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eQNet
Quality Network for a European
Learning Resource Exchange
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# D.2.2.2
# State of the art report 2
# Public Report

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# Executive Summary

This updated annual report is primarily designed to inform the network of policy makers defining 'travel well' quality criteria but will be of value to repository owners and other content stakeholders outside the project. It will review major projects and initiatives working on quality criteria for educational repositories/content (e.g. OPAL) as well as how work from relevant standards and licensing bodies (IMS, CEN/ISSS, Creative Commons etc.) impact on eQNet quality criteria.

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# 1 Introduction

The European Schoolnet Learning Resource Exchange was set up to provide Ministries of Education (MoE) with access to a network of learning content repositories and associated tools that allow them to more easily exchange high quality learning resources that 'travel well' and can be used by teachers in different countries.

At the start of the eQNet project, the LRE development was being steered by MoE in a LRE Working Group that was set up in September 2008 as a first step towards developing a long-term LRE sustainability strategy.

During its May 2010 meeting, MoE in the EUN Steering Committee decided to formally establish a new EUN Subcommittee to take forward the work of the existing LRE Working Group and put the LRE development on a more secure financial footing. A new governance model for the new LRE Subcommittee was also adopted in which:

- The LRE is seen an *ongoing* EUN 'project', the aim of which is to provide a stable, public service for schools
- The LRE is open to other stakeholders, including regional educational authorities, ICT vendors and other stakeholders, but is still driven by MoE.
- A voting system enables MoE to remain in control of the LRE initiative.
- A new funding model, based on an annual membership fee, ensures the sustainability of the LRE.

The second version of this report, therefore, represents an important instrument for MoE in the LRE Subcommittee (nine countries are currently participating) and will also be of value to new LRE Associate Partners (including regional educational authorities and ICT vendors) that will be invited to join the LRE Subcommittee in 2011.

# 2 Previous projects and findings

The “travel well” concept has been addressed in several previous projects: the European projects CALIBRATE (2005-08) and MELT (2006-09), and the Open Educational Resources Teacher Network (OERTN) funded by the Hewlett Foundation (2008-10) described in deliverable 2.2.1.

# 3 OER quality standards

### The Open Educational Quality Initiative (OPAL)

eQNet is closely following the evolution and activities of the "Open Educational Quality Initiative,"[1] an international network "to promote innovation and better quality in education and training through the use of open educational resources." The OPAL Initiative is a pan-EU partnership between seven organizations including the ICDE, UNESCO, European Foundation for Quality, the Open University UK, Aalto University and the Catholic University Portugal. It is led by the University of Duisburg-Essen, Germany and partly funded by the European Commission."

The OPAL Initiative sees the potential of OER to transform teaching and learning by stimulating innovation in pedagogical practices. Thus, OPAL is committed to moving beyond the issue of access to open educational resources (OER), and focuses on innovation and quality through open educational practices (OEP). A central component of OPAL is a commitment to "strive for better quality and to innovate educational scenarios through the use of OER, so that we can move from resources to practices" and the continuous refinement of these practices with the collaboration of multiple institutions. (OPAL, 2011a)

Eight categories for Open Educational Practices' categories were derived from a review of 58 case studies of Open Educational Resource initiatives. The categories were derived from common themes across the case studies. (OPAL, 2011b)

The eight Open Educational Practices are:

- Strategies and policies
- Quality Assurance models
- Partnership models
- Tools and tool practices
- Innovations
- Skills' development and support
- Business models/sustainability strategies
- Barriers and success factors

OPAL's review of Quality Assurance Models found that,

> A range of Quality Assurance (QA) models was evident across the case studies. These depended on a number of factors; the type of institution and their learning and teaching culture, the balance of importance of the 'value' of teaching (in comparison to research activities in the institution), the degree to which OER activities were seen as research activities in their own right, the

[1] http://oer-quality.org/

level of e-learning maturity of the institution and the extent to which they had engaged with OER work previously.

QA models range from lightweight, user-defined models to strictly controlled hierarchical models. An example of a lightweight and user-driven model came from the Southampton University case study and their EdShare project. They provided the option of either open-web sharing or institution-only sharing, according to academics wishes. The OER are made available as simple assets (such as PowerPoint, Word, PDF files); i.e. standard formats that academics are used to producing in their everyday practice. In terms of QA and adherence to standards, this is very much a lightweight approach; no adherence to IMS content packaging or LOM is required.

OpenExeter is another example of quality control driven by academics, although interestingly it does adhere to IMS standards and is SCORM compliant. It is interesting to note that Southampton and Exeter universities would both view themselves as 'research-focused' institutions, where the academic view is still privileged; hence such lightweight, academic-driven approaches are to be expected. In fact, this does appears to be quite a common approach adopted by many of the case studies; certainly some of the more recent, smaller initiatives.

In contrast to these lightweight models, the OpenLearn initiative from the Open University in the UK is a good example of a top-down controlled QA model, with clearly articulated quality processes and identified roles (authors, editors, technical support, quality assurers, etc.). Again this can be seen as both a consequence of the unique position of the OU in the UK as a large-scale distance educational institution (which a well established, Fordish-production model for course production and presentation) and due to the fact the project received considerable funding from the Hewlett Foundation for OpenLearn and hence was in a better position to set up more rigorous and complex roles and processes.

Other case studies can be seen as examples along a spectrum from lightweight to more controlled QA models and a number of examples of the QA practices are evident from across the case studies. These practices include: the use of peer-reviewing as a means of assuring quality (for example in the Gitta project); defining criteria for peer-production and open content (the AVO project); and more organic and community peer-review based and relatively linear quality assurance models where quality assurance checks and processes are embedded into the workflow for production of OER, annotation through experts which help the users through the learning materials, multi-level reviews, or reviews against a set of pre-defined criteria.

An example of a relatively linear quality assurance models is the OpenER project from the Open University of the Netherlands, where authors are required to produce and submit content, which is then checked, converted and rechecked. EducaNext is an example of a more organic, community-based

> model, where members are able to comment on published content or run a complete course evaluation. KELDAmed is another example, which includes annotation by experts, who then also are available to help the users through the learning materials.
>
> CampusContent have multi-level reviews where experts review the material and then learners can further improve shared understanding of the OER through their own annotations. Podcampus is an interesting example of a lightweight QA model, where contributions are provide from experts. Another community-based model can be seen in the CCCOER/CCOT initiative enables educators to share reviews of materials and also look at and comment on the reviews of others. The CCOT reviews are done against a set of pre-defined criteria. These include sub-dimensions around: accuracy, importance or significance, pedagogical effectiveness, completeness of documentation, ease of use for teachers and learners, inspirational/motivational for learners, robustness as a digital resource. Another interesting model is that adopted by eLibrary, which involved multiple stakeholders, who can contribute to both the development and improvement of the resources in a variety of different ways. (OPAL, 2011b)

Of the 58 case studies collected by OPAL (OPAL 2011c), of particular interest to eQNet is the OER creation framework and supporting quality criteria proposed by the OTTER project at the University of Leicester – funded by JISC and the Higher Education Academy (UK). OTTER supports the transformation of teaching materials into OERs by academics. In support of this work OTTER developed a Content, Openness, Reuse/Repurpose, and Evidence (CORRE) framework using "a 'progressive and cumulative' quality criteria, as opposed to a single set of criteria applied at the end of the process." Teaching material that is a candidate for becoming an OER "must move from left to right to meet the criteria associated with each stage of CORRE" and each stages incorporates all the criteria from previous stages. (OTTER, 2010)

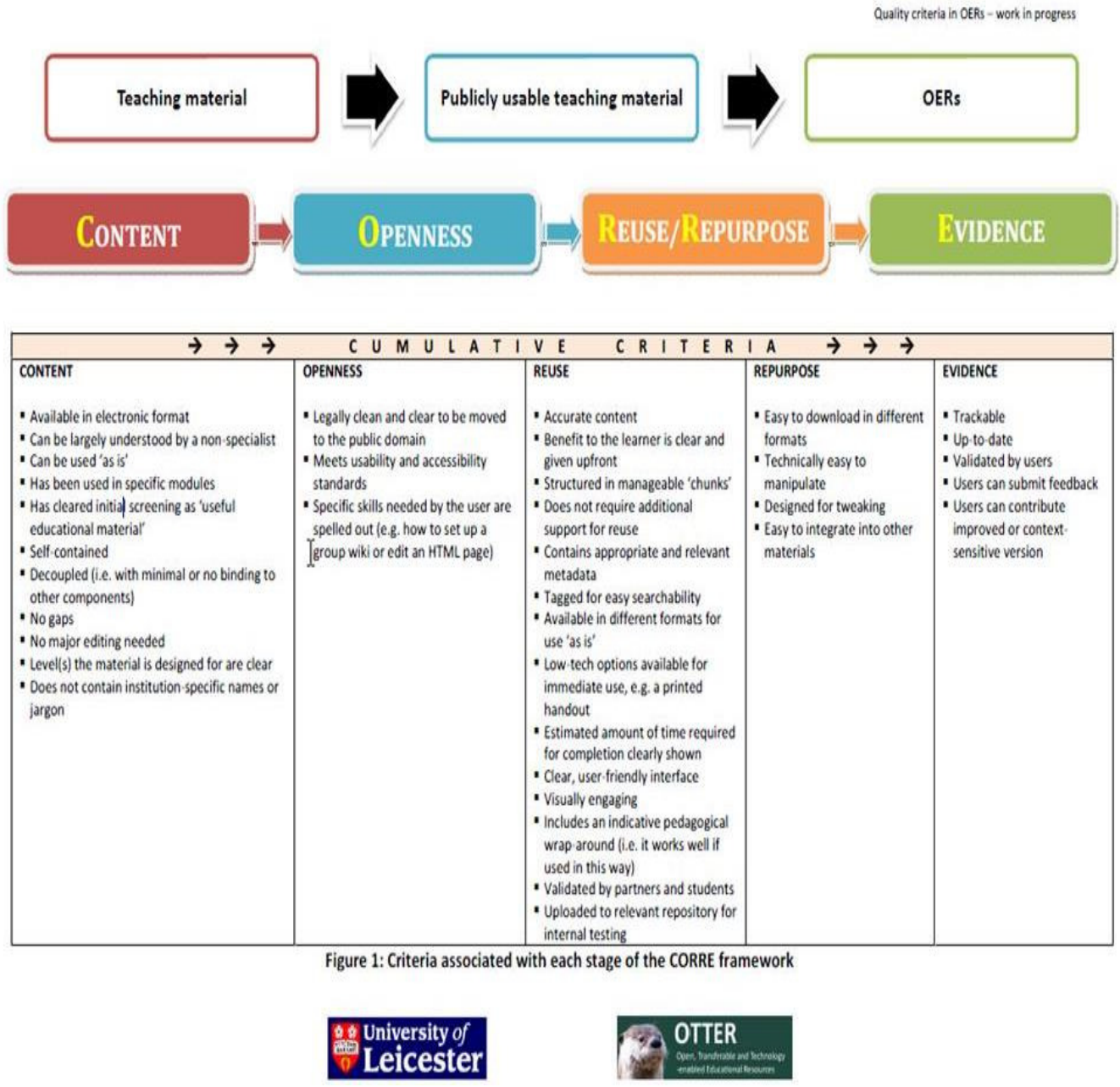


*Figure 1: CORRE Quality Criteria for OER (OTTER, 2010)*

# 4 Impact of content standards on eQNet quality criteria

For eQNet it is also important to take into account the work of relevant standards and licensing bodies, e.g. IMS, CEN ICT, Learning Registry (U.S.) and National Science Digital Library (U.S).

## *4.1 IMS Learning Object Discover and Exchange Specification*

Work on the IMS Learning Object Discovery & Exchange (LODE) specification is nearing completion. IMS LODE aims to facilitate the discovery and retrieval of learning objects stored across more than one collection. It can be seen as a 'glue' specification that profiles existing general-purpose protocols in order to take into account requirements specific to the educational domain, rather than creating new protocols. It proposes three main data models:

- A LODE Context Set for the Contextual Query Language (CQL): a data model for the attributes of learning objects, which can be used for search by expressing educationally meaningful queries;
- A data model, named Information for Learning Object eXchange (ILOX), that organizes sets of metadata on learning objects to be used in data exchange; and
- A data model, named Learning Object Repository Registry Data Model, for learning object collections, to be used in discovering and configuring access to those collections.

Using ILOX efficiently addresses the requirements associated with federating sets of metadata originating from various origins, with content provided by ministries of education (MoE), commercial and non-profit content providers, and cultural heritage organizations. A rapid rise in the production and dissemination of complex learning objects (in multiple languages, in multiple formats, in multiple locations, tailored for particular populations and dedicated platforms) necessitates a more precise way to indicate which aspect of the object is being described in a single metadata record.

The challenge is to describe this information in one metadata record, provide users with an ability to discover the version and format of this learning object that meets their needs and to evaluate the objects suitability with the help of recommendation systems. By providing mechanisms to attach multiple metadata schemes in one record. ILOX overcomes the limitations of a reliance on a single metadata specification such as IEEE LOM without undermining interoperability and backward compatibility as needs and requirements continue to evolve.

Of particular relevance for eQNet are the solutions provided for ILOX in supporting the discoverability of quality content and its ability to support the aggregation and exchange of information generated by implicit and explicit user actions. The generation of metadata about learning objects is no longer within the strict purview

of the objects' creators and trained indexers. The ascent of social networking cultures has created opportunities and expectations that users and networked communities of practice will generate and trust social metadata to guide their choices about services and products, including learning objects. Such user-generated comments, bookmarks and other types of evaluations are producing valuable streams of information for building recommendation systems, structuring search result rankings and feedback channels for content creators. Current metadata specifications used in the e-learning domain such as Dublin Core and IEEE LOM do not allow for the capture, aggregation and dissemination of social metadata without undermining interoperability. Using ILOX makes it possible to attach social metadata alongside other descriptive metadata in one record because ILOX is a glue specification. All participants in the LRE federation (i.e. users, content providers and portal managers) will benefit if such social metadata can be captured, aggregated and transported in a single metadata container with all relevant available information about a learning object for use in multiple contexts. Efforts to develop an information model to capture this information, so that it can be attached in an ILOX record, are underway and are described below.

## *4.2 CEN ICT Social Metadata*

Collaborative work has begun to specify an interoperable and flexible way of describing social metadata. An unfunded CEN WS-LT working group on "An information model (and its XML binding) for capturing information about the perceived quality and (re)-usability of learning objects", established a consensus between several European projects (ROLE, ASPECT, ICOPER, Organic.Edunet, Edurep, OpenScout, Natural Europe, MACE, dataTEL, etc.) on the necessity to develop a common way of representing and storing "social metadata" and the most important use cases that need to be addressed in future funded work.

The ability to capture and aggregate social metadata will provide for better services for end users such as recommendation and personalization systems as well useful information for content authors on the uses of their resources and their quality. This "social metadata" is information explicitly and implicitly generated by end users of learning environments. It includes implicit actions generating contextual information such as computing context, location, social context, environment, time, etc., as well as information generated by explicit activities of users such as ratings, bookmarks, reviews, etc. This work will specify a modular and extensible information model (and respective data binding schemas) that aims to capture: the users' foci of attention on different applications and resources, i.e. so called attention metadata and values for ratings, comments, tags, etc. The work will also involve building at least two reference implementations of LORs that support this specification.

Important issues are yet to be resolved such as unique IDs for users and item across systems, data privacy legislations, juridical implications, etc. Thus, part of this work will investigate privacy issues for learners and data set providers, anonymisation practices, i.e. guidelines describing which data is safe to expose. Additionally, best

practices for approaches for secure access and storage will be collected and made accessible, eventually contributing to the final information model mentioned above.

eQNet will follow this work given that it will enable new types of analytics:

- Reflecting on learner's study behavior (i.e. self-directed learning support and reflection);
- Contributing to the grading process of learning activities and results;
- Providing insights into individual learning behavior expressed through learning activities.
- Capturing and storing intentionally expressed opinions about learning resources;
- Providing support for teachers when designing and carrying out their courses
- Providing individual support for learners (through immediate feedback as in self-reflected learning) on their learning performance

This work is building on work already completed and work in progress:

- IMS LODE ILOX specification (under the auspices of the ASPECT project) designed to work as a wrapper for exchanging social metadata.
- The initial version, developed in ORGANIC.EDUNET, of a schema that allows for exchanging/reusing such information among repositories.
- Contextualized Attention Metadata (CAM) used in Ariadne, OpenScout, NaturalEurope, ROLE, ALOE and MACE that allows capturing activities concerning all entities within an application: learning resources, users, groups and collections. It is used to create a feedback loop that enables analysis of the way people actually use new technologies and tools for learning.
- The Social Metadata Broker (SMB) model that is employed in the Netherlands in Edurep.
- The Learning Registry in the USA makes federal learning resources easier to find, easier to access and easier to integrate into learning environments wherever they are stored - around the country and the world. This initiative is also supporting the development of information model that can capture and store "paradata" which is synonymous to "social metadata". Initiatives surrounding The Learning Registry are described below.

## *4.3 Learning Registry*

The Learning Registry project is an informal collaboration among several United States federal agencies committed to making learning resources created by U.S. federal agencies discoverable and accessible to enable all stakeholders in the education domain to "build and access better more interconnected and personalized learning solutions needed for a 21st-century education."

The key members of the Learning Registry are The Advanced Distributed Learning Initiative (ADL) from Office of the Under Secretary of Defense for Personnel and Readiness (OUSD P&R) and The Office of Educational Technology at the US

Department of Education. This work is built upon a collaborative framework that includes U.S. based institutions such as the National Science Foundation and the White House Office of Science and Technology, as well as international collaborators, including European Schoolnet and Education Services Australia, and the UK Joint Information Systems Committee (JISC) among others.

While this work is still in progress, a Technical Specification has been published in draft form. The technical specification "defines a learning resource distribution network model and a set of open APIs and open interoperability standards to provide three fundamental, enabling capabilities:

1. a lightweight mechanism to publish (push) learning resources (or metadata or paradata describing the resources) into a learning resource distribution network, independent of format or data type (e.g., resource, metadata or paradata);
2. the ability for anyone to consume the published data and then, in turn, to publish additional feedback about the resources' use into the network (e.g., additional paradata), amplifying the overall knowledge about the resources;
3. a high-latency, loosely connected network of master-master synchronizing brokers distributing resources, metadata and paradata.

There is no central control, central registries or central repositories in the core resource distribution network. Published data can eventually flow to all nodes in the network. The network aims to be self assembling. Edge services can connect to any distribution node to find out what resources (and resource sources) are in the network, what's changed, what's being used, etc. Organizations may build consumer-facing, value-added services at the edge nodes to enable using, finding, sharing, and amplifying the resources, metadata and paradata for user communities. The Learning Registry provides *social networking for metadata* (trusted social collaboration around learning resources), enabling a *learning layer* on the social web". (Learning Registry Technical Specification, 2011)

## *4.4 National Science Digital Library (NSDL) – STEM Exchange Initiative*

In a parallel development with the work carried out in the unfunded work item in the CEN WS-LT working group, the NSDL Stem Exchange program in the United States has developed a technical schema and framework for generating and sharing paradata records across resource developers, aggregators and user platforms. The term "paradata" is equivalent to the way "social data" is defined in the CEN work described above.

The EUN has participated in the evolution of this information model as an outgrowth of their participation in the development of the Learning Registry (see above).

This work was undertaken to distinguish between descriptive metadata generated by LOs authors/ content providers and

> Dynamic information about digital learning objects that is generated as they are used, reused, adapted, contextualized, favorited, tweeted, retweeted, shared…In this context, paradata captures the user activity related to the resource that helps to elucidate its potential educational utility. (STEM, 2011)

This activity is intended to "complement metadata rather than replace it" and will result in the ability to create a "separate layer" of information, use social networking tools to automate the generation of information about a LO, and "accommodate expert and user-generated knowledge" among other objectives and thus create opportunities:

1. visualize a resource at the center of its own social-style network of activity
2. explicates usage patterns and inferred utility of resources
3. map network connections as teacher communities add multidirectional flows of information
4. create persistent, short references to resources
5. aggregate activity around the resource through user-friendly practices, such as hashtagging
6. power feedback loops with teacher communities (STEM, 2011)

## *4.5 Creative Commons*

As indicated in the first version of this deliverable, the *Defining Noncommercial* study carried out by Creative Commons in 2009 did not produce the clarity on the NC option that many stakeholders had hoped. Throughout 2010, eQNet has continued to monitor issues related to the application of the Non-Commercial option in the Creative Commons licensing scheme but, at the time of writing this deliverable, Creative Commons has not issued further guidelines or best practices related to this issue.

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