can ‘observe’ certain articles and receive a notification in case of modifications of these observed pages).

‘Pflege-Wiki’ offers a chat for all visitors of the wiki as well as podcasts (usually interviews with experts concerning actual problems and discussions).

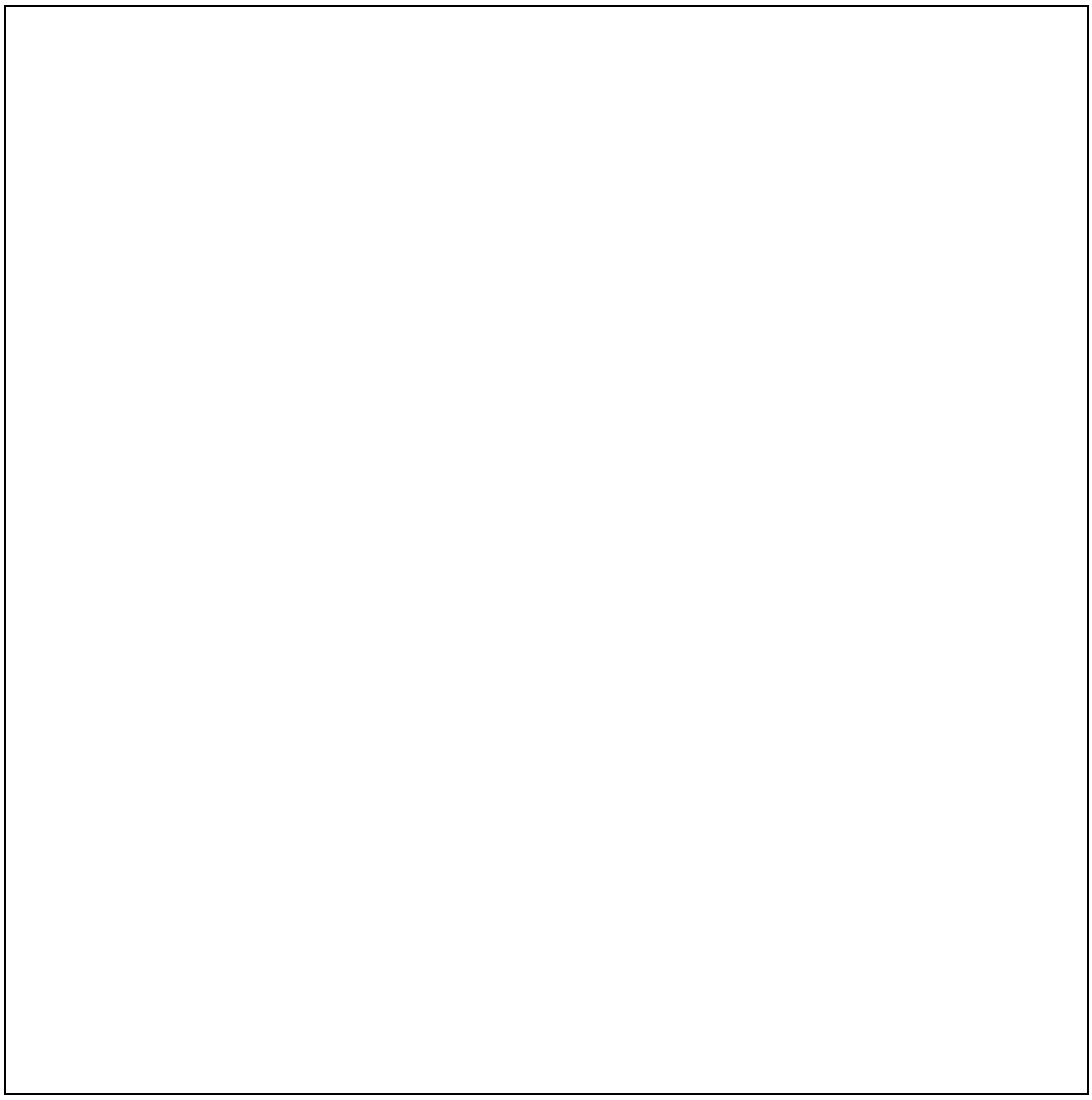
[24] for more details please see http://en.wikipedia.org/wiki/GNU_General_Public_License

Action point

You have now been acquainted with seven different case studies of peer produced content. In the discussion of quality, two different aspects have often been addressed. The first one is ***functional quality****, which in educational context addresses the issues of meeting the objectives and the rightful content. The second aspect is* ***technical quality****, which in educational contexts addresses the issues of technical fluency (e.g. appropriate presentation, right spelling, adequate linking etc.).*
Based on the presented case studies, you should now define the mechanisms the various presented cases utilized in their urge for functional quality and technical quality.

Functional quality measures

Technical quality measures

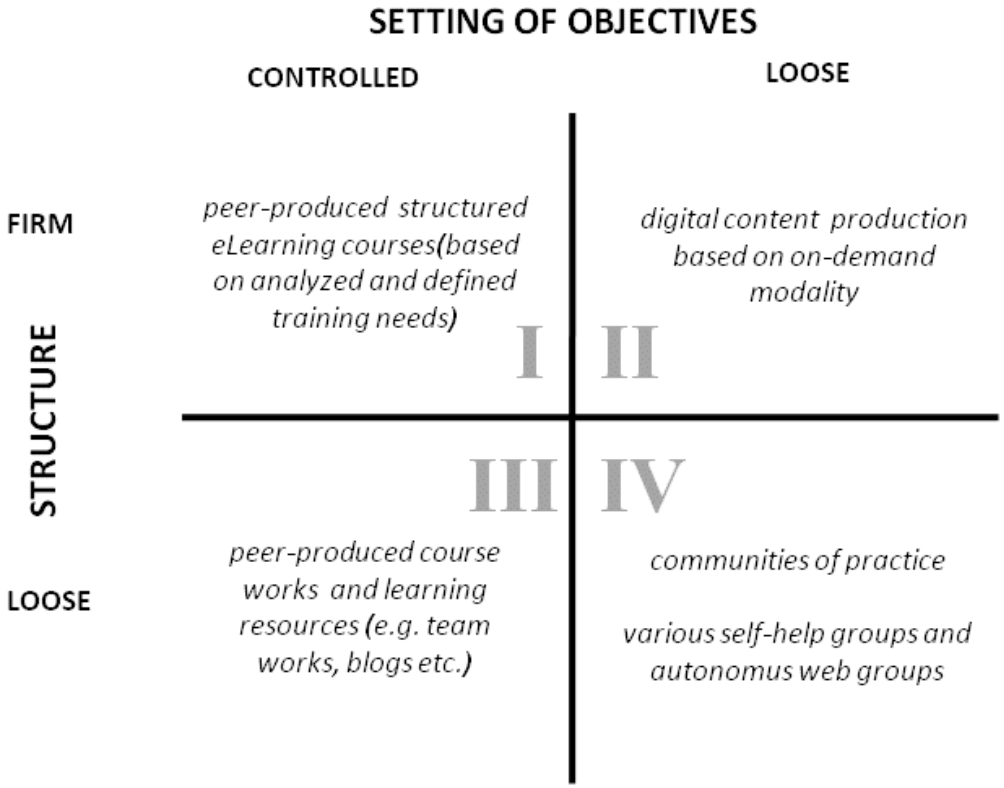


Based on the discussion in this section as well as the cases presented, we can present a simple classification of the various critical dimensions of peer production in eLearning and related fields.

The two critical dimensions are

- setting of objectives – who is setting the objectives for the peer-produced content: is it controlled and unified for all potential peer producers (e.g. a framework of a "course") or is it relatively loose (e.g. in Wikipedia authoring an article of my personal interest)
- structure – what structure is given: is the structure firm (e.g. composed of certain elements, tools and requirements) or the structure loose and not pre-defined (e.g. peers can use tools and structure of their own choice).

This is summarized in *picture 5*.



Picture 5: Contexts of Peer Production

Action point

In the following you should address two issues: Firstly you should define to which quadrant of the picture 5 do the various cases belong to. Secondly, based on your understanding and experience, discuss what are the challenges of quality of peer-produced eLearning in the different modalities (descibed by the different quadrants).

4 Approaches and methodologies for peer production

In this section we will give an overview of existing quality development tools and approaches for the field of peer-production. After a short introduction we give some background knowledge on quality for peer-production, and work out changes which occur due to the shift from expert models of quality to more learner and peer-oriented models of quality development.

The quality of eLearning has been discussed and researched in many European projects as well as in many international contexts. Ehlers and Pawlowski describe, in the discussion on quality of eLearning, one can distinguish between three different aspects in the discussion, namely

- different interpretations of quality
- different stakeholders with different perspectives on quality
- different forms of quality (input-quality, process-quality, output-quality).

This discussion has also lead to different interpretations of quality – and numerous definitions from various fields are available.[25] As in particular the wide discussion on quality in eLearning in general is well captured by the recent comprehensive book edited by Ehlers and Pawlowski[26], in this context it is not necessary to repeat this discussion, but rather concentrate on the key issues which are altering in the peer production of eLearning.

In the peer production of eLearning the essential feature is that the learners are also acting as creators of the content – in the new learning settings the separation between an "author" and a "consumer" is blurring. In practice, learners are no longer purely consumers but they actively participate in the learning process and thus influence it. As the borders between user and author are blurring, so do the roles of student and teacher.

This fundamental feature is also imposing a different view on quality, as quality is often to be defined and assessed by the same group of actors as the actual creation of the learning content. However, the quality approach to peer production can be more than just an emphasis on self-evaluation and its practices.

Many quality approaches also in eLearning rely on the conventional quality cycle. This quality cycle has included – since the writings of W. Edwards Deming in the 1950s - the steps of PDCA (Plan, Do, Check, Act). This approach has been modified during the last decades in many different ways, and also applied into

[25] Ehlers, U-D. – Pawlowski, J.: Quality in European eLearning: An introduction. In Ehlers, U-D. – Pawlowski, J. (eds.): Handbook on Quality and Standardisation in ELearning. Springer 2006.

[26] see Ehlers, U-D. – Pawlowski, J. (eds.): Handbook on Quality and Standardisation in ELearning. Springer 2006.

the area of vocational training. Wirth has presented that in eLearning the essential steps could be:

- plan
- do
- check
- compare.[27]

As a hypothesis we can claim, that in the development of a quality approach to peer production, the quality approach would mainly address the "process quality" issues – in other words: which processes implemented are assisting the quality of peer produced eLearning content. In addition, in regarding the quality processes, the peer production of the learning materials in their quality assessment can also be linked with benchmarking – or even more precisely, on "benchlearning".

4.1 Quality development of peer production[28]

Ehlers discusses the quality development in what he is referring to as "eLearning 2.0". In describing the phenomenon "eLearning 2.0", he points out that it describes a number of developments, trends and points of view, which require change from teaching to learning. The new point of view essentially connects eLearning with five characteristics:

- Learning takes place always and everywhere (ubiquitous) and therefore in many different contexts, not only in the classroom.
- Learners take on the role of organizers.
- Learning is a life-long process, has many episodes and is not (only) linked to educational institutions.
- Learning takes place in communities of learning (so called communities of practice. Learners participate in formal, as well as informal communities.
- Learning is informal and non-formal, takes place at home, at the work place and during leisure time and is no longer centered on teachers or institutions.

In the new environment, learners are highly self-directed, as learning does not only take place in institutions, but everywhere, during the course of one's whole life in a number of different episodes, in learning communities and social networks, using social software and individually compiled contents. Securing and developing quality in such learning scenarios thus has to focus mainly on the individual learning processes and the shown achievements (performance). The learner's perspective is more important than the organizational processes and / or the co called input factors. Quality assessment does not take place by using classical methods of expert- and standard based quality management, quality assurance or control, but by making use of more participative methods and

[27] see Wirth 2006

[28] this chapter is based largely on Ehlers 2009 (Web 2.0 – E-Learning 2.0 – Quality 2.0? Quality for new Learning Cultures)

responsive designs. The aim of the process is to reach an individualized assessment, which relates to the learning process.

Initially it seems paradox to talk about the quality of eLearning 2.0, as quality is often linked with checking by externally imposed standards. However, quality can also be understood in a development-oriented way, which means the enabling of learners to develop themselves in their own learning processes and consequently reach better results as far as quality is concerned. In this view, methods of self-evaluation, reflection and peer-evaluation are seen as more important. This kind of quality methodology does not have anything to do with normative, universally valid, but aims at improving the quality of the learning process.

In eLearning 2.0 learning approach, the learner has an important role as active constructor of learning materials (co-creator), personal learning environments and initiator of his or her own learning processes. Interestingly, this is a characteristic, which is often felt to be a barrier for integrating eLearning 2.0 into formal educational processes. This is because the competition of learners and teachers and/or other institutional actors during quality assessment seems to be insurmountable and only resolvable through a loss of power for the institution.

Action point

One of the key basic requirements for appropriate peer production are the motivated, self-directed learners. They also play an important role in the quality approach in peer production. In the following, discuss how in your organization you can strengthen and enhance the self-directness of the learners and discuss also the role of the learners in the quality approach.

Action point

Another key basic requirements for appropriate peer production are motivated, self-directed teachers and learning material developers, who could join their efforts. In addition, in many organizations also SMEs (subject matter experts) can be sharing their valuable knowledge by the methods of peer production. In the following, discuss how in your organization you can strengthen and enhance the motivation and self-directness of teachers, learning material developers and subject matter experts and discuss also their role in the quality approach.

4.2 Conditions for quality of peer production[29]

As a point of departure, eLearning 2.0 does not require a new mode of thinking or method of quality development, such as a new and completely altered philosophy of quality – no "educational quality 2.0" is needed. However, changed basic conditions and contexts need to be taken into account. Doing justice to these different contexts, different questions need to be posed when dealing with quality development, different objects evaluated, different criteria of quality applied and specific methods of quality assurance, enhancement and development used. In short: the role of quality development is changing.

While in traditional learning scenarios it mostly means the checking and controlling of quality, in eLearning 2.0 it is becoming more the role of an enabler of learning progress. Learning methods and quality development are moving closer together. Methods such as feedback, reflection and recommendation mechanisms are becoming more important. Typical basic conditions, which need to be taken into account in quality development for eLearning 2.0 scenarios, are explained in the following:

[29] this chapter is based on Ehlers 2009 (Web 2.0 – E-Learning 2.0 – Quality 2.0? Quality for new Learning Cultures)

❶ **From reception to participation:** the metaphor used for learning is changing. In eLearning 2.0, quality cannot be tied to the evaluation of a pre-determined learning environment or learning contents produced by an expert. Not the reception but the active participation is most important, that means the question in how far a learning scenario stimulates the creation of individual personal learning environments, the compilation of individual learning contents and sharing them with others.

Action point

As the metaphor for learning is changing from reception to participation, discuss in the following what does that imply for the quality approach in peer production of eLearning and what measures must be planned for and implemented to take advantage in this metaphor change.

❷ **From inspection to reflection**: quality development for eLearning 2.0 shifts the focus from conformity to a reflection of the learning process. Learners are supported in reflecting, recognizing and putting into effect their own learning progress, educational strategies, needs, etc. and in the course of their actions critically reflect the contribution of educational media. The aim is to achieve a personally ideal configuration of educational media and strategies, which is continuously developed through autonomous reflection.

Action point

Another important shift is the quality development alteration towards learning from the reflection of the learning process. Discuss in the following what measures must be planned for and implemented to take advantage in this change.

❸ **From product orientation through process orientation to performance and competence orientation**: the material that is used for learning and the processes of its supplier are not the focus of quality development. Quality development focuses on the learners' performance, their individually developed learning products, steps in development and similar aspects (for example in e-portfolios), which shape their way to decision-making and responsibility.

Action point

The focus of quality development is shifting from "product orientation" towards "performance and competence orientation". Discuss in the following what consequences this change has in the quality approach of your organization as well as in the quality approach of peer production in eLearning.

❹ **From planning education for the leaner to planning education by the learner**: quality of learning scenarios is often attempted to be achieved through careful analysis of the need for education, a comprehensive conception phase, feedback as far as the design of learning material and

development processes are concerned and the evaluation of learning processes. In eLearning 2.0, many of these processes shift from the supplier of a program to the learner. Quality concepts must therefore support the learners in their ability to develop quality through reflection, enable learner-oriented forms of evaluation and offer the necessary tools for quality development to the learners in their PLEs.

Action point

As stated previously, in eLearning 2.0 many key processes shift from the supplier of a program to the learner. Also the quality approach must therefore support the learners in their ability to develop quality through reflection. Discuss in the following what consequences this change has in the quality approach of your organization as well as in the quality approach of peer production in eLearning.

❺ **From receiver to developer of learning materials**: quality assessment in eLearning 2.0 scenarios does not follow the logic of a marketing effectiveness research to find out how the materials and characteristics of media optimally affect the learning process. It is not about learning process taking part in a unified learning scenario. Rather, the focus lies on processes of development, flexible usage and the validation of social communication processes with other learners.

Action point

In eLearning 2.0 the emphasis is on learners as key developers of learning materials. This sets also new requirements for the quality approach of organizations. Discuss in the following what consequences this change has in the quality approach of your organization as well as in the quality approach of peer production in eLearning.

❻ **From the "learning island" LMS to the internet as a learning environment**: eLearning 2.0 approach understand Learning Management Systems (LMS) as a mere starting point, as a signpost for their own search and use of material from the internet, their development and linking to other tools which can be flexibly arranged to become personal learning portals. Quality assessment then does not focus on materials from the LMS anymore but rather on the learning products and perhaps on the learning processes documented in an e-portfolio.

Action point

In eLearning 2.0 the emphasis is also moving from internal, proprietary learning management systems and "learning material reservoirs" towards the Internet as a learning environment. Discuss in the following what consequences this change has in the quality approach of your organization as well as in the quality approach of peer production in eLearning.

❼ **From tests to performance**: learning progress and achievements become visible not only in tests but rather in the learning process documented in portfolios (for example in wikis or web logs), learning products and social interactions.

Action point

In eLearning 2.0, learning progress and achievements become more visible and the assessment of learning shifts from tests to wider assessment of performance. Discuss in the following what consequences this change has in the quality approach of your organization as well as in the quality approach of peer production in eLearning.

4.3 Concepts and methods of quality development for eLearning 2.0[30]

Quality assessment of eLearning 2.0 focuses on the learning process. There is no use of external standards and inter-individual comparisons (such as tests or assessments). Rather, methods of self-evaluation, intra-individual development processes are employed for this purpose, which are not made via tests but via reflection and evaluation of learning products and e-portfolios. Even though eLearning 2.0 is a new development as a trend, substantial experiences have already been made with the learning models of *autonomous learning* and *learning in communities*, which are the basis for it, as well as with methods for quality assessment of learning processes.

Teachers can use these methods in order to evaluate the learning progress together with students and to enable individual planning. Teachers take on the role of mentor who gives feedback and helps with reflecting the learning experiences or evaluates e-portfolio postings.

Table 1: Methods of quality development for eLearning 2.0 (Ehlers 2009)

Methods of quality development	Quality assessment by
Self-evaluation	Learners with the help of/ feedback by teachers
Assessment of e-portfolios	Teachers
Social recommendation	Peers, learning communities
Evaluations aimed at target group	Teachers

In the following section, important aspects of methods for quality assessment, which are listed in *table 1*, are presented.

4.3.1 Self-evaluation

One important approach, which contains enormous potential for quality assessment of learning processes in eLearning 2.0 scenarios, is the concept of self-evaluation. The aim of it is not a complete (summative) assessment of learning achievement, but rather an improvement of learning abilities.

[30] this chapter is based largely on Ehlers 2009 (Web 2.0 – E-Learning 2.0 – Quality 2.0? Quality for new Learning Cultures)

"Self-evaluation is defined as students judging the quality of their work, based on evidence and explicit criteria, for the purpose of doing better work in the future. When we teach students how to assess their own progress, and when they do so against known and challenging quality standards, we find that there is a lot to gain. Self-evaluation is a potentially powerful technique because of its impact on student performance through enhanced self-efficacy and increased intrinsic motivation. Evidence about the positive effect of self-evaluation on student performance is particularly convincing for difficult tasks[31] [32], especially in academically oriented schools[33] and among high need pupils[34]."

In scientific literature, positive effects of self-evaluating processes on the learning achievements can be found (Maehr/Stallings 1972, Arter et al. 1994, Hughes et al. 1985). When undertaking these processes, students can gain insights into the profile of their own strengths and weaknesses. Rolheiser & Ross state that, if students evaluate their own achievements positively, they aim for more challenging objectives, engage in their own learning process more and mobilize more personal resources[35]. A self-evaluating process follows the following four steps:

❶ **Step 1**: Learners are involved in the definition of the criteria that are used for assessment. This happens in the form of negotiation. It has been shown that neither pre-determined criteria nor criteria solely developed by students are as effective as criteria that are developed together. Surveys show that criteria which are development in cooperation with learners, enhance agreement and motivation of the learners. Learners are also simultaneously coached in developing of their own goals and make experiences when choosing the level of difficulty. Furthermore, an attitude of advice develops between teacher and learner, which can be of great significance in eLearning 2.0 learning processes.

❷ **Step 2:** In this step, learners apply the criteria they have chosen to their own learning processes. As they do so, it can be important to provide them with examples for what such assessments can look like.

❸ **Step 3:** In a third step, learners receive feedback on their self-evaluation. The aim of this step is to calibrate the students' own assessments together with the teachers by using this feedback process. A triangulation of their own assessment, that of the teachers and that of the peers is taken into account.

❹ **Step 4:** In step four, the students are asked to develop plans for developing their own competences on the basis of their self-evaluation. They discuss strategies with the teachers in order to reach these goals.

[31] see Maehr and Stallings 1972
[32] see Arter et al. 1994
[33] see Hughes et al. 1985
[34] see Henry 1994
[35] see Rollheiser and Ross 2001

Action point

Self-assessment can be a powerful tool in the quality management of peer production. Regarding your own organization, assess in the following the benefits and disadvantages of self-assessment and discuss what supportive measures your organization should take in enhancing self-assessment by the learners.

4.3.2 Quality assessment with e-portfolios

E-portfolios – web-based portfolios – integrate different media and services. Students collect those learning products in their e-portfolio, which are made in the course of a class or even during the whole course of their studies. Students can use electronic portfolio to show competences and reflect their learning processes. Learning results, connected with remarks by tutors, teachers and peers, feedbacks and personal reflections are collected.

E-portfolios lend themselves to quality assessment ("Are e-portfolios an assessment *of* or *for* learning?" see Barrett & Carney 2005/ Ainsworth & Viegut 2006). E-portfolios can used when making the final assessment (summative) or for continuous improvements (formative). As can be seen in table 6, purpose, design and contents of portfolios are clearly different when used for summative assessment of the learning achievement or for formative assessment in order to support the learners.

Table 2: Purposes of an e-portfolio for assessment (based on Hornung-Prähäuser et al. 2007)

Portfolio for summative assessment	Portfolio for formative assessment
Purpose of e-portfolio is prescribed	The purposes of the portfolio are negotiated with the learner
It is fixed which learning products have to be part of the e-portfolio so assessment if possible	Artefacts have been chosen by the learner to tell the history of his or her learning process
Portfolios are usually fabricated at the end of a school term, semester or program and there is a deadline for handing them in	The portfolios are constantly updated over the course of a school term, semester or program with flexible timing
The portfolios and/ or artefacts are generally graded bases on a matrix and quantitative data for an external audience	The portfolios and artefacts are evaluated together with the learner and are used to give feedback, so that the learner can improve his or her learning process
The portfolio is normally structure by specified results, aims or standards	The organization of the portfolio has been determined by the learner or has been negotiated together with the mentor/ advisor/ teacher.
Sometimes the portfolios are used to make important decisions	The portfolios are hardly ever used to make important decisions
Summative: what has been learned up to now) (past – present)	Formative: Which needs for learning will exist in future? (Present – future)
Extrinsic motivation is necessary	Intrinsic motivation mobilizes the learner
Audience: external, little possibility for choice	Audience: learners, family, friends

Working with the portfolio has a double function. On the one hand, it is an innovative instrument for teaching and learning; on the other hand it serves as an alternative instrument for assessment. Learning scenarios supported by e-portfolios emphasize the learning process and enable a deeper understanding of learning processes in all participants.

Concerning quality assessment, the portfolio is understood as a way from achievement *diagnosis*, which is exclusively defined externally and test-oriented, to a more strongly self-directed achievement *presentation* by the learners. E-portfolios are aimed at competences. The idea is not to emphasize the *mistakes* the learner has made but what they are capable of doing. Advocates of portfolios often stress the natural function of a portfolio for bridging purposes, i.e. the link it

creates between teaching, learning and evaluating[36]. Thus, an e-portfolio is a method of evaluating achievements, which offers a combination of external and self-evaluation. Table 2 presents an overview of qualities for assessment oriented at e-portfolios in comparison to online examinations. In this process, e-portfolios can be used for evaluation/ assessment of subject-related abilities as well as self-competence. If e-portfolios are used as an instrument for assessing learners, the following aspects have to be taken into consideration:

- The new way of learning, presenting and refection requires mentoring and a "phase of socialization".
- E-portfolios are an instrument of development rather than for checking students' achievements.
- A qualitative assessment supports the learner-oriented, customized approach to prove achievements.
- The high level of subjectivity when it comes to the evaluation decreases when there are several evaluators (see also peer-review).
- It needs to be clarified beforehand in which way data will be exchanged and published.

Action point

E-portfolios integrate different media and services, and thus provide a comprehensive view on the competences of the learners. However, in addition to self-assessment, e-portfolios provide a unique view to the capabilities of the learners. Regarding your own organization, assess in the following the benefits and disadvantages of e-portfolios and discuss what supportive measures your organization should take in enhancing the use of e-portfolios.

[36] see Häcker 2005

4.3.3 Social Recommendation and Community Participation

In eLearning 2.0 learning scenarios, communication, feedback and the exchange within learning communities is essential. With the help of social software tools collaborations can be conducted and information exchanged, as well as evaluated mutually. Three methods are of special significance and first experiences have been made:

- Social recommendation mechanisms
- Peer-review method
- Peer-assist method

Social recommendation mechanisms are defined as those methods that serve the purpose of assessing the "true quality" of learning material in contrast to methods focused on experts[37]. According to this method, the members of a learning community evaluate materials available online. This happens for instance in databases for learning material which contain an assessment of saved learning materials on the basis of their usefulness and quality, or – in a less structured form – through learners creating link lists of materials, classes and resources available online which they deem especially valuable and qualitative.

On the one hand this method can be understood as "quality evaluation" in the course of which each learning material is assessed by learners. On the other hand it is also possible to give learners recommendations – á la Amazon – on which learning material is thought to be especially useful, so called social recommendations. Eric Duval, a Belgian professor, suggests a concept he terms "LearnRank". It is about making a ranking of learning material based on learners' evaluations and using it together with their "contexts" and intentions as a basic for learning recommendations. Of course, this does not guarantee that one finds the right text, but it increases the probability to find useful contents.

[37] see Duval 2006

Action point

Consider your own organization and its eLearning. In which areas could you use social recommendation mechanisms? What are the benefits and disadvantages of social recommendation mechanisms?

Peer review is a concept that has been introduced a number of times, especially in the academic sector. It deals with assessing quality by peers – that is colleagues or other learners – giving each other feedback. In the scientific sector, the texts discussed are often scientific proposals or publications. In the area of learning, especially in eLearning 2.0 scenarios, the peer-review can be used to attain feedback and quality assurance for results, learning progress and aims, which is given from other learners or members of the learning community. A simple application of the peer-review method for the purpose of quality enhancement in eLearning 2.0 scenarios is to invite different learning communities or members of different learning communities, to present them with the learning intentions, progress and the problems as well as solutions worked on and to ask them to do a review.

Peer reflection is a process aimed at creating situations for reflecting, in which the peers are asked to encourage the reflection of learning processes by means of their own experiences. One community could, for instance, share with another one how it structure their projects, why they used the material they used and so on.

One possibility to check on the quality of learning processes is learning from other people's solution, respectively entering a peer learning process with others. One model that has recently been gaining more importance is the peer assist model[38]. It is a structured reflection in the context of a social network, which is carried out via social software. This method is clearly distinct from peer review (see table 3). It primary aim is to simulate learning processes. By employing the

[38] The models of peer assist, peer learning and bench learning are so to speak the logic continuation of peer review processes.

method for eLearning 2.0 scenarios, social assets are used for further developing one's own solutions or for resolving learning difficulties, which come up in the learning process. Structured reflection of a learning process is possibly by broaching the issue of the learning processes, the results and documented outcomes in the peer assist process.

Table 3: Differences between peer review and peer assist processes (based on Commonknowledge 2007)

Peer review	**Peer assist**
aim: evaluation	aim: learning, improving knowledge
Evaluative	collaborative
The task is to criticize a paper	The task is to learn with and through a team.
Reviewers are chosen by others.	The members themselves choose the assistants.
Often, there is an attempt to reach constructive and in every case positive evaluation results "by all means"	processes for solving problems.
Some actors are always reviewers.	That who assist today can call for a peer assist process tomorrow – changing one's role is supported.
Report is mostly made available for the management.	The process is aimed only at those who called for it.

The peer assist process is a structured process that can be employed in eLearning 2.0 scenarios by using social software. It deals with linking and strengthening a learning community with the explicit aim of discussing one's own strategies for problem solving and learning approaches, reflecting and improving. Table 4 shows how peer assist can be used in eLearning 2.0 scenarios.

Table 4: Online peer assist processes (Ehlers 2009)

Phase	WEB (2.0) tools
Preparation	
„Peer assistee" send introductions to (six) peer assistants	E-mail
A peer assist moderator needs to be found and invited.	E-mail
A peer assist wiki or blog needs to be made.	WIKI, blog, protopage, etc.
Execution	
Round 1: presentation of problem (10 min.)	Notes on peer assist wiki/ blog/ application sharing, collaboration platform *Examples:* A concept developed by learners for the purpose of problem solving is presented in form of notes, a concept for a (final) paper etc. is briefly presented, a problem is presented
Round 2: peer assistants can ask topical questions (30 min.)	Online chat, collaboration platform
Round 3: peer assistants make suggestions for solutions and give evaluations (45 min.)	Suggestions are entered into a forum for discussion, everyone reads the other participants' suggestions.
Round 4: moderator invites all participants to give a finishing suggestion (30 min.)	Final round as a post in a forum for discussion.
Round 5: peer assistee decides on how to continue and informs the group (10 Min.)	The peer assistee informs participants in an online chat which suggestion he o she has chosen.

Action point

Consider your own organization and its eLearning. In which areas could you use peer reviews and peer assist methods? What are the benefits and disadvantages of peer reviews and peer assist methods?

4.3.4 Evaluation processes aimed at a target group

Today, evaluation is often used for assessing learning processes and results. A large number of contributions in scientific and praxis-related literature with processes that have turned out to be successful can nowadays be drawn upon. In the educational sector, the current practice for evaluation envisages a group evaluating a learning/teaching situation with the help of an evaluating instrument (e.g. a questionnaire). This is problematic in eLearning 2.0 scenarios as the learning progressions and PLEs are potentially different – even in one and the same class. That is why, as regards evaluation, it makes sense to resort to a practice of evaluation strongly aimed at the target group.

This can happen by admitting a target-group-specific profile of evaluation instruments. One way of doing so is for example asking the learners to not only answer questions from an evaluation questionnaire but simultaneously inquiring into how *important* respectively *relevant* they deem this evaluation item for a learning process. Is the item irrelevant to a learning process than it is evaluated to be of small importance and is consequently also not taken into account as much as other items as far as the overall evaluation is concerned. “Artificial” estimation of dimensions that are unimportant to the learning progress are thus avoided. Another advantage results from learners conducting not only an assessment but at the same time a reflection on what was of significance to their personal learning progress. The questionnaire, which should be used for such an evaluation, should cover all relevant areas in an adequate manner.

A method like this, which is aimed at a certain target group, is conceptually close to experiences that have been made in the area of responsive evaluation. According to this method, participants do not only assess given objects but are included in the definition of objects to be evaluated. In eLearning 2.0 scenarios, this can potentially lead to all participants in the evaluation process “constructing” a different questionnaire by assessing issues differently. The results of such an

evaluation procedure cannot be processed and handled in the same way as results of a “normal” evaluation. A learning group is not understood to be *homogenous* entity. In contrast, target-group-specific suggestions and solutions for the occurring results the evaluation yields will have to be found.

5 Technical tools and technologies for peer production

In this chapter we summarize the technical tools and the technology which are used in peer production. It is also necessary to define some key terms which are closely related into the peer production concept. Although during the recent years learning and information provision through Internet and its different services have become one of the most popular themes in educational development, it is good to remember both the relatively short history of the "Internet age" as well as the utilization of some of the key concepts already mentioned earlier in different contexts.

5.1 Technical tools and technologies in the Web 2.0 era

The key to the potential to use Internet and its services in vocational education and training stems from the fact that the metaphor for using Internet has changed from information distribution and delivery (which many call the "Web 1.0") into active participation and information creation by the users (which may call the "Web 2.0"). In particular, with the introduction of called "social media" [39] and "social networks" [40] the peer production has been recognized, not only as a challenge the traditional education, but also creating a new valuable approach into education - and particularly into the eLearning development.

Actually the term of "Web 2.0" was first introduced 2005 by Tim O'Reilly [41]. Explaining "Web 2.0" is not that simple – it should be pointed out that "Web 2.0" is not any new remarkable invention which has been the starting point for new innovations in web-based tool development. The "Web 2.0" is rather a joint denominator for all intensive development in web-based communication. Thus it is rather an evidence for achievement of a next stage in networking and communication over the Internet. The "Web 2.0" can be seen as a concept which sums up different development trends of web-based services, applications standards, technologies and most of all how these all are used in social communication and networking.

In education and training development and in implementing eLearning we also can see the move towards "eLearning 2.0" in which different web communication and information flow tools are used for educational and learning purposes. However, the (open) social networks and social media are critical for peer production and its integration to traditional learning approaches. We understand

[39] however, it is needed to be noted that the discussion of "sociomedia" in its early years stems already from the beginning of the 1990s – see e.g. Barrett 1994

[40] on early stages of social networks – see e.g. Harasim 1995

[41] see in more detail O´Reilly, T.: What is Web 2.0? - Design Patterns and Business Models for the Next Generation of Software
- http://www.oreilly.de/artikel/web20.html (read 24 July 2008)

that “social media” is describing the media environment, which enables mutual participation, information production and receiving, handling and providing it for others to use. As discussed in previous chapters, the social media have been essential in the success of user-created content We see the (open) “social networks” as a prerequisite for successful peer production.

One important feature in the recent development is also that the creative power of the users has been nurtured by the provision of different media for peer production. Thus the users are not limited to text only – they can also produce easily and cheaply their content by other media, such as photos, images, audio clips, video clips etc. Another important feature is that in addition to the conventional computer networks, also novel networks – such as mobile networks – can be widely used.

5.2 Technical tools for peer production

In the following we describe some contemporary approaches for peer production – these might often be called “Web 2.0” tools. However, in the quick development cycle of “Web 2.0”, new tools, approaches and services emerge almost daily. Although many tools used also in the “Web 2.0” environment have also their commercial dimension, the important feature in the development of many new “Web 2.0” tools is their open source background. These tools can be seen as services, applications or distribution platforms, which provide platforms for peer production. With the open source approach also the business models and earning models alter – however, open source does not mean free or totally non-commercial.[42]

Blogs have been around since the mid 1990s when they were mainly presented as personal diaries on various Internet home pages (the name stems from the combination of web + log book). Today blogs have become – among other things - efficient tools to express opinions, to distribute information and also to serve as commonly read personal diaries. Modern blogs can also easily mix different media – text, graphics, pictures, video clips, audio clips etc.

What makes blogging so powerful is the linking of different “bloggers” in blogging platforms by forming so called blogospheres where information can spread extremely fast. The linking of different blogs has become a very important tool for peer production particularly in cases where students themselves are encouraged to become peer producers and at the same time be active on commenting blogs of fellow classmates[43] [44]. Blogs are often tagged with pointing out keywords or they are listed according the titles which are then visible in different blogosphere or blog account hosting sites – also typical for blogging is regular updating which will often “push” old information to be invisible and history of the blogging is thus difficult to follow.

[42] see e.g. Goldman – Gabriel 2005
[43] on educational uses of blogs – see e.g. Williams 2004
[44] see also Richardson 2006

Typical for blogging tools is that most of them are free for the users and thus the threshold to start active blogging is very low.[45]

Wikis and other text based collaboration formats are describing a webpage or set of web pages that can be easily edited by anyone who is allowed access – the most well-known of the wikis is Wikipedia[46]. The fundamental idea of wikis is to provide information voluntarily, decentralized and openly. The information can be added, corrected or totally new topics can be created without changing the whole structure of the site. Information providers are also reviewers of the information. Wikis provide also a way to common structured knowledge creation and distribution and thus they can serve as an effective tool for learning.[47]

The quality of information has been staying rather solid in the various wikis - despite of minor vandalism appearing time to time in wiki-based web sites. Today is easy to create own wiki environment for various topics. There are so called "wiki farms" for hosting the sites, which have encouraged development of wikis also in universities and other educational institutions. In wikis the history of information or individual page is always visible and that helps to keep provided information valuable.[48]

Tagging and social bookmarking allow users to save their bookmarks online, tag them and share them with others. In practice it is possible to install from web (free of charge) programs which help you to store your bookmarks online, tag them and share them with your colleagues and students. Use of tagging has become common way to look for information by using keywords. By using the tagging the user is able to select information wanted. The key to the applications of social bookmarking is metadata (information on information), which enables the sharing of this information. The probably best known social bookmarking application is del.icio.us, in which users can tag each of their bookmarks with a number of freely chosen keywords.[49]

Different tools used for tagging and social bookmarking help users to search and identify information with keywords and topics and to save it all in own directory with favorites/bookmarks online. In practice they are personal websites where user can store archive their favorite web pages. The importance of tagging and social bookmarking is in sharing the important links and information sources with other users. This enables - instead of replicating the information content on certain web sites - the sharing of the links and ensure the validity of the information.[50]

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[45] see e.g. http://c4lpt.co.uk/Directory/Tools/blogging.html (read 24 July 2008) of the various blogging tools available
[46] see http://www.wikipedia.org
[47] see e.g. Parker – Chao 2007
[48] see e.g. http://c4lpt.co.uk/Directory/Tools/wiki.html (read 24 July 2008) of the various wiki tools available
[49] see http://del.icio.us
[50] see e.g. http://c4lpt.co.uk/Directory/Tools/bookmarking.html (read 24 July 2008) of the various social bookmarking and tagging tools available

Media sharing means the services which enable everyone interested to share multimedia in the public. Most common example of this service is YouTube for videos[51]. There are plenty of different sharing services for videos, photos and podcasting.

Podcasting as a term were initiated with launching of iPod - a portable digital audio player by Apple. Contemporary, the term is referring any software and hardware combination that permits automatic downloading of audio files for listening at the user's convenience. The key breakthrough for podcasting has been the audio signal compression technology – in particular, the MP3 standard.

In education the podcasting is a powerful approach as the students are familiar with the underlying technology application. By combining the audio blogging with podcasting the lectures, experts' interviews etc., it is possible to provide convenient methods in delivering the educational content. Also the students can easily add their own content using audio blogging and distribute those audio blogs by podcasting.

Podcasting is becoming increasingly popular in education. Podcasts enable students and teachers to share information with anyone at any time. An absent student can download the podcast of the recorded lesson. It can be a tool for teachers or administrators to communicate curriculum, assignments and other information with parents and the community. Remarkably, a number of leading US universities and colleges provide their selected lectures through the iTunes University site hosted by Apple.[52]

[51] see http://www.youtube.com
[52] see http://www.apple.com/education/itunesu_mobilelearning/itunesu.html (read 24 July 2008)

Action point

Today there are available a number of good and tested web-based tools for peer production. Important technical features according to the quality of peer production are e.g. easy access to the tools, their technical reliability, and their feasible economic costs. In many developed cases of peer production of eLearning, several compatible technologies and tools have been used. In the following assess the strengths and weaknesses of different tools for peer production and also consider these tools according to the quality of peer production.

Blogs
Wikis
Social tagging and bookmarking
Media sharing
Podcasting

5.3 Newer Web 2.0 services

There has been quick development in a number of new services, which will also change the environment of peer production in eLearning. This following summary table is based on the publication by JISC Technology and Standards Watch from February 2007 and it is authored by Paul Anderson.[53] We have added the last three areas from other sources to the table (see *table* 5) by Anderson.

Social networking	Professional and social networking sites that facilitate meeting people, finding like minds, sharing content – uses ideas from harnessing the power of the crowd, networks effect and individual production/user generated content.
Aggregating services	Gather information from diverse sources across the Web and publish in one place. Includes news and RSS feed aggregators and tools that create a single webpages with all your feeds and emails in one place – uses idea from individual production/user generated content. Collect and aggregate user data, user 'attention' (what you look at) and intentions – uses ideas from the architecture of participation, data on epic scale and power of the crowd
Data "mash-ups"	Web services that pull together data from different sources to create a new service (i.e. aggregation and recommendation). Uses, for example, ideas from data on epic scale and openness of data-
Tracking and filtering content	Services keep track of, filter, analyze and allow search of the growing amount of Web 2.0 content from blogs, multimedia sharing services etc. Uses ideas from e.g. data on epic scale.
Collaboration	Collaborative reference works (like Wikipedia) that are built using wiki-like software tools. Uses ideas from harnessing the power of the crowd. Collaborative, Web-based project and work group productivity tools. Uses architecture of participation.

[53] Anderson, P.: What is Web 2.0? - Ideas, technologies and implications for education. JISC Technology and Standards Watch, Feb. 2007 – at http://www.jisc.ac.uk/media/documents/techwatch/tsw0701b.pdf (read 24 July 2008)

Replicable office-style software in the browser	Web-based desktop application/document tools. Replicate desktop application. Based on technological development.
Sources ideas or work from the crowd	Seek ideas, solutions to problems or get tasks completed by outsourcing to users of the Web. Uses the idea of power of the crowd.
Virtual worlds[54]	Online virtual environment where content is created in the context of online game-like 3D digital environment to which users subscribe.
Social tagging or folksonomy[55]	Ad hoc classification scheme (tags) that web users invent as they surf to categorize the data they find online.
Peer production news	Web sites combining social bookmarking, blogging and syndication with a form of non-hierarchical, democratic editorial control. News stories and websites are submitted by users, and they promoted to the front page through a user-based ranking system.

Table 5: Description of new Web 2.0 technologies (Anderson)

The richness of newer services on the Web provides also novel opportunities to utilize them to promote quality in peer production of eLearning. Social networking can work as an important tool to identify interested people outside of the own organization for peers to conduct peer reviews as well as to work in receiving/giving "the second opinion" on produced eLearning materials and contents.

Aggregating services are providing easy-to-use services in collecting essential content across various web sites. It easens benchmarking of existing learning materials, but also provides assistance in "institutional peer learning" – i.e. finding out what other entities have published on the Internet. The data mash-ups serve the same function, although with a different technical realisation.

The new collaboration tools and services provide fresh opportunities to work across organizations. The various wikis are increasing, but also other collaboration and groupware tools are gaining ground quickly. Thus practical day-to-day work both within organizations as well as across organizations is easy to organize. For the quality management of peer production this means practically that the back-and-forth sending of files and difficult change tracking can be replaced by the use of common collaborative tools and real time maintenance of various documents.

The essential trend in the new Web 2.0 services is known as "cloud computing". It refers to common business applications online that are accessed with an Internet browser, while the software and data are stored on the servers. The users of "cloud computing" customers generally do not own the physical

[54] see e.g. Guest 2007
[55] see e.g. Pettenenati – Cigognini 2007

infrastructure – rather they are renting the usage from a third-party provider (such as Google, Microsoft or Yahoo). The users consume resources as a service and pay only for resources that they use; however, individual users are not often directly paying for the services, but accept e.g. advertisements in the services used. Thus also the replicable office-style software will be used with an Internet browser, although the files are saved on a server administrated by the service provider. Importantly for peer production, the sharing of files and content becomes easier and more fluent, if the users want to share their conetnt with their colleagues.

Also virtual worlds (such as SecondLife) are creating novel opportunities for peer production of eLearning and its quality assurance. While the content is displayed in virtual worlds easily accessed by the users, also the feedback from the users can be organized fluently.

Social tagging is basically sharing your tags with other users. Social tagging can be linked with the mechanisms of social recommendation, but in social tagging the users can also share their sources of knowledge and information with other users. The peer production news are news created by peers, and thus they also can provide an important element in keeping the various users on track of the latest developments.

In all, many of the newer Web 2.0 services are still young (and some still in their infancy in late 2009), but many of them provide easy-to-use tools to the quality work, especially in areas of fluent document sharing and routing as well as collaboration both within the organization as well as across organizations.

Action point

The amount of new tools for peer production are increasing with a fast speed. Above we have listed some emerging technologies. In the following, explore your experiences (if you have gained any) of these new tools and discuss how they could be assisting the task of quality management of peer production of eLearning in your organization.

6 Enabling peer production

In this chapter we discuss the important enablers of peer production of eLearning. As we discuss in detail later in this chapter, using peer production can be seen and should be seen as a strategic choice in organizing learning. Thus it must also be supported accordingly within the organization.

Peer production of eLearning requires various enabling and supporting structures. Peer production does not just happen, it can be and it must be planned and supported. We should remember that the quality approach of peer produced contents in various environments is supported by a number of compatible features.

Consider Wikipedia (see also the case study provided in the case study section) – Wikipedia enables easy creation of new entries and easy editing of the existing content. However, we should also recall that the Wikipedia is based on a well-defined database (or in fact many databases) with appropriate features, such as user account administration, content routing (including navigation), content indexing, search engines etc. Wikipedia provides also a web-based text editor, which provides also spell checking and other word processing features. It is technically possible to attach annexes, create links (most links are created automatically), create tags for contents etc. And finally: there is a clearly defined structure how to present an article and a clear route from the creation of an article to the publishing and updating of an article.[56]

Or consider the Finnish Tax Academy (see their case in the case study section). Their management ensures that the peers producing eLearning content can use their working time 20 person hours per one hour of learning materials. Also in their annual job definitions is included the task of producing learning content for sharing – it justifies these peer producers to use their working hours for content creation. Importantly, the Finnish Tax Administration does not separately compensate peer production of learning materials, but wants to see it as an important part of everyday work of the subject matter experts.

Or consider Xerox and their Eureka application (see their case in the case study section). They provided a clear toolset with a clear procedure to empower the maintenance technicians in the field organization to produce their practical content. They systematized the process of content creation by the provision of a clear structure and a technical interface – more importantly, they also provided a clear route of the peer-produced content from creation to updating and enabled the participation of the field maintenance technicians to this process by ratings etc. However, Xerox was providing an appropriate database application and ensuring the access to application (both for the content creation as well as the utilization of the content) for its field organization.

[56] of Wikipedia – see in more detail Lih 2009

These cases show that quality of peer production can and must be planned. The approaches might vary according to the level of freedom in the structure and in the setting of objectives. In the following, we have defined the enablers of quality in peer production of eLearning to consist of the following aspects:

- enabling policies and procedures
- enabling processes
- enabling tools.

6.1 Enabling policies and procedures

Although the use of peer production in eLearning might be an appropriate pragmatic way to develop eLearning in an organization, it should also be supported on a strategic level by the management of the organization. Naturally, we can see in organizations different levels of managerial support: the management measures can allow a working form or they can actively support and promote a working form.

The organizational support to peer production of eLearning can take place by several different methods. For instance, these can include the following:

- active management support in promoting peer production as a Web 2.0 approach
- use of working time and other resources of the organization for peer production (this aspect is mainly covering the teachers and supporters), including clear guidelines for the compensation policies and practices
- pedagogical support for peer production, including clear procedures for peer reviews and other joint working methods
- rewarding peer production – are peer produced outcomes rewarded in a similar way than conventionally produced outcomes (e.g. are learners accredited for peer production of eLearning, are teachers rewarded for peer production of eLearning)
- access to various (digital) resources , including also assistance in the questions of Intellectual Property Rights (IPR).

Action point

In the following, assess you own organization's policies and procedures for peer production and also list recommendations to promote policies and procedures to promote peer production of eLearning.

Existing policies and procedures for peer production	**Recommendations for policies and procedures**

6.2 Enabling processes

We discussed above the enabling policies and procedures, which build an organizational basis to enhance the use of peer production in eLearning. However, these policies and procedures must be also supported by various day-to-day working processes.

The practical support processes by the organization can be many fold. Examples of various enabling supportive processes can include, among others, the following:

- active "communities of practice" within the organization to exchange learning experiences and good practices
- training the key actors in the peer production approach within the organization
- facilitation of active communication and experience sharing between the key actors
- support for intraorganizational and interorganizational work in the area of peer production
- practical support to peer production by the provision of appropriate tools.

Action point

In the following, assess you own organization's processes for peer production and also list recommendations to promote policies and procedures to promote peer production of eLearning.

Existing enabling processes for peer production	**Recommendations for improved enabling processes**

6.3 Enabling tools

The number of various tools for peer production has been quickly growing – many of us use tools, such as wikis, blogs, collaborative working spaces, file sharing etc. However, for an organization it is important to ensure that it promotes tools to which all have access and which can be used easily by as wide an audience as possible. Also in peer production ”access is everything”. Thus the organizational challenge is not whether you are using the newest and most advanced tools, but rather that the tools you are using can serve in the best possible way your actual goals.

Unfortunately, often also the problems with the compatibility of the tools create unnecessary thresholds for many to participate in peer production. This might also mean that the technical support staff and the IT support staff are reluctant in supporting the peer production modality, as they fear that their work will increase with the technical support staff. In particular in large companies and governmental agencies there might be also clear restrictions to use many applications of ”social software”. Desired or not, this must be taken into consideration in the design of your activities.

In discussing the enabling tools, the following aspects, among others, should be considered:

- access to the tools used: do all potential users have an easy access
- technical features of the tools: are the tools easy-to-use

- financial impact of the tools: are the tools provided free-of-charge or are there economical limitations for use
- data security and Intellectual Property Rights: are the tools provided ensuring data security and are their IPR policies clear and acceptable
- required user support: is user support required and how is it organized
- longevity of the tools: do we expect that the tools are available in the foreseeable future?

Action point

In the following, assess you own organization's tools for peer production and also list recommendations to additional tools to be used or tools to be replaced to promote peer production of eLearning.

Existing tools for peer production	**Recommendations for improved tools or additional tools**

7 The QMPP quality approach

In this chapter we describe the QMPP quality model which has been evolving and developing based on our field work both with the four different practical pilot projects as well as with our discussions with the experts in different expert panels. We also introduce four case studies undertaken during the QMPP project and discuss their quality factors.

7.1 Basis for the QMPP quality approach

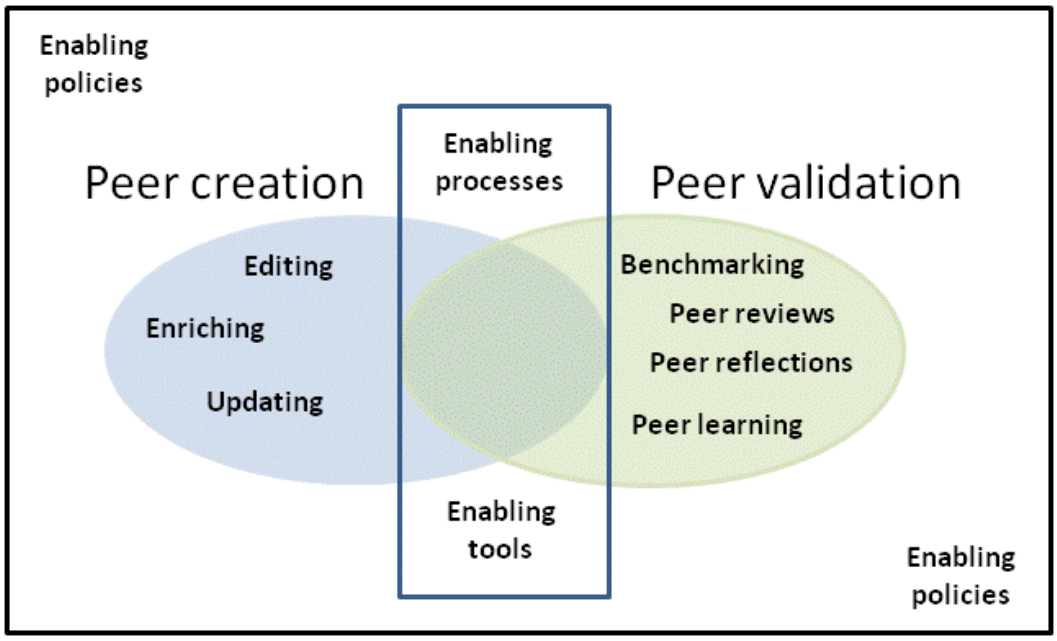
The quality management challenge in eLearning content produced by peer production can, however, undermine the merits of this approach and method. The quality work methodology in peer production is at its best dispersed and fragmented. Often it has also been claimed, that the very nature of peer production is its free flow and thus any formal mechanism (including the quality approach) would be drastically against the creativity factor. At the moment there are already a number of useful tools and approaches used (such as tools for peer reviews, tools for creating own wikis, dictionaries etc.) to ensure and improve the quality of peer produced eLearning content.

The importance of peer production of eLearning content will grow especially in the sector of vocational education and training as well as in professional continuing education. Many organizations face challenges of shortening life-cycle of learning content as well as operational challenges in providing required learning content with short lead times and lower costs. However, it is also understood that the learning content produced by peers (based on professional experience) can be more accurate and attracting than “clinically produced” learning content by external e-learning experts.

Peer production has great potential in the area of vocational education and training. The future workforce in Europe in many professions has not only to access and handle great amounts of information and knowledge, but even more importantly to produce various elements of information by themselves as an integral part of their work. Peer production is not only a novel method to produce eLearning content, but it is also an approach to empower a wide variety of professionals to the learning content production. Thus it has also an important democratic element in bringing the work-related learning content production to the actual level of users, tutors and learning supporters.

7.2 QMPP Qualityscape

The fundamental finding in our work on quality of peer production is that quality is created as an interplay between peer production of digital content and peer validation processes. Naturally peers have different roles at different times – they can participate in the quality process as creators, but their role is essential also as validators (see *picture 6).*



Picture 6: The QMPP Qualityscape

In peer creation there are different modes of work, which actualize on different times. The creation work can include authoring the content (such as making a new article or video), editing of the digital content (such as proof-reading), enriching the digital content (such as adding new information or new media) or updating the content (such as updating the existing content with contemporary data).

However, the key aspect in the quality management of peer production is the active and thorough peer validation work. The peer validation work can include benchmarking (comparing with other sources), peer reviews (systematically validating your content with other peers), peer reflection (reflecting the content with other peers) and peer learning (joint learning and mutual development through continuous assessment).

In the following table (see *table 6)* we have summarized some typical activities during in the peer creation – peer validation work.

Peer creation (including peer authoring)	creating digital learning content by authoring, editing, enriching and updating using various media
Authoring	(shared) authoring of texts and other digital resources; creating images, audio materials, video materials; creating content for wikis etc.
Editing	(shared) editing of digital content (from proof-reading to translation), creating alternative navigational routes, creating collages etc.
Enriching	creating additional digital content, publishing individual works and team works, sharing or learning (b)logs, adding library links, social bookmarking etc.
Updating	monitoring existing content, updating existing content, adding specific area content etc
Peer validation	validating digital content with subject matter experts, validating content with peers, rating the validity and usability of the content etc.
Benchmarking	identifying of good cases and practices for comparative purposes, identifying of additional digital resources, identifying areas of lacking content etc.
Peer reviews	providing feedback by peers of learning goals, progress and aims within a learning community
Peer reflection	encouraging the reflection of learning processes by means of own experiences and sharing the reflections within the learning community or between different learning communities
Peer learning	joint learning also by the exchange of learning experiences and learning outcomes, such as e-portfolios

Table 6: Peer creation and peer validation

Quality management of peer production of eLearning must also focus on providing enabling processes and enabling tools for those situations in which peer-created content shall be peer-validated. The enabling policies for peer creation, peer validation and quality management must thus support the entire process of Peer Creation and Peer Validation, by providing enabling tools and suggesting enabling processes.

Action point

You have now been acquainted with many aspects of quality management of peer production of eLearning and we have now presented you the QMPP Qualityscape model. According to your own organization, assess the QMPP Qualityscape – does it answer your situation? What should be added to the QMPP Qualityscape approach for it to serve your needs?

7.3 QMPP experiences and case studies

During the QMPP project we ran four different pilot projects. These pilot projects had all their specific nature as well as their methodology to work with the quality methodology. In the following we describe these pilots and their experiences.

Case study A: Manolo's Business Trip - IAVANTE[57]

Manolo's Business Trip is part of a peer produced, online, multi-level, English language course. It is a project of the IAVANTE English Training Program, which serves 200 students from all over the Andalusian Public Health System in Spain (APHS). This blog-based project was devised as a transversal strategy to adapt learning content to the specific language needs of the professionals who work in public health care as well as to address two additional factors. The first is the growing reliance on "Web 2.0" structures in the workplace of health professionals and therefore attraction to their use for training needs, and the second is to provide a continually stimulating environment in class cycles with no fixed ending points.

Manolo is the virtual protagonist of a series of episodes published on an open Wordpress blog using interactive Flash presentations. His character, represented by an avatar, is a flexible mixture between professional and personal (doctor, trainer, researcher, bon vivant, musician, etc) to facilitate adaptation to and incorporation of all the necessary language scenarios commonly required by a gamut of health professional positions: clinicians, health managers, medical researchers, administrative staff, IT personnel etc. A team of eight language-training consultants and teachers collaboratively created the initial episodes. These were tested in the classroom environment for didactic effectiveness and also as a means of introducing the concept in context to the students.

The following and current chapters are based on student peer process created avatar characters forming a community of friends, family, co-workers, and other tangent characters interacting with Manolo.

Each APHS student group (in average eight students per group) creates a single avatar to represent their class in the story. They decide their avatar's profile and relationship to Manolo and provide texts that are spoken by the avatar through recorded voice technology. Each group creates a dialogue between their character and Manolo.

Avatar profiles and dialogues are published in a separate category on the blog dedicated to student content. Student content is proofread by student group consensus moderated by the teacher and is posted as is, without additional editing or translation. Episode content is proofread and edited by a teacher peer process and accompanied by a translation.

Groups vote for their favourite avatar from among all the groups, excluding their own. The winning interaction is then prepared by the teaching team as the next episode in the story of Manolo's Business Trip. Additional student polls administered in class and on the blog decide what Manolo will do next.

[57] this case study has been authored by Tim McQuaid and David Riley (IAVANTE)

Students define the direction of class content through group consensus twice a year. They are responsible for contributing to class didactic material which is later housed in the Moodle platform. Periodically, students are asked to reassess the class direction and modify it to fit their evolving needs. Manolo's Business Trip episodes are adjusted to reflect these changes. In addition to determining class and blog content, each student creates an individual language goal specific to their personal language learning needs. Classmates receive and provide group support in their efforts to fulfil these goals.

Manolo's Business Trip material is produced for three levels – Basic, Intermediate and Advanced – and consists of a narrative based story followed by a question and answer section, language and grammar tips, an area providing translation practice, quiz possibilities and glossary. Language learning sections provide possibilities for audio, still images, texts as well as video options. Material from each episode is used in conjunction with face-to-face classes and participation in a Moodle platform. All texts and audio materials are downloadable.

A second feature of Manolo's Business Trip is the inclusion of peer production between the teachers administering the course. Teachers communicate through emails in a "forward to all" group system. Language and grammar content introduced in the narratives and following exercises is created through group consensus based on solicitudes from all teachers. Final validation of material is produced through a peer review followed by administrator approval. Teachers also have their own avatars, which are available for interaction with student created avatars in classroom creative scenarios.

A pilot group of eight advanced level students and three teachers provided feedback on Manolo's Business Trip. Pilot group students and teachers completed questionnaires on the principles for quality. Further peer validation processes are being defined.

Case study B: Hygiene passport - how to use the existing expertise in a cost-effective way[58]

Vocational education has a strong place in Finnish educational system. It gives both practical training and also basic academic skills, so after the vocational school one can still continue his/her studies for instance in higher education institutions. Vocational education is also attractive: more than half of the youngsters in the age of 16 choose the vocational education as their educational alternative. In addition to the education of the youngsters, vocational schools in Finland have strong professional training. Almost every vocational school in Finland has also an adult vocational training centre or institute.

The QMPP pilot took place in Jyväskylä Institute of Adult Education. Its main function is to provide initial and continuing vocational training and education for adults. It provides instruction to 6000 youth and to 12 000 adult students every year. It has also quite a long tradition in blended learning and using eLearning as a part of its learning provision. The use so far has been very curriculum-driven and teacher/trainer orientated, so the variation of the materials and courses have been very wide. With this QMPP pilot project a new content creation method, peer production based on expert/teacher collaboration, was introduced within the organization.

The most used method is teacher/expert content creation is a model, in which a group of teachers of the same subject area firstly agree about the curriculum's execution. This execution plan is then divided with the content creation group, and every member of the

[58] this case study has been authored by Petri Lounaskorpi (Finnish eLearning Centre)

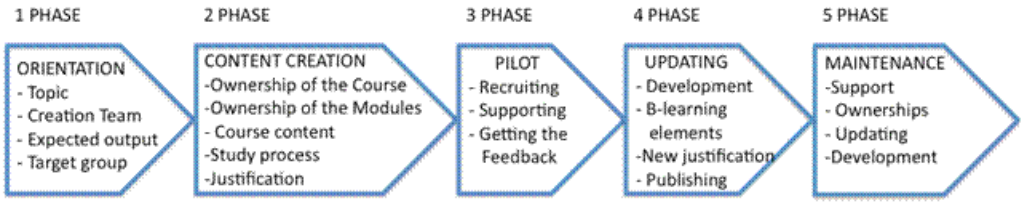
group will create one part of the agreed content. As one teacher/expert creates one concrete part of the curriculum, he/she gets the other parts buy other content creators in exchange. However, this model requires much codification and negotiation between the different teachers and experts.

The alternative method is to gather the experts as a group and then concentrate on one specific topic. The key agreement between the creation team is made about the learning process, the content and the evaluation of the learning aims. The team has to reach a mutual understanding of these aspects. The actual content creation process is then just amalgamating the materials of the various content creators together and organizing them into a right order. Hardest in this process is to expose the essential: the core information what the student need to achieve the learning goals. In the QMPP pilot the latter method used.

The topic of the QMPP pilot course was the "Hygienic passport". The demand for the Hygienic passport has been quickly increasing and it requires more and more workload for the expert teachers. The need of the Hygienic passport is included in the legislation both on national as well as on European level. Practically, this means that every person who is connected in their work somehow to food or drinks, needs this "licence"- the Hygienic passport. It is required from farmers, truck drivers, shop clerks, chefs, nurses etc. already working in their profession.

So far the courses have been held traditionally face-to-face teaching and after the course the learners have taken a test. The test is nationally coordinated with a questions database maintained by the Ministry of Social Affairs and Health. Only licensed teachers/trainers can correct the test and give out the Hygienic passport. In Jyväskylä there were four licensed teachers – and they were drowning to their work.

The content creation process was divided in five phases:



The functional quality of the training is linked with the actual topic of the training. The course content must fulfil the legislative and regulative requirements of the Hygienic passport. These objectives had to be achieved and there was also a clear testing mechanism available by the national exams. On the other hand, the content creation group of experts also automatically steers the quality with its work. If the content, learning process or other parts of the course doesn't please all the content creation team, they need to compromise and jointly agree how to maintain the high quality of the learning provision.

The feedback and the update phase after the piloting phase provides also an important step in the quality work. The development process must be seen as an ongoing process, which assists in the updating and renewing of the course.

The course production in a vocational educational institution is challenging. eLearning course creation is seldom seen as an investment. New ways of working are often interpreted as additional costs. The QMPP pilot's experiences according to the resources were that the person power required for good peer production was severely underestimated by the management of the institution. During the pilot, the experts spent

104 real working hours and the support staff (in assisting with the LMS etc.) another 112 working hours for the Hygienic passport course. This showed that good peer production must be well resourced and its nature as a method in content creation requires joint work by many different actors. However, the institute has now a permanent eLearning resource to widen its learning provision. Thus the key learning point of the QMPP pilot in Finland was that good and thorough peer production by experts must be provided with time resources.

The experiences of the training were excellent. All the students had access to the course either from their workplace or from their homes. The course structure was logical and all the students of the first cohort studied thoroughly the course – and all passed the required test.

Case Study C: Critical care advanced training course for nurses - peer production of eLearning content combined with advanced patient simulation at IAVANTE[59]

In the piloting of the QMPP approach,, the Granada Medical Simulation Centre of the IAVANTE Foundation has incorporated a Critical Care course using advanced simulation techniques combined with peer production of eLearning content in the training of expert professionals.

In Critical care course which the students – expert nurses - share their knowledge and experiences, but also develop the competences in practice. The piloting group consisted of seven nurses. They were expert professionals on Critical care, although working in different fields (organ donation, emergency etc). Furthermore, the support for the pilot consisted of a training coordinator and three facilitators for methodological aspects, technical skills and non-technical skills. The main outspoken objective of the course was to improve knowledge and skills in Critical care, and the specific objectives were set by the peer group itself.

There were two phases of the course:
- eLearning phase: the students (peers) produced all theoretical content and the content of the training sessions through peer production using an eLearning platform (Moodle). The content was divided into four main modules in Moodle, and the peers uploaded and discussed their deliverables (in the form of work sheets) divided for knowledge skills, technical skills, non-technical skills and clinical scenarios.
- Face-to-face learning phase: the face-to-face learning phase took place over a two-day period. A human patient simulator (advanced robot HPS METI™) was used in these simulations. The peer group adopted their acquired knowledge into practice in advanced simulation training (robotic and actor-based simulation). At the end of the course, the peer group entered the eLearning platform to share reflections about their own experiences.

The course was oriented to results and performance: in all 24 documents were uploaded into e-learning platform by peers. Documents covering knowledge skills and technical skills were produced by the peers as well as seven clinical cases were created by peers – these were implemented in clinical scenario simulations at the end of the training process. Moreover, the learners shared a high level of satisfaction, which was documented by questionnaires after the training.

Various eLearning 2.0 principles were implemented along the course. Self-assessment of own needs was very important in the first moments of the training. Reflection of the

[59] this case study has been authored by Jose Pinzon (IAVANTE)

learning as well as of the work practices was of key importance, and some aspects of the training methodology were defined by peer consensus.

As a conclusion of this QMPP pilot we can state that:
- Participants were free to create content. They agreed methodology and specific objectives at the beginning.
- Learning process promoted refection and learners as pro-active producers.
- The facilitator had a key role because of the novelty and features of peer production processes.
- All peers have produced content and have exchanged knowledge from their own fields.
- Created content is reusable for future courses as a modular content.
- Peer production enabled the sharing of tacit knowledge and put it into practice in a simulation scenario.

Case study D: Master Course in Educational Design at University of Macerata[60]

The Department of Education of University of Macerata (Italy) run a QMPP pilot within the Master Course in "Educational Design". The course was organized in collaboration with the following Italian institutions: University of Molise and the corporate IFOR (Istituto di Formazione Orientamento e Ricerca) located in Matera (Italy). This course was designed as a one year course (60 ECTS points) and it lasted from October 2008 to April 2009

The objective of the course was to provide in-service and future teachers with the proper competencies to be able to
- design learning paths which focus on authentic tasks, balanced assessment and the use of new technologies
- match the design phase with the educational research process
- build curricula for the different disciplines.

The Master course offered three different learning paths:
- Educational research
- Disciplinary curricula (Italian, Maths, English, History, Science)
- Instructional technology.

The participants were expected to be in-service school teachers of any level (from primary to high school level) and graduates whose degree allows them to start the school career.

The participants of the course were required to allocate a total amount of 1500 hours to the course and its activities – this consisted of:
- 12 hours of face-to-face instruction (at Faculty of Education – University of Macerata connected via videoconference either to IFOR or Faculty of Social Science – University of Molise)
- 375 hours of online activity (using an LMS and various "Web 2.0" applications)
- 300 hours of project work in the project work stage (to be agreed with the scientific committee; in-service teachers could ask to do their stage in the school they are working in)
- 813 hours of individual study work.

During the course different resources were be available and delivered via the LMS, such as

[60] this case study has been authored by Laura Fedeli (University of Macerata)

- web resources (links to websites, weblogs, wikis, articles etc.)
- materials prepared by both university professors and experts in the educational area coming from the school context (articles, case-studies, presentations)
- materials created by the participants during their activities; these materials serve as a resource to be accessed by all teachers of the current ongoing course as an input to foster reflection on personal habitus related to the design process as well as a resource to be used in future master courses

The method used in the Master course was a practice-theory-practice approach following the inputs theorized by Marguerite Altet, Philippe Perrenoud, François Tochon, Léopold Paquay and Shulman. The key activities – done partially in collaboration with the peer group - could be divided as follows:
- individual reflection process (through an e-portfolio)
- shared reflection and collaborative tasks in small group activities (chats, discussion in forum, collaborative production of reports)
- final project (personal presentation using a selection of tools).

Action point

You have now been acquainted four different case studies, in which peer production has been implemented in practice. Regarding your own organization, reflect in the following what were the key quality mechanisms in the cases. You should also discuss what were the key findings in the presented cases, which have an impact in your organization when implemented peer production in eLearning.

8 Build your own quality development approach

In this chapter we guide you in building a suitable quality approach to your organization to support the quality management of peer production of eLearning. As you have worked with the previous chapters, you have already made a number of definitions and set up a number of guidelines.

8.1 Assessing your concurrent practices

The first recommendable step is to assess your concurrent practices. The mapping of the existing situation provides you with an appropriate understanding of your practices, but it can also provide you ideas to improve your work in the quality area.

Action point

Use the following list to assess your concurrent practices. It has been formulated in order to give indication how peer production practice can become high quality peer production. Please go through the list and assess your own practice. You are encouraged to write into the right column if and how you have implemented the specific principle in your own practice.

Principles for design

Principles	How is this principle implemented in your own practice?
1. The peer production environment should be designed in a non restrictive way and should stimulate participants' creativity by giving suggestions rather than restrictive laws.	
2. Democratic design includes shared ownership of processes; focus on peer interaction, quality is then defined as the groups quality consensus.	
3. Pedagogical Design of learning environments should focus on openness and not limit the peer group up front, it	

should be participatory and strive for peer-agreement on objectives, methodologies (at the beginning).	
4. The design process should focus on consistency of each members level of input and positive interdependences between peers as well as complimentarily of the role of peers	
5. It is important that a code of practice for democratic design is existing which underpins the changed objectives of quality evaluation in peer-learning	
6. The educational design should be relevant to the professional context; the contents should be fresh and updated, should focus on a supportive context and relate to a real identified need.	
7. It needs a clear Purpose and ideological support in term of culture for working together, culture of continuous learning, culture of acceptance of errors, continuous improvement	

Principles for the process/ educational process

Principles	How is this principle implemented in your own practice?
1. The educational process needs to focus on both quality and motivation (internal / external)	
2. It should allow low external determination and high internal reflection	
3. Reflection is of key importance for learning 2.0 processes.	
4. Learning process should be open, however Users should be accountable and registered in order to be able to validate the contributors	

5. The learning process should promote learners as active producers rather than passive consumer, should follow the path from reception to participation and focus on interaction	

Principles for technology

Principles	How is this principle implemented in your own practice?
1. Functional quality is important: coherence of used tools, Technical support, User friendliness, testing and validating, Accessibility, Tutorials are available, traceability of production	
2. High contribution possibilities should be sidelined by highly accessible media	

Principles for organisation

Principles	How is this principle implemented in your own practice?
Peer Learning has to be economic, concepts reusable and an appropriate documentation should be available at all the stages	

Principles for outcomes

Principles	How is this principle implemented in your own practice?
1. Peer learning should be oriented to results.	
2. The learning should be based on established validation processes through the evaluation by peers, review committees for content and a peer review needs to be in place.	

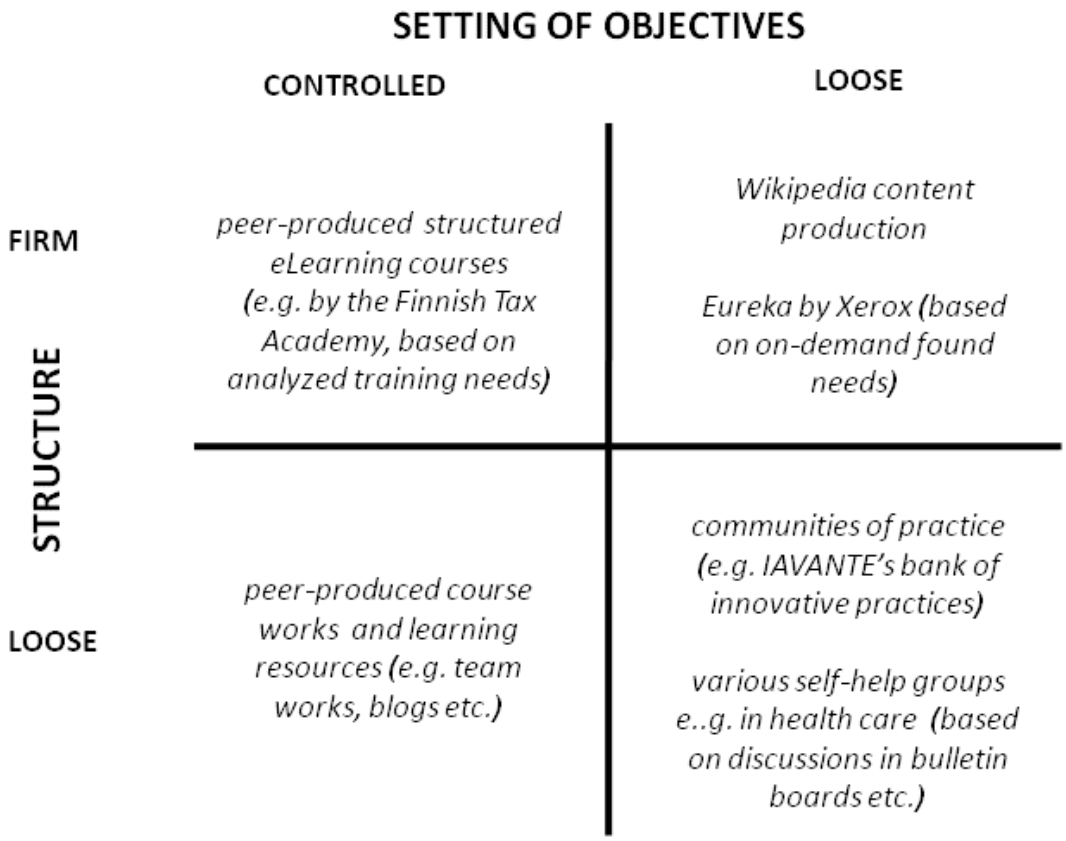
8.2 Developing and defining your quality approach

Although we would like to see quality management of peer production implemented quickly and widely throughout our organization, it is needed to understand that different modalities might require different aspects of emphasis.

Consider the case studies presented in the Handbook – they describe organizationally very different situations with different actors and different ambitions. Based on the cases presented, we can present a simple classification of the various critical dimensions of peer production in eLearning and related fields.

The two critical dimensions are (see *picture 7*):

- setting of objectives – who is setting the objectives for the peer-produced content: is it controlled and unified for all potential peer producers (e.g. a framework of a "course") or is it relatively loose (e.g. in Wikipedia authoring an article of my personal interest)
- structure – what structure is given: is the structure firm (e.g. composed of certain elements, tools and requirements) or the structure loose and not pre-defined (e.g. peers can use tools and structure of their own choice).



Picture 7: Setting of objectives vs. structure

Action point

In developing your quality approach, consider at least the following aspects:

Elements of the quality approach	**Your decisions**
Define your target audience and learners (also assess their abilities and readiness for peer production)	
Define your subject area (also assess whether it lends itself easily to peer production)	
Define the setting of objectives (is it controlled or loose) in your eLearning work	
Define the structure (is the structure firm or loose) in your eLearning work	
Define the tools and technologies to be used and available (are you providing the tools or are the learners free to any tools)	
Define the resources required (what resources are required – this should include manpower as well as other resources)	
Define support required (technical support, pedagogical support etc.)	
Other aspects, what	
Other aspects, what	

Other aspects, what	

8.3 Documenting your quality plan for peer production

After assessing your concurrent practices, developing and defining your quality approach, you should now document clearly your quality plan for peer production of eLearning in your organization.

We have described many elements for a quality approach by both presenting the QMPP Qualityscape as well as describing several practices based on real life case studies in chapters 3 and 7. Based on this background information, you should now start to define your quality measures for peer production of eLearning.

We propose that for your quality approach, you utilize the QMPP Qualityscape approach and the elementary areas in the Qualityscape. Thus you should pay attention to the following aspects:

- what measures are required to ensure quality of peer creation activities
- what measures are required to ensure quality of peer validation activities
- what measures are required to ensure the interplay of peer creation and peer validation
- what measures are required to ensure the use of enabling tools and processes
- what measures are required to ensure the support of enabling policies.

Action point

Following the QMPP Qualityscape (and based on your own experiences as well as the case studies we have presented) define the following aspects:

Quality measures	**Your decisions**
What measures are you taking in ensuring appropriate peer creation activities?	

What measures are you taking in ensuring appropriate peer validation activities?	
What measures are you taking in ensuring the interplay of peer creation and peer validation?	
What measures are you taking in ensuring appropriate enabling tools and processes?	
What measures are you taking in ensuring appropriate enabling policies?	

However, as we know, quality does not just “happen” – it needs to be planned and implemented by people working within the organization. Thus after defining the key elements of the quality plan, you should also define the roles and tasks for each of the persons involved in the quality work.

Key persons	**Roles and tasks**

And finally, as discussed already in the early stages of the QMPP Handbook, the approach in quality can be summarized with the PDCA acronym: Plan – Do – Check – Act. This suggests that we see quality development as a continuous activity. You have now defined the basic elements for your quality approach and quality measures for peer production of eLearning. You should also now define the actions for continuous improvement.

PDCA phases	**Actions**
Plan	
Do	
Check	
Act (improve)	

9 Recommended readings

We have collected to the following list of recommended readings such literature, which we have used in the text, but also such books, articles and web resources, which might interest you in getting a deeper understanding of the issues of peer production and quality management.

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