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1. Publishable summary

Introduction

All across the world the structures and control mechanisms of publicly funded research projects have changed dramatically in the last decade. There are many widely discussed causes of these developments. The set of causes on which we concentrate here is based on the evocation of the “ability to compete internationally” – a request that is expressed vis-à-vis national research landscapes in Europe as well as the European Research Area.

A metaphor that either explicitly used or implicitly resonates in the existing discourses, in the decisions on new governance mechanisms, and in new modes of research funding is *quality*. The discovery, improvement and promotion of research quality are the driving motives for the tendency to re-evaluate and redevelop structures for the research area, for redesigning the funding of research institutions and projects, and for instituting control and legitimization systems that are (or intend or pretend to be) helpful for decision-makers.

In the framework of these developments the questions of *how quality is interpreted* and *how it is measured* are of fundamental importance. Analyses dealing with this question supplied the starting point for the development of the research project “European Educational Research Quality Indicators (EERQI)“.

Traditional methods of assessing quality of scientific publications highly depend on ranking methods according to citation frequency and journal impact factors.

The central quality criterion that is used in these instruments is “international visibility” of research findings. This is expressed by the placement of the publication in journals with a good reputation and by the number of citations of a publication. This approach is characteristic of many proceedings, e.g. of the Social Science Citation Index (SSCI), a commercial instrument, owned by the US publishing group Thomson Reuter.

As yet, the most widely used approaches to quality assessment do not produce valid information in the sense they pretend to do, because the assumed international relevancy of the included publications cannot be proven. As can be shown by exemplary analysis of the SSCI, the rankings are heavily biased: they essentially refer to US or UK publications and publications written in English. International visibility as a quality criterion must be translated here to: visibility of products from a selection of national research spaces to the rest of the world. The provided information is perfectly suitable to substantiate the dominance of a ‘minority’ of regional and linguistic research areas.

This means in fact, that these methodologies do not reflect an adequate coverage of European scientific publications, in particular in the social sciences and humanities. Hence, if European

science or institutions are exposed to these evaluation methods, not only individual researchers and institutions are widely ignored, but also complete subject domains and language areas.

The initiators of the EERQI project, the research community as well as relevant stake holders from other spheres such as publishing houses, research funding and political decision making recognized the need to remedy the inadequacies of this situation.

The EERQI Project

The general intention of the EERQI project was to contribute to possible alternatives for the assessment of quality and thus reflecting more adequately the European context.

The application of these methodologies should meet two aims:

- a) it should raise the transparency and quality of the process of quality detection itself;
- b) it should make the task better manageable and less time consuming.

One important motive for the development of the EERQI project was the fact that the above mentioned methodologies of quality assessment show their inadequacy especially with respect to the specific features of research and knowledge production in the social sciences and humanities (SSH). The discipline of educational research can serve as a model case for research in SSH. This is justified as follows: education science and research combine a wide spectrum of theoretical and methodological approaches – from primarily philosophical-historical methodologies as used in the humanities to psychologically or sociologically based empirical observations of individual development, education, training or *Bildung*; from hermeneutical interpretation and single case studies to the generation and statistical analysis of great amounts of survey data. This manifests relevant characteristics of knowledge production which are also found in other disciplines in the Social Sciences and Humanities.

In order to meet the above mentioned aims, EERQI's objective was *not* to develop one single method, such as an index. The aim was the development and testing of a *set of tools* that can support and accompany the process of detecting research quality in texts. The set of tools we developed is what we call the

EERQI Prototype Framework

The EERQI Prototype Framework is based on the products that were developed in the course of the project and completed in the second reporting period:

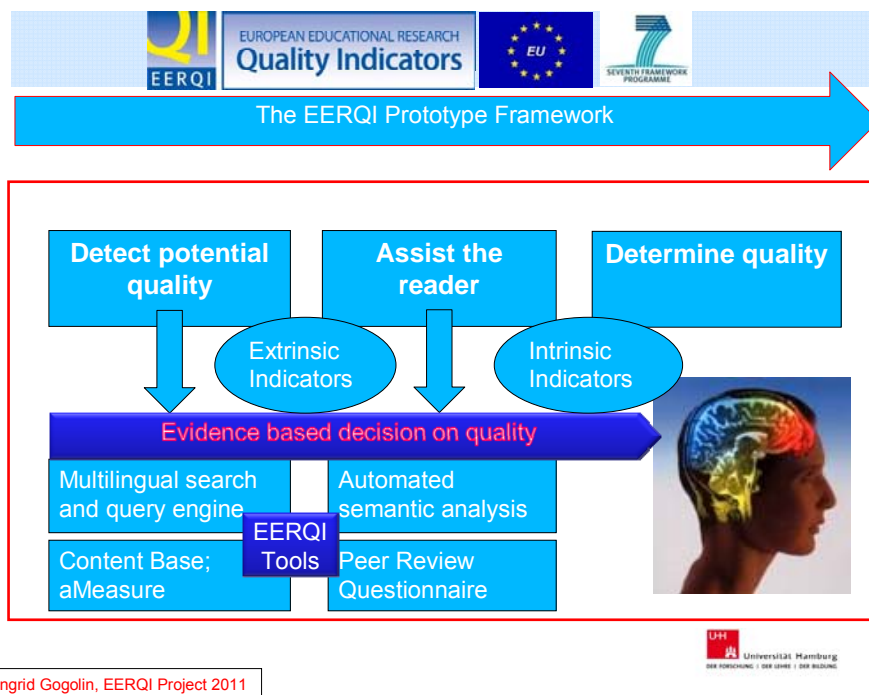
- **a content base** with educational research texts in the four European languages that were included in the EERQI project as examples: English, German, French

and Swedish.

- **a multilingual search engine** that includes query expansion: an effective tool dedicated to educational research in general, capable of finding educational research texts in the web in the 4 EERQI languages.
- **automatic semantic analysis for the detection of key sentences in a text**; the method is applicable to educational research publications (in at least) the four EERQI languages.
- **a combination of bibliometric/ webometric approaches for the detection of 'extrinsic' quality indicators** (tool aMeasure).
- **first tests of a citation analysis method** that has the potential to be further developed for the application to educational research (and other SSH) texts.
- **a set of text-immanent (intrinsic) indicators** for the detection of quality in educational research publications that has been presented to the research community and was positively evaluated.
- **an accompanying peer review questionnaire** that was tested for reliability and practicality.
- **a set of use case-scenarios** that advice on how to use which resp. combination of the above mentioned tools.
- First attempts to detect interrelations between 'extrinsic' and 'intrinsic' quality indicators.

All products will be made public via different communication tools: the EERQI web site (www.eerqi.eu) as well as publications and presentations to the relevant research communities, research funding agencies and other decision makers.

Figure 1: The EERQI Prototype Framework



The EERQI Prototype Framework is a set of indicators and tools that can be used during the process of quality detection. After detecting and identifying relevant texts (part 1) the new indicators of quality can be applied (part 2, 3, 4). The EERQI project identified two different types of indicators: one type that is external to the text, such as bibliometric and webometric features; and another type that is internal in the text – namely the signals that are given within the words, graphs, metaphors of which the text is composed. The process of quality detection can be illustrated as follows:

- **Part 1** is the detection of potential quality via the *identification* of relevant educational research texts in different sources: the EERQI content base (educational research texts provided by the EERQI publisher partners) and through the multilingual search and query engine.
- **Part 2** is the application of ‘aMeasure’ (developed by the EERQI partner Humboldt University). ‘aMeasure’ is a stack of tools and programs to measure extrinsic characteristics of research publications (such as citations, webmentions) by using Google Scholar, Google Web Search, MetaGer, LibraryThing, Connotea, Mendeley, and citeulike. In the context of the EERQI project ‘aMeasure’ was used to collect information about *extrinsic indicators* of quality of educational research publications.
- **Part 3** is the application of linguistic technology in order to provide automatic support for evaluating the quality of a text. The method developed in EERQI allows for the automatic

identification of key sentences to indicate parts of documents to which peer reviewers should pay particular attention (automated semantic analysis).

- **Part 4** is the application of a questionnaire (Peer Review Questionnaire) that contains a tested version of operationalization of the intrinsic indicators that were developed by the EERQI project.

The elements of the EERQI Prototype Framework can either be applied as single methods for specific parts of an assessment process; or they can be applied consecutively, leading to a final judgment on the basis of intense reading of selected texts.

Conclusion

The approaches that were generated and tested in the EERQI project open up a prospect for future developments that can meet the practical needs of accelerating assessment processes and make them better manageable as well as more transparent. Both is necessary not least because the number and aspiration of such processes are continuously growing. The intelligent combination of qualitative and quantitative approaches and the multilingual functionalities of the EERQI products open up the following vision: sets of tools can be made available that allow for well informed, evidence based judgments on research quality in SSH research. The set of tools that are presented to the public now can help educational (and other SSH) researchers to collect evidence for their quality assessments:

- **The search engine** – which returns educational literature in several languages using multilingual query and query extension;
- **aMeasure** – which provides usage data;
- **the Peer Review Questionnaire** – which has shown validity, usability and acceptance of the EERQI's intrinsic criteria of quality;
- **semantic analysis** – which highlights key sentences and provides reading assistance for peer reviewers.

The approaches that were developed and tested show precious possibilities to value Europe's multicultural and multilingual heritage in research. At the same time, they open up access to research that is published in different languages which a single researcher would not necessarily be able to understand or speak. The further development of the approaches that have been prototypically invented and tested in the EERQI project is thus not only a tangible result of a research project, but also a promising contribution to the general policy strategies for the promotion of cultural diversity and multilingualism in Europe.

2. Core of the report for the period: Project objectives, work progress and achievements, project management

2.1. Project objectives for the period

The overall result of the EERQI project, completed in the 2nd Reporting Period, is the development of the EERQI Prototype Framework for the support of quality detection in educational research texts.

A preliminary version of the Prototype Framework was presented to the public and discussed during EERQI's Second Workshop (Geneva, 09/2010, see WP 10). The final version was presented and discussed at the EERQI Final Conference (Brussels, 03/2011, see WP 13; see also posters and presentations on www.eerqi.eu). The Framework will be available online via the EERQI-website www.eerqi.eu. It will be made public via different communication tools: publications and presentations to the relevant research communities, research funding agencies and other decision makers.

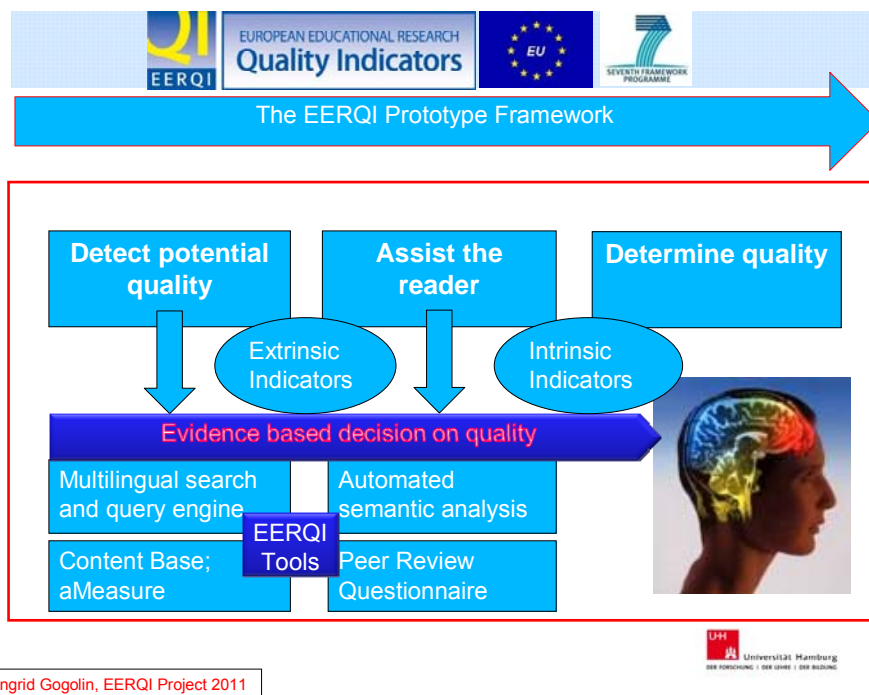
The EERQI Prototype Framework is based on the following products that were developed in the course of the project:

- A content base with educational research texts in the four European languages that were exemplarily included in the EERQI project: English, German, French and Swedish (WP1, 5).
- A multilingual search engine that includes query expansion: an effective tool dedicated to educational research in general, capable of finding educational research texts in the web in different languages (WP5, 6, 8, 9).
- Automatic semantic analysis for the detection of key sentences in a text; the method is applicable to educational research publications (in at least) the four EERQI languages (WP8, 9).
- A combination of bibliometric/ webometric approaches for the detection of 'extrinsic' quality indicators (tool aMeasure) (WP6).
- First tests of a citation analysis method (scientometrics) that has the potential to be further developed for the application to educational research (and other SSH) texts (WP8).
- A set of intrinsic (= text-immanent) indicators for the detection of quality in educational research publications that has been presented to the research community and was positively evaluated (WP4, 10).
- An accompanying peer review questionnaire with an operationalization of the intrinsic

indicators that was tested for reliability and practicality (WP4, 10).

- A set of use case-scenarios that advice how to use an intelligent combination of the above mentioned tools that is appropriate for a given assessment task or process (WP6).
- First attempts to detect interrelations between ‘extrinsic’ and ‘intrinsic’ quality indicators (WP4, 6).

Figure 1: The EERQI Prototype Framework



The EERQI Prototype Framework is a set of tools that can be used during the process of quality detection.

- **Part 1** is the detection of potential quality via identification of relevant educational research texts in different sources with the help of the EERQI content base (educational research texts provided by the EERQI publisher partners) and the multilingual search and query engine.
- **Part 2** is the application of ‘aMeasure’ (developed by EERQI partner HU-Berlin). ‘aMeasure’ is a stack of tools and programs to measure extrinsic characteristics of research publications (such as citations, webmentions) by using Google Scholar, Google Web Search, MetaGer, LibraryThing, Connotea, Mendeley, and citeulike. In the context of

the EERQI project 'aMeasure' was used to collect information about extrinsic indicators of quality of educational research publications.

- **Part 3** is the application of linguistic technology in order to provide automatic support for evaluating the quality of a text. The method developed in EERQI allows for the automatic identification of key sentences to indicate parts of documents to which peer reviewers should pay particular attention (Automated semantic analysis).
- **Part 4** is the application of a questionnaire (Peer Review Questionnaire) that contains a tested version of operationalization of the intrinsic indicators that were developed by the EERQI project.

The elements of the EERQI Prototype Framework can either be applied as single methods for specific parts of an assessment process; or they can be applied consecutively, leading to a final judgment on the basis of intense reading of selected texts. In the latter case, the parts of the framework can take over filter (or selection) functions in the assessment process. Part 1 is the identification of a text (or a number of texts) according to the relevance in principle for the given task; the multilingual search and query engine supports this part. Part 2 is the identification of a possible impact of the text(s) via the application of extrinsic indicators. Part 3 is the assistance of a reader by highlighting salient sentences that provide textual evidence for peer reviewers in their evaluation. Part 4 (supported by the EERQI Peer Review Questionnaire) leads to a final judgment based on reading selected texts and applying the above mentioned intrinsic indicators that were developed and tested by EERQI with respect to their validity and acceptance by the educational research community.

2.2. Work progress and achievements during the period

Work Package 1: Content Aggregation
Summary of Progress
<p>In this work package full texts and respective metadata were continuously aggregated from diverse sources in order to construct a content base of educational research documents. These sources (deriving from publishers, research institutions, Open Access and Internet sources) were identified and made available with the help of the EERQI Partners. Furthermore, a specified environment was developed for the data in this content base that reflects the technical purposes of experimenting and testing. The partners provided expertise with respect to the selection of important publications in the educational sciences sector, the identification of repositories and other sources of information that was relevant for the content base.</p>
<p><u>Technical Coordination</u></p> <p>HU-Berlin took over the technical coordination and provided expertise for technical issues related to the aggregation of educational research full text documents and meta data. The partner provided the concept and coordination for the development of the federated content base from an IT point of view and was responsible for the maintenance of the data server.</p>
<p><u>Aggregation of Content</u></p> <p>DIPF contributed to the EERQI content base with own resources from its database “German Education Index” by providing metadata (15,000 records) and a list of 17,000 open source documents. They commented and evaluated the texts delivered by publishers and gave access to relevant metadata.</p> <p>UHambDE supported the aggregation and continuous update of full texts and metadata from the participating publishers, research institutions, open access and other internet resources. Furthermore, UHambDE contributed by contacting German publishing houses which are important for educational research (Barbara Budrich, Waxmann). Both publishers could be won for the delivery of data for the content base as well as for cooperation in the project.</p> <p>IRDP and SSRE supported by contacting French editors (La collection Exploration de la Société Suisse pour la Recherche en Éducation, publié auprès de Peter Lang, Berne, Suisse; La Revue internationale d'éducation Sèvres, France; Les collections Cahiers de recherche en éducation et</p>

Work Package 1: Content Aggregation

Carnets de recherche en éducation de l'Université de Genève [FAPSE], Suisse; L'Unité de recherche pour le pilotage des systèmes pédagogiques [URSP], Lausanne, Suisse; La Revue des sciences de l'éducation, diffusée par le consortium Érudit, Montréal, Québec, Canada). Furthermore, both partners searched relevant texts in French for the content base (via the Internet and by contacting researchers) and delivered metadata for about 1500 articles. The partners undertook the selection of French language articles published in 2006 in the most important French scientific journals and negotiated with the journals to get them free of charge for the scientific use within the project.

UmU supported the content aggregation by identifying Swedish key educational resources and publishers and by providing Swedish translations of search concepts.

The above mentioned German and French publishers (and the French Institute National de Recherché Pédagogique) have been accepted as new cooperation partners of the project and contributed data to the content base. With their help, a test sample of French educational research open access publications from several educational science subfields could be compiled.

Results

Due to the combined effort of data aggregation, by March 2011 the content base consisted of a total of 41,240 documents: more than 12,000 from publishing houses and nearly 30,000 from the World Wide Web. The texts represent the EERQI-languages German, English, French and Swedish, but are not evenly distributed over the languages. The largest number of contributions is in English, followed by German and French.

One important result of the analysis of the Swedish situation was that a critical mass of Swedish texts could not be acquired by the project. The number of educational research texts published in Swedish diminished radically in the last decade. Today, the main language of educational research publications in Sweden is English. If Swedish texts are produced, they are available in University repositories and other semi-public sources¹.

¹ see also Hansen, M. & Lindblad, S.: Forskningskommunikation och publiceringsmönster inom utbildningsvetenskap. En studie av svensk utbildningsvetenskaplig forskning vid tre lärosäten, Vetenskapsrådet, 2010

Work Package 1: Content Aggregation

The following table gives an overview of the content in the EERQI content base:

Overview of content:				
Publisher	Document type	Metadata	Content	Language
Barbara Budrich	PDF, partially RAR archive	no	250 articles from periodicals, incl. "Diskurs Kindheits- und Jugendforschung"	German
FIS Bildung	text, partially zip archive	yes (xml)	2777 articles and conference recordings	German, English
INRP	XML	yes (xml)	2389 articles	French
IRDP	PDF + xls	yes (xml)	156 articles from edited volumes, periodicals, research reports	French, English
Symposium	PDF + XML	yes (xml)	3000 articles from periodicals, incl. "Contemporary Issues in Early Education"	English
Taylor and Francis	PDF + XML, partially zip archives	yes (xml)	202 articles from periodicals, incl. "Educational Studies"	English
VS-Verlag	PDF + XML, partially zip archive, book cover as .jpg	yes (xml)	3500 articles and monographs	English German
Waxmann	PDF + XML	yes (xml)	57 monographs	German
Various	XML – WWW Index	yes	28.909 articles from periodicals, monographs	English, German, French, Swedish

Work Package 2: Technical Corpus Analysis
Summary of Progress
<p>The first aim of this work package was to build an internal database, secured against access by third parties, with metadata and full texts from the publishing houses, being project partners or associates of EERQI, in order to test and structure a first version of the content base. The second aim of this work package was to give a detailed report on the structure (e.g. semantic syntactic structure, reference linking) of this content. This report was given to the project partners in September 2008. In addition, a lot of the metadata included in the full-texts explicitly or implicitly were extracted into external metadata files, to make them easily accessible for the project needs.</p> <p>WP 2 was finished during the first period of reporting.</p> <p>The documents are now part of the EERQI content base and will be available for further scientific usage. EERQI's publisher partners confirmed their consent to the latter after the establishment of an access procedure that ensures the safeguarding of property rights.</p>
Results
<ul style="list-style-type: none"> • Initial version of the Content Base • Continuous Updating of the Content Base • Technical Analysis of the document formats in the Content Base by XEROX • Technical Corpus Report • Data analysis report at a project meeting (September 2008, Gothenburg)

Work Package 3: Analysis and Evaluation of Existing Methods and Indicators for Quality Assessment
Summary of Progress
<p>The first approach to developing new quality indicators was a state-of-the-art report about existing methods and indicators. The report was prepared by DIPF for the first EERQI Workshop in Leuven, 2008. It included an overview of widely used methods for quality detection and techniques</p>

Work Package 3: Analysis and Evaluation of Existing Methods and Indicators for Quality Assessment

still in development, e.g., online usage metrics and new retrieval and clustering approaches. Areas to be explored by the EERQI project, e.g., the role of semantic text analysis were considered. The report presented a range of indicators to be explored within the EERQI project and contained recommendations for the First EERQI workshop. A revision of the report was produced after discussions in the workshop, with special assistance by BERA.

WP3 was finished during the first period of reporting.

Results

As a result of WP3, the following state-of-the-art report was authored and distributed by DIPF (see <http://www.eerqi.eu/page/publications>).

- State-of-the-art report “Analysis and Evaluation of Existing Methods and Indicators for Scientific Quality Assessment”, distributed to the participants before the first EERQI Workshop, June 20-21, 2008 in Leuven, Belgium.

Based on:

- Working paper: “The role scholarly publications play in national evaluation procedures. An overview of the evaluation practices in different European countries.” A document based on a questionnaire prepared in the context of EERQI for the First EERQI Workshop, June 20-21, 2008 in Leuven, Belgium.

Work Package 4: Specification of New Scientific Quality Assessment Indicators and Methods for Measuring Research Quality in Scientific Publications

Summary of Progress

Work Package 4 developed new quality indicators and methodologies in the field of educational research.

As the outcome of the first workshop in Leuven, 2008, a preliminary list of new quality indicators was established (see also deliverable 2a). Based on this list, a continuous process of further development, consultation and evaluation of a comprehensive set of qualitative indicators as part

Work Package 4: Specification of New Scientific Quality Assessment Indicators and Methods for Measuring Research Quality in Scientific Publications

of EERQI's Prototype Framework was carried out at different project meetings such as the EERQI Semantic Meeting in Grenoble 01/2010, the EERQI General Assembly in Hamburg 03/2010, the EERQI Meeting at ECER in Helsinki 08/2010, the 2nd EERQI Workshop in Genève 10/2010, the EERQI General Assembly in Hamburg 11/2010 and the EERQI final conference in Brussels 03/2010. The initial list was continuously updated and revised.

As EARLI left the consortium in September 2009, the tasks of this partner in WP4 were taken over by UHambDE and EERA.

At an early stage, expert consultations and considerations lead to the strategic decision that the EERQI-Indicators had to be differentiated into two types:

- intrinsic evidence (indicators) of quality, i.e. indicators that derive from and can be identified in a text itself;
- extrinsic evidence (indicators) of quality, i.e. indicators that derive from metadata (= bibliometric or webometric information).

The further development of the latter was carried out within the framework of WP 1, 2, 5 and 6. In WP6, tests of the correlation of intrinsic and extrinsic indicators were eventually started and are still carried out after March 2011.

Testing of Intrinsic Indicators

By means of iterative expert consultations carried out in cooperation with the European Educational Research Association (EERA), National Educational Research Associations such as the EERQI-Partners BERA and SSRE, the German Educational Research Association DGfE, the World Educational Research Association WERA and further relevant individual educational researchers such as the EERQI-partners UmU, UHambDE, IRDP, Radboud-NL and ESOE(TU/e), the preliminary list of intrinsic indicators was gradually structured, modified and condensed to the following five indicators:

- rigour,
- originality,
- significance (for other researchers, policy and practice),
- integrity (including considerations of authenticity, honesty and ethical requirements in the conduct of research),

Work Package 4: Specification of New Scientific Quality Assessment Indicators and Methods for Measuring Research Quality in Scientific Publications

- style (including clarity, communicability, eloquence and elegance).

These were unanimously positively evaluated by the consulted experts as being generic indicators that are generally relevant for the assessment of educational research quality.

The indicators were then operationalized and transferred into the 'EERQI Peer Review-Questionnaire' that was tested in three waves (responsible: EERA and UHambDE with support of Radboud-NL).

The first wave was carried out in winter 2009 / spring 2010:

According to the results of the statistical analysis and the qualitative information, the following modifications of version 1 of the questionnaire were introduced:

- The number of indicators was reduced to the three main indicators *rigour*, *originality* and *significance*. Questions referring to integrity and style were included in the scales for rigour and originality.
- The items' scaling was enlarged in order to receive a better variance of the ratings.
- Additional items on demographic data of the reviewers and open questions were included in order to receive more detailed information on the practical use of the questionnaire.

The second wave aimed at testing the operationalization of the indicators and the reliability of the instrument and was carried out from June 2010 to September 2010. On the basis of the received results, the second version of the questionnaire was revised again and tested in a third wave from December 2010 to January 2011 aiming at a further refinement of the questionnaire in terms of its validity and practicability. The third wave was based on the elicitation of qualitative feedback from members of the educational research community with respect to the acceptance of the questionnaire (see WP 10) and led to the final version of the questionnaire containing the three above mentioned scales and 16 items.

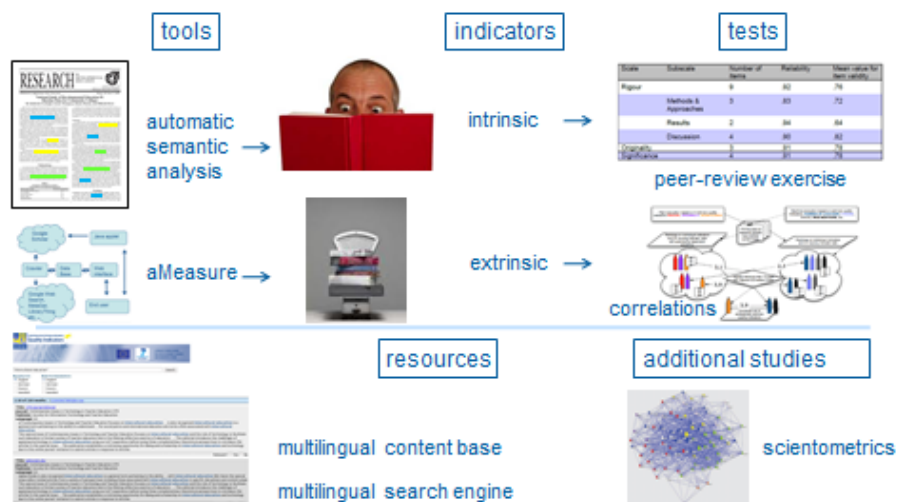
Results

The final version of the questionnaire includes three scales as operationalizations of the intrinsic indicators *rigour*, *significance* and *originality* by means of 16 items. Wave one and two of the testing had led to the result that the indicators 'integrity' and 'style' function better as elements and dimensions of the three scales than being independent scales for themselves which led to the decision to integrate them into the three scales for rigour, significance and originality.

Work Package 4: Specification of New Scientific Quality Assessment Indicators and Methods for Measuring Research Quality in Scientific Publications

The final version of the Peer Review Questionnaire is part of the EERQI Prototype Framework. It functions as a support instrument for a reader who has to take a final decision on the quality of a (or a number of) text(s).

Figure 2 illustrates the foundations of EERQI's Prototype Framework:



Especially helpful for the reviewing process were the reviewers' comments on the relevance of the indicators and the practical use of the questionnaire. Their acceptance and indication of usefulness of the questionnaire was especially high in reference to educational research texts that derive from empirical studies. The statistical results, however, show that the questionnaire can well be applied to other areas of educational research such as historical and philosophical research in education, empirical research and international comparative / intercultural research alike.

All test and item characteristics show good to very good values, which could be confirmed for subsamples of different areas of educational research with different cultural / linguistic backgrounds.

Work Package 4: Specification of New Scientific Quality Assessment Indicators and Methods for Measuring Research Quality in Scientific Publications

The following table illustrates the values for the scales:

Table 1: Overview Final Scale Values

Scale	Subscale	Number of items	Reliability	Mean value for item validity
Rigour		9	.92	.76
	Methods & Approaches	3	.83	.72
	Results	2	.94	.64
	Discussion	4	.90	.82
Originality		3	.91	.78
Significance		4	.91	.78

The reliability is measured by using Cronbachs Alpha. The item validity is measured by using a procedure presented and tested by Yousif, Koopmann & Amelang (Yousfi, S., Koopmann, B., & Amelang, M. (2005). *Correlates of item validity. On the eminent importance of global self-ratings*. Unpublished manuscript.

The additional analysis of qualitative responses substantiates that the questionnaire includes the most important indicators in the field of quality assessment in educational research publications, at least in the three research areas that were taken into account.

The process of the development and the evaluation results of the questionnaire as well as the final version of the instrument were presented to the educational research public at different occasions such as various international research conferences, the 2nd EERQI workshop in Genève 10/2010 and the EERQI Final Conference in Brussels 03/2011. At all occasions, the responses and feedback were entirely positive. Different suggestions for an extended use of the questionnaire, for instance a further development for the purpose of training (especially new) researchers in assessment tasks, were made. This possibility will be further explored together with EERQI's publisher partners in the future.

EERQI's intrinsic indicators and their operationalization as shown in the questionnaire were successfully tested. The acceptance of the instrument in the educational research community appears to be high according to our investigations. The implementation of this instrument will support the intentions to facilitate and to raise the transparency of assessment processes. This

Work Package 4: Specification of New Scientific Quality Assessment Indicators and Methods for Measuring Research Quality in Scientific Publications

again will enhance the quality of quality assessment procedures as such.

Work Package 5: EERQI Search and Query Engine Development

Summary of Progress

The EERQI Search and Query Engine is another core element of the EERQI Prototype Framework. It is a tool that enables the determined finding and identification of educational research documents. It allows for dynamical identification of documents in the field of educational research via automatic methods (crawling and harvesting). It makes those documents available for extended searching, text mining and analysis. Furthermore, it allows for the identification of educational research documents in the four 'EERQI-languages', namely English, French, German and Swedish (see WP 9).

One source for the EERQI Content Base are documents supplied by the publisher partners. This task comprised the processing and indexing of mainly PDF full text documents, as well as corresponding metadata, wherever available. The other source is the World Wide Web. Here, the search and query engine was used for the expansion of the content base with Web documents. A new focused crawler was developed for this task by RRZN. This crawler harvests educational research documents from the WWW. Both local (publishers') and public (WWW) documents were augmented with metadata wherever possible. All indexes are accessible via a common user interface and a sophisticated query language (Lucene query syntax) which allows a Boolean query of all available indexed fields.

Further collaborative work of RRZN and XEROX was carried out to specify and implement a distributed system whereby documents from the content base, stored on the server at HU-Berlin, are retrieved by a server in Grenoble and processed by XEROX' linguistic processing tools. The results are uploaded back to the content base in Berlin, and then processed by the indexer.

Several methods have been evaluated and used for carrying out the task of crawling the WWW: the Nutch open source crawler was used to harvest potential educational research documents. This program was extended by a custom plugin, developed by RRZN, which is capable of indexing only documents relevant to educational research. The relevance algorithm is configurable and capable of combining several methods of determining educational research documents or documents of other research fields. Initially indicators such as a combination of checking for

Work Package 5: EERQI Search and Query Engine Development

relevant keywords, a reference section, the minimum length of the document and a whitelist/blacklist of URLs were used.

Another extension to the Nutch open source software was the calculation of a fetch score for unfetched documents. This fetch score is calculated due to already fetched documents and their ascertained relevance and is used to optimize the crawling process.

The crawling process with Nutch was enhanced by a program which was used to harvest educational research documents from Open Access repositories like OAster, SSOAR and Swepub. The advantage of using these repositories was the compilation of additional metadata for the documents. A special focus was put on Swedish repositories because the content base of documents provided by the publishers included no documents in Swedish at all and the crawling results for Swedish documents were also insufficient (see further explanation: WP 9).

Later, a Classifier, developed by ISN was integrated. The Classifier delivered algorithms that support an automatic decision if a crawled site is of relevance for the project or not. These algorithms were trained and implemented as a cloud-distributed computing, in order to fit the extensive computing needs.

The implemented algorithms are usable via API² for project internal needs. They can also be transferred to other research fields. In order to do so, the classifier needs to collect training data (from this field and from outside the field), train the algorithm and evaluate if the training process gave reasonable results. The new classifier needs to be implemented into the field specific workflow, which may be communicated via API. In the middle of May 2011 ISN commenced a project together with IfQ (www.forschungsinfo.de) in which they are developing and testing the classifier for other fields of SSH and non-SSH research.

² Application programming interface (API)

Work Package 5: EERQI Search and Query Engine Development

Results

Figure 3: A Screenshot of the EERQI Search and Query Engine with multilingual functionality

The screenshot displays the EERQI Search and Query Engine interface. At the top, there is a browser window with the address bar showing 'http://localhost:8080/eerqi/?wicket:interface=:1:1:::'. The page title is 'Eerqi advanced search page'. The main header features the EERQI logo and the text 'EUROPEAN EDUCATIONAL RESEARCH Quality Indicators'. Below the header, there are logos for the European Union and the Seventh Framework Programme, along with the text 'A PROJECT FUNDED UNDER THE SOCIO-ECONOMIC SCIENCES AND HUMANITIES THEME'. The search input field contains the query '"cultural identity"' and a 'Search' button. Below the search field, there are two columns of radio buttons for selecting the language of the query and the documents. The search results are displayed in a list format, showing the title, language, and a snippet of the document content. The first result is titled 'APPROCHES CULTURELLES DANS L EDUCATION MUSICALE EN SUISSE ROMANDE' and is in French. The second result is titled '5 helldin.fm' and is in Swedish. The third result is titled 'Electronic Magazine of Multicultural Education' and is in English. Each result has a 'Relevant?' checkbox with 'Yes' and 'No' options. On the right side of the search results, there is a box labeled 'Expand your search' with the text 'foreign culture'. The bottom of the browser window shows the 'Done' status bar and the Zotero extension icon.

File Edit View History Bookmarks Tools Help

http://localhost:8080/eerqi/?wicket:interface=:1:1::: Google

Eerqi advanced search page Version 1.0.15

EERQI EUROPEAN EDUCATIONAL RESEARCH Quality Indicators

A PROJECT FUNDED UNDER THE SOCIO-ECONOMIC SCIENCES AND HUMANITIES THEME

"cultural identity" Search

My query is in

- English
- German
- French
- Swedish

Show me documents in

- English
- German "kulturelle Identität"
- French "identité culturelle"
- Swedish "kulturell identitet"

1-10 of 508 results: 1 2 3 4 5 6 7 8 9 10 > >>

Expand your search
foreign culture

Title: [APPROCHES CULTURELLES DANS L EDUCATION MUSICALE EN SUISSE ROMANDE](#)
Language: fr
la compréhension mutuelle par **identités culturelles** présentes VD la reconnaissance des éléments culturels ... culturelle à travers la reconnaissance des **identités culturelles** dans la classe ce qui nous permet d ... Reconnaître les différentes Développer la compréhension mutuelle par **identités culturelles** présentes VD la reconnaissance des éléments culturels dans la classe et en expérimenter communs et ceux qui nous différencient ... Seuls les documents des cantons de VD et le PECARO proposent la création d une signification culturelle à travers la reconnaissance des **identités culturelles** dans la classe ce qui nous permet d interpréter cette approche comme inter culturelle
Relevant? Yes No

Title: [5 helldin.fm](#)
Journal: Pedagogisk Forskning i Sverige
Language: sv
inte variationen i form av olika **kulturella identiteter** utslä-9tas Erkänn vi inte för dem vi är» är risken möjliga ... Hans ständigt återkommande tema är hur den demokratiska rätten till likabehandling kan utformas så att inte variationen i form av olika **kulturella identiteter** utslä-9tas
Relevant? Yes No

Title: [Electronic Magazine of Multicultural Education](#)
Journal: Electronic Magazine of Multicultural Education
Publisher: Eastern University
Language: en
are likely to arise and racial and **cultural identity** issues begin to formulate Parents and adopted children ... discovered in their study of Mexican Americans that a positive **cultural identity** predicted an achieved ... **cultural identity** and ego identity among African Americans and Mexican Americans Journal
Questions are likely to arise and racial and **cultural identity** issues begin to formulate ... The adoptive parents and staff desired to educationally serve the children' needs and to be responsive to their emerging issues ... Parents discussed issues about raising children in a mixed race family while the children rode horses sang Chinese songs cooked meals and learned the language and dance
Relevant? Yes No

Done zotero

Work Package 5: EERQI Search and Query Engine Development

The EERQI Search and Query Engine is available for the public via the EERQI Web portal, see www.eerqi.eu.

A second product is the trained Classifier that is useable via API for EERQI project internal needs and is transferrable to other research contexts.

Work Package 6: “Testing new indicators, implementation and prototyping operations on the federated content base”

Summary of Progress

The aim of WP6 was to apply the discovered extrinsic as well as intrinsic indicators and methodologies to the aggregated content base (WP1). This involved at first the addition of necessary metadata to the texts in the content base. At second it enclosed the development and application of a methodology for the evaluation and testing of the new set of indicators.

Tasks

The tasks in WP6 were:

- Converting the sources harvested in the content aggregation phase to text/XML formats that enable searching, text mining and analysis.
- Developing a methodology using the query engine (WP5) to apply the new extrinsic indicators to the content base and test them with respect to usability, reliability and effectiveness.
- Assisting XEROX with subjecting the documents to semantic and linguistic analysis processing as defined in WP8 and WP9.
- Compilation of obtained results and preparation for statistical analysis to test the cor- or interrelations of the intrinsic indicators (as developed in WP 4) and the extrinsic characteristics of quality. This task was supported by UHambDE, Radboud-NL and EERA.
- Compilation and preparation of results for demonstrating them at the Second EERQI Workshop in Geneva, 2010. This task was carried out in cooperation with IRDP (WP10). It also included assisting ISN in creating an online demonstrator for prior-to-workshop tests by participants of the workshop and other experts who were involved in

Work Package 6: “Testing new indicators, implementation and prototyping operations on the federated content base”

the research quality verification procedure.

- Revision of the preliminary results as presented at the Second Workshop; preparation of a final report and documentation on the basis of further testing; draft presentation at the final EERQI conference in Brussels, 2011.

The work was carried out in a technical working group of EERQI-partners, coordinated by HU-Berlin (assisted by other EERQI-partners when necessary, e.g. EERA, UHambDE). The maintenance of the EERQI servers (public and internal) as well as the set-up of the data base structure was organized and a system of graduated access to the parts of the content base was developed and sustained.

Results

The work in WP 6 led ad (i) to a tool that is a necessary prerequisite for carrying out assessment processes by measuring the extrinsic indicators of research documents (aMeasure). Ad (ii), results were achieved via iterative processes of analysing possible cor- or interrelations between the extrinsic and the intrinsic characteristics of quality. Ad (iii), a citation analysis was carried out.

i. The instrument aMeasure

For the automatic collection of extrinsic indicators, a JAVA application (aMeasure) was developed which will be available under the Apache 2.0 license for public use and refinement (WP 11) after the end of the project.

aMeasure consists of the following four parts:

- a crawler to gather all information from Google Scholar, Google Web Search and the Social Network Services
(<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0012133>,
retrieved: 2010.09.27)
- a database to store the gathered information (http://en.wikipedia.org/wiki/Screen_Scraping,
retrieved 2010.10.05)
- a client side application (JAVA-applet)
- a Web interface to present the results and the content of the database to end users

Work Package 6: “Testing new indicators, implementation and prototyping operations on the federated content base”

The main component of aMeasure is the crawler. Google Web Search, MetaGer and Social Network Services are queried to get information about the impact of an author's papers. For optimal work, the crawler needs to be provided with author names. It has turned out that the major challenge in gathering extrinsic characteristics of research publications is the reliable identification of author names in Social Network Services, Google Scholar, Google Web Search and MetaGer. As it is impossible to get hold of each author's individual curriculum vitae the HU-Berlin team decided to limit the search results to the last 60 years arguing that an author is unlikely to start publishing before his/her 20th birthday and after his/her 80th year of life.

The process of crawling is carried out from a central server located at HU-Berlin. All gathered data is stored in a central Mysql database located on the EERQI server to enable various exports via the Web interface. Google Scholar is used to retrieve information about authors and their papers as well as the citations of these papers. Due to the fact that Google does not provide an API, aMeasure is required to use a technology called Screen-Scraping. The same technology is used to query MetaGer and the Social Network Services.

As it turned out, all methods that were used have their specific limitations with respect to author identification. Thus, it is a task for further research and development to identify and define a valid method for this. Different attempts to reach this aim have already been made by several research and development groups, to which the EERQI analyses contribute further knowledge. Our research led to the result that a more comfortable method should be used such as retrieving results from Google Web Search and Mendeley as they provide APIs to their search engines. A test of making the results more precise via the matching of author names and affiliations or places turned out negative. The problem of a standardization of e.g. institutions' names, change of places etc. is out of the scope of this project. The high mobility, especially of new researchers, leads to the loss of a large amount of publications. The interdisciplinary network ORCID (www.orcid.com) comprising of publishers, research organizations, libraries and companies addresses this issue through the development of a comprehensive “research identifier” which is to be publicized by the end of 2011.

Using aMeasure, the following *extrinsic characteristics* were retrieved and calculated from Google Scholar, Google Web Search and MetaGer:

- number of papers per author,
- number of citations per author,
- first year of retrieved publication until last year of retrieved publication,

Work Package 6: “Testing new indicators, implementation and prototyping operations on the federated content base”

- citations per year,
- citations per paper,
- the g-index (an improvement of the h-index),
- hits matching author’s name (Google Web Search and MetaGer).

Using aMeasure, the following *extrinsic characteristics* were retrieved and calculated from Social Network Services

- citulike hits matching the author's name and the article’s title,
- LibraryThing hits matching the author's name and the article’s title,
- Connotea hits matching the author's name and the article’s title,
- Mendeley hits matching the author's name and the article’s title as well as readers of articles in Mendeley.

The following *intrinsic characteristics* resulted from WP 4 (see further explanation there):

- rigour
- originality
- significance (for other researchers, for policy, for practice)
- integrity (including considerations of authenticity, honesty and ethical requirements in the conduct of research)
- style (including clarity, communicability, eloquence, and elegance).

ii. Cor-/ interrelations between extrinsic and intrinsic characteristics of quality

The final step of the work package was to analyse the possible relations between the extrinsic and the intrinsic indicators. Three approaches were carried out, one by Radboud-NL (results were presented at EERQI’s Final Conference³), the second by HU-Berlin, the third in cooperation of EERA and UHambDE.

In all three approaches, no significant correlations between the extrinsic and intrinsic indicators

³ Mooij, T.: European Educational Research Quality Indicators (EERQI): A first Prototype Framework of intrinsic and extrinsic indicators. Paper for the final EERQI conference, 15-16 March 2011 (unpublished manuscript), p. 15

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were identified. A test of modelling the correlation between the different indicators by using a non-parametric regression model was not successful (approach 1). The measurement model with three intrinsic and two extrinsic latent factors which was constructed by Radboud-NL, showed that significant correlations do exist *among* the intrinsic and *among* the extrinsic factors. However, no significant correlations were found between the intrinsic and the extrinsic factors. In approach 2, rank correlations and conducting factor analysis calculations based on 179 articles were carried out. In approach 3, a test of modelling the correlation between the indicators by using different regression models (non- parametric) was also not successful.

The result of these testings was, in short:

- The directly summed up (linear) correlations between the extrinsic and intrinsic indicators that were developed in EERQI are low. It has to be mentioned though that these attempts were based on the testing of uni-variate and linear correlations between the two sets of indicators. Correlations between the multivariate elements of each set of parameters are most probably non-linear and complex. Tests of non-linear correlations (multivariate analyses) are still ongoing (responsible: UHambDE and ISN). The results of this further testing will be published in an article⁴. – Anyhow, our completed testing shows that both sets of parameters are complementary to each other, not contradictory. This can mean for example, that a paper which has been assessed as ‘significant’ may be well cited, even if it was not considered to be ‘original’.
- The inter-correlations between the extrinsic respectively the intrinsic indicators are high. The results give evidence that the indicators are multi-collinear.

Our key findings are in line with former research results and contributions to debates about assessment procedures and indicator systems. Extrinsic and intrinsic parameters obviously deliver evidence on different aspects of the potential quality of research texts. They can complement, but most possibly cannot replace each other – at least not in the given state.

Depending on the type of information that is expected as the result of an assessment process, either one of the approaches or a combination of both is recommendable for a valid result. The more the expected result is related to actual ‘inner’ characteristics of the text itself, the more weight has to be given to intrinsic indicators. In the latter case, the application of extrinsic indicators can

⁴ to appear in Gogolin et al. (2012): “Preliminary Title: European Educational Research Quality Indicators (EERQI) – Results of a European Research Project”, VS-Verlag, Wiesbaden, 2012

⁵ Mooij, T.: European Educational Research Quality Indicators (EERQI): A first Prototype Framework of intrinsic and extrinsic indicators. Paper for the final EERQI conference, 15-16 March 2011 (unpublished manuscript), p. 15

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fulfill filter functions in the process, for example by offering information that is relevant for decision about inclusion or exclusion of authors or texts in the further assessment process. In a conclusion with respect to the power of the statistical analysis that was carried out, Radboud-NL states: “The differentiated relationships and outcomes [...] support the validity of both the conceptual framework and the empirical research. It can be concluded that an example of a prototype EERQI framework has been constructed. [...]. It is furthermore concluded that the conceptual EERQI framework was checked successfully in a first empirical test. The main goal of the EERQI project - to improve citation-only based assessments of the quality or impact of educational and other research - has been supported”⁵.

In other words: Our results support the assumption that the construction of a Framework, consisting of different tools with complementary functions which can be applied in intelligent combinations in assessment processes, is a relevant contribution to the enhancement of the quality of evaluation procedures in educational research, but moreover also in other fields of SSH. As the results achieved in EERQI concern research publications in four European languages, they also show a way to strengthen the European Research Area.

iii. Citation Analysis

For the semantic analysis a retrieval strategy for Web of Science non-source item journal articles was applied. Some general structures of citations to EERQI content base journals from Web of Science journals could be identified. One aspect was the impact of EERQI content base journals on research field level. A relatively high impact could be identified in - apart from educational research - psychology and computer science. A moderate impact could be identified in other SSH fields, such as language studies and history. A relatively small, but still present (and perhaps more surprising) impact could also be identified in the hard sciences and medicine. Another aspect was the distribution of citations between articles. The results show a wide spread distribution: a relatively low number of citations are spread over a large number of articles.

In addition to impact analyses of EERQI content base journals in Web of Science, a tentative analysis on a relatively small sample of articles in Google Scholar was performed. It showed similar results to the Web of Science data. The few cases of more highly cited articles seem to be connected to social and political debates on the same topic that the cited articles were approaching.

Another aspect of analysis was the "life-span" of cited articles. A growth of the number of citations

Work Package 6: “Testing new indicators, implementation and prototyping operations on the federated content base”

could be identified over at least a seven year period. This can be compared to average "citation half-life" of eight years for educational research journals indexed in the Web of Science databases.

In terms of the language of citing publications, the citation traffic is very much kept within the own language of the article.

All these results must be interpreted with care, considering the small samples, low frequencies of citations and wide distribution of citations. A conclusion that can be drawn however is that the weakness of identifiable patterns is likely to be found also in analyses on larger aggregations of data. The general patterns are similar to those identified in other analyses of educational research articles. This is an issue which needs to be considered before making any attempts of using citation analyses for research evaluation purposes in educational research.

Work Package 7: Legal aspects and Intellectual Property Rights

The results of WP7, a legal framework for storage and use of the electronic documents aggregated in the EERQI content base, was established and completed in the first reporting period (see 1st Periodic Report).

Work Package 8: Semantic and Linguistic Quality Detection and Evaluation Methodology

Summary of Progress

This work package investigates the possibilities of automating the discovery of *semantic indicators of quality*, i.e. indicators that are characteristic of the content of research publications.

This work package has three different components: *Citation analysis*, *Automatic semantic analysis* and *Genre analysis*

1. Citation analysis: type citations according to the author's motivation of citing – contributor: LUB-LU

Work Package 8: Semantic and Linguistic Quality Detection and Evaluation Methodology

The interest of this task lies in the rethinking of the method of using citations as quality indicators as citation indexes are widely criticized for not being directly correlated with quality. This criticism is based on evidence showing that the underlying assumptions of using citation numbers as proxies of research quality do not hold⁶.

EERQI concentrated on providing evidence for the invalidity of one of the underlying assumptions, namely the idea that research communication is merely cumulative in the sense that one piece of research is cited by another piece of research in order to build on it for accumulating knowledge. This assumption gives each citation the same weight as a quality indicator in citation indexes. EERQI argues that *citation typing* provides evidence for the fact that research communication – especially in the social sciences and humanities – can also be negotiating. In this case new knowledge does not directly build on the cited knowledge and possibly even contradicts it. Consequently, in these two cases, research quality can not be indicated in the same way.

To identify the type of citations matching the author's motivations, the XEROX Incremental Parser was used with support of DIPF and HU-Berlin.

2. Automatic semantic analysis: reading assistance and enhancing the search engine (with tests in the four EERQI languages) – main contributor: XEROX, supported by DIPF and HU-Berlin who provided access to the EERQI content base.

The goal of this is twofold:

- (a) Providing reading assistance to peer-reviewers.

EERQI considers the intrinsic indicators of quality as defined in WP4 (significance, rigour, originality, integrity and style) as revealable by human reading only. Human reading, however, is time-consuming and hard intellectual work. One technique of assisting the reader is highlighting key messages *automatically*, i.e. by focusing the reader's attention to the main message. Following the definition of the intrinsic quality criteria, the following two types of sentences are highlighted as key sentences: sentences that describe the research problems the article treats (1) and sentences that describe the author's goals, claims and conclusions (2). The effectiveness of highlighting was tested in a peer-review exercise in which peer-reviewers were asked to write brief references to the articles they read. These sentences were then compared to the highlighted sentences with the expectation that the

⁶ see also Paul, R.J.: Measuring research quality: the United Kingdom Government's Research Assessment Exercise, European Journal of Information Systems, 17/2008, S. 324–329

Work Package 8: Semantic and Linguistic Quality Detection and Evaluation Methodology

content of the highlighted sentences corresponds with the content of the 'human' reference. This testing was accompanied by further concerning the question whether highlighting salient messages in research texts supports reading comprehension and thus the peer review process.

(b) Enhancing the search engine.

Semantic analysis technology was integrated in the ranking algorithm of the search engine 6 (1) as well as the use of key sentences in the result snippets (2).

3. Genre analysis: automatic genre recognition – contributors: XEROX, supported by DIPF

The approach was carried out with the intention to automatically recognize the genre of a publication. This has been proposed in order to be able to refine indicators relevant to special sub-domains of educational research.

Results

1. Citation analysis:

We developed a set of rules that recognize the following citation types:

- ARGUMENTATION: Argumentation between the citing and the cited work.
- EVIDENCE: The citing work provides evidence for the cited work.
- IMPORTANCE: The author of the citing work considers the cited work important.
- QUALIFICATION: The cited work is qualified by the citing work.
- SURPRISE: The author of the citing work is surprised by the cited work.

A result of the approach was that citation analysis of this kind cannot be applied to all articles because the forms (standards) of citations are very different. Not all of them were recognized by the analyzer in the given state.

Using bibliometric methods for investigation on semantic structures in educational research texts brought to light that the presence of identifiable patterns is low. The relative lack of structure in both semantic and citation patterns made attempts at the originally intended comparison of semantic and citation structures an option that has to be further developed in close cooperation with the educational research community, as here a dialogue on adequate, possibly more standardized structures is necessary.

2. Automatic semantic analysis:

a) Peer reviewing:

For the peer-review exercise, we asked the participants to summarize articles for a subsequent comparison of the human summary sentences with the automatically detected sentences in order to know to what extent the two sets of sentences correspond.

The results are the following:

- 84% of the human summary sentences correspond to an automatically detected sentence from the article.
- 56% of the corresponding sentences fulfill the criteria of salient sentences.
- 68% of the salient sentences are detected by XIP.
- nouns occurred averagely 4 times more in human summary sentences than in the automatically highlighted sentences.

The results show that the automatically detected sentences cover a considerable proportion of human summary sentences.

The semantic analysis for highlighting key sentences was, besides English, carried out in the other three EERQI-languages German, French and Swedish (supported by DIPF, IRDP/SSRE, UmU) which necessitated the creation of grammar rules in those three languages. Four tests which probed the possibility of carrying out peer-reviewing based on the highlighted sentences were carried out by XEROX.

The results are the following:

- highlighting allows evaluation according to the criteria of significance, originality and style, but not according to integrity and rigour,
- results are different according to genre (see genre analysis below),
- highlighting makes it possible to rapidly filter out bad quality as processing highlighted texts in the testing took 4 times less time than processing with non-highlighted texts.

b) Search engine:

Testing the effectiveness of key-sentence extraction in relevance ranking, our results show that the relevant articles returned by the EERQI search engine without using the key sentences and those selected with the key sentences are disjoint, i.e. the two approaches are complementary.

Work Package 8: Semantic and Linguistic Quality Detection and Evaluation Methodology

This suggests that key sentence detection is promising and that the integration of the two tools can be beneficial for the user.

3. Genre analysis:

For the Genre analysis, we tested how well the analysis worked for different genres of educational research.

The results are the following:

- in theoretical articles the proportion of detected research issue sentences is significantly higher than that of summary sentences,
- the best performance was achieved in theoretical articles from an educational sociology context.

Work Package 9: Accommodating Europe's Multilingual Environment

Summary of Progress

The aim of this work package was to enhance the relevance of the delivered results of the query engine by using educational thesauri, multilingual capabilities as well as semantic analysis. The main contributor of WP 9 was XEROX; further contributors were RRZN, DIPF, IRDP and HU-Berlin.

Educational thesauri and dictionaries provide the search engine with the functionality of returning documents that do not contain the query term but another term linked to it in the resource. Through the thesauri the user can obtain documents that deal with the topic expressed by the query term even if the term itself does not emerge in the document or does not emerge in it frequently enough.

Through the use of dictionaries in the background of the search engine, the user can obtain documents that contain the translation of the query term in another language, i.e. the search can become multilingual.

The use of semantic analysis in the search engine consists of taking advantage of the detection of key sentences in relevance ranking. Traditional relevance ranking relies on the frequency of the query term in a document without taking into account any contextual information of the use of that

Work Package 9: Accommodating Europe's Multilingual Environment

term. In the EERQI search engine the fact that the query terms emerge in key sentences is taken into account in relevance ranking besides mere frequency.

The work performed in this work package consists of gathering, preparing and integrating the resources and semantic analysis into the query engine. It can be divided into four main areas: integrating linguistic processing software into the search engine's indexing process (1), creating the topic-specific term networks that will be used for query translation and expansion (2), building the software module that performs query translation and identifies relevant term suggestions (3) and creating a user interface that makes this functionality available to public users via the Web (4).

Results

Multilingual term networks in the four project languages English, French, German and Swedish were constructed to support the multilingual search facilities (under the leadership of DIPF in collaboration with IRDP, the latter supporting the French-language parts). The term networks contain comprehensive field-specific terminology and relations between the terms. They assemble content from the European Education Thesaurus (EET), the Thesaurus for Education Systems in Europe (TESE), vocabulary used for indexing purposes in the documentation units of IRDP (French) and DIPF (German, English) as well as dictionaries and intellectual translations. For the Swedish-language part expert revisions were conducted as resources were less comprehensive in this case.

The term networks were constructed for five exemplar topic areas. They contain relevant terms for the topics and equivalency (1) as well as associative and hierarchical relationships such as narrower terms (2), broader terms (3), related terms (4) and synonyms (5). This collection of terms and their relationships target at query expansion strategies for the EERQI search engine to accommodate searching in the multilingual environment of educational research documents. It supports the retrieval of documents in different languages for the query language. Translations as well as alternative search terms related to the search queries are included and suggested to the user in all four project languages.

The covered topic areas are:

- professional development of teachers
- curriculum development
- educational effectiveness

Work Package 9: Accommodating Europe's Multilingual Environment

- intercultural education
- higher education

XEROX operated and completed the compilation and integration of term networks for the five representative topic areas in the search interface.

In addition, further objectives were achieved, such as:

- Integrating natural language processing tools (lemmatization, decomposing, and key sentence extraction) into the indexing subsystem of the search engine.
- Defining and implementing strategies for query translations and term suggestions using multiple resources (term networks, thesauri, and a general-purpose query translation service from the CACAO project).
- Developing a Web interface providing query expansions and term suggestions for the EERQI content base and iteratively refining it based on user feedback.
- Opening the search service to a worldwide audience after a few smaller and less formal rounds of user testing.
- Analysing data from user logs and feedback from questionnaires and interviews in order to understand how people are using the system and how it can be improved in the future.

The original description of the work in this package stated that a linguistic analysis of educational research texts would be provided in 14 languages. Since the EERQI content base only contains documents in English, French, German and Swedish we only worked with those four languages in the project.

Work Package 10: Verification of project results by scientific community

Summary of Progress

The aim of this work package was to ensure continuity in the testing and the verification of the methodologies developed in EERQI via an iterative process of discussions with a feedback from the members of the educational research community and further stakeholders from other scientific areas. This enabled an immediate integration of the feedback and results into the further development process.

For this purpose, presentations and workshops on the EERQI Prototype Framework were

Work Package 10: Verification of project results by scientific community

arranged and carried out by UHambDE and EERA with the support of other partners, especially BERA, ESOE (TUE), UmU, SSRE and DIPF at a number of relevant international conferences, such as the *European Conferences of Educational Research* (Vienna 2009 and Helsinki 2010), *Annual Conference of the American Educational Research Association* (AERA-Conference / Denver 2010), *German Conference on Educational Research* (DGfE-Konferenz / Mainz 2010), *Swiss Conference on Research in the Humanities* (Zurich 2010). At all occasions, the scientific communities' feedback was thoroughly reported back to the EERQI-team and considered in regard to eventual refinements of the methodologies that were developed. Furthermore, at these occasions volunteers for testing the Prototype Framework and gathering user feedback were recruited. All these activities were integral parts of the preparation of the second EERQI workshop and the Final EERQI Conference.

The preparation of the second EERQI Workshop, held on 17th-18th September 2010 at the University of Geneva (Faculty of Psychology and Educational Sciences) in Switzerland, was the declared and explicit objective of WP 10. Its aim was to present and demonstrate the developed sets of indicators, approaches and preliminary results of the testing of methodologies as well as presenting a preliminary evaluation of the project consortium. During the workshop, the participating experts were asked to give feedback on the proposed methodologies and indicators and to comment on the value and effectiveness of the Prototype Framework.

The workshop's main contributor was IRDP with the support of SSRE, UHambDE/Management and HU-Berlin as well as other project partners. It was financially sustained by the Swiss Academy of Humanities and Social Sciences (Académie suisse des sciences humaines et sociales / ASSH), the Swiss National Science Foundation (SNSF) and the FAPSE (Faculté de psychologie et de sciences de l'éducation; Faculté and Section) of the University of Geneva

Results

The objective of WP 10 was reached by gathering more than 70 participants from the field of educational research, European universities, research funding agencies, publishers and other relevant experts. The program contained presentations of the EERQI project, parallel sessions on specific topics such as the indicator framework (1), the design and implementation of an educational database (2), multilingualism and automatic semantic analysis, Bibliometrics /

Work Package 10: Verification of project results by scientific community

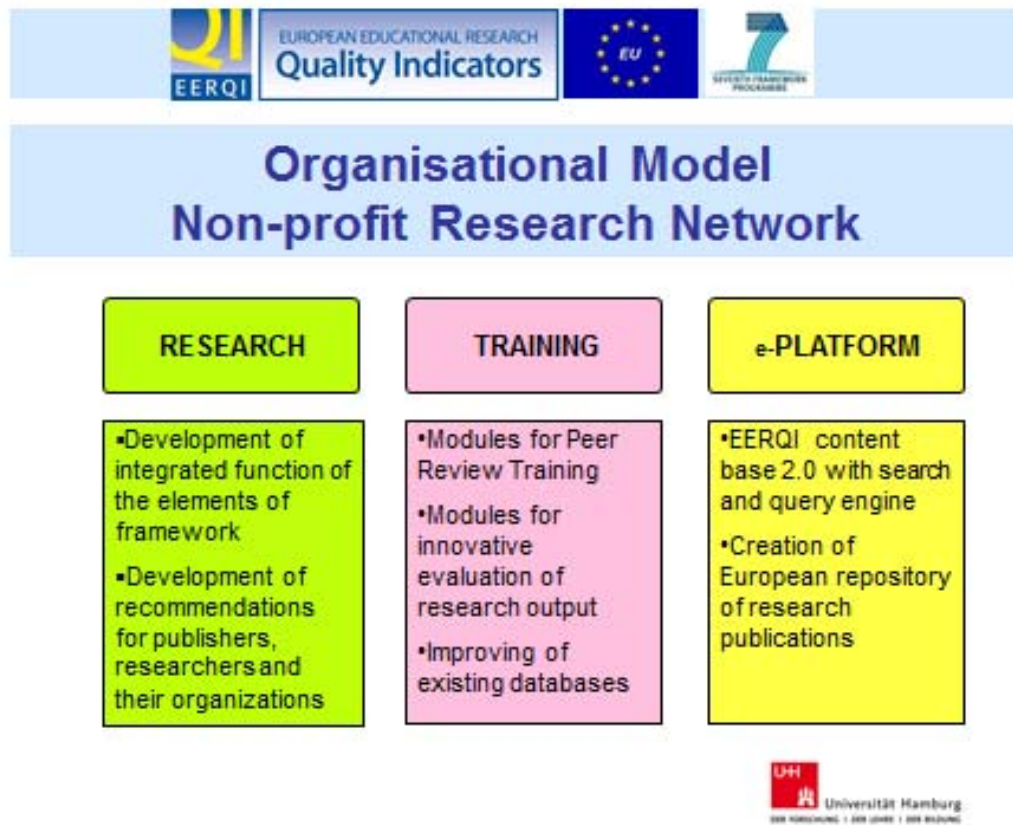
Webometrics (4) and a round table discussion and different lectures on EERQI's future.

The results of the fruitful discussions were incorporated in the different deliverables as far as possible. A scientific report was produced⁷ and presented to the EERQI-consortium.

⁷ <http://www.eerqi.eu/sites/default/files/Report%20nd%20Workshop%20by%20IRDP%20.pdf>

Work Package 11: Sustainability plan for maintenance of EERQI Framework
Tasks
<p>The aim of this work package was to develop a sustainability framework and ideas for maintaining and expanding the aggregated content base. This involved the following tasks:</p> <ul style="list-style-type: none">(1) An organizational basis (non-partisan environment) for sustainability should be envisaged and a scientific basis for the maintenance of the Prototype Framework should be developed.(2) Academic acceptance of indicators and framework should be reached.(3) A dissemination process should be set up in order to maintain transparency of the suggested framework and assessment procedures. <p>UHambDE (Management) is responsible for the sustainability plan in general. HU-Berlin coordinates the technical issues that are necessary to guarantee the sustainability of the developed framework. EERA participated in exploring legal and financial possibilities to realize follow-up projects and DIPF, RRZN, ISN and Xerox contributed to different approaches that were explored in order to sustain EERQI results.</p>
Summary of progress
<p>1. Organizational basis</p> <p>The project management explored a number of possibilities to develop an organizational basis for the sustainability of the EERQI Prototype Framework. The model that was favoured by partners at the General Assembly in Hamburg in November 2010, is the creation of a non-profit research network that can be developed in a differentiated process, comprising of the EERQI-products and the Prototype Framework as it stands.</p>

Figure 4: Organisational Model of the Research Network



The further development and realization of this model will be a joint endeavour. The consortium will apply a mixed-approaches strategy, comprising of

- contributions of relevant partners to maintain the EERQI-products,
- the targeted recruitment of new partners that complement the potential and expertise of the EERQI-team,
- the preparation of proposals for follow-up research (see below).

2. Academic acceptance

This task was achieved by presenting and discussing the EERQI-products and Prototype Framework in a large number of relevant conferences, addressing the different audiences that constitute the multidisciplinary composition of the project (see overview: dissemination). All feedback was systematically integrated in the development of EERQI tools and the framework in

Work Package 11: Sustainability plan for maintenance of EERQI Framework

the course of the project. This is still an ongoing process.

3. Further Dissemination

The adequate strategy for the EERQI project is the presentation of the EERQI products and the Prototype Framework to relevant audiences. This strategy was chosen because of the possibility to integrate feedback immediately into the research and development process itself. This strategy will continue. Contributions are already accepted for national and international educational research conferences (e.g. ECER 2011, Sept. 2011 in Berlin; Taiwan International Conference of Educational Research TICE, December 2011 in Taiwan; American Educational Research Conference AERA, April 2012 in Vancouver). Furthermore, a publication plan was developed, including open access publications via the EERQI Website and the publication of an edited book in which all project results will be presented (together with the EERQI publisher partner VS-Verlag).

Results

The development of a single financial model for the realization of the sustainability plan could not be achieved. The different approaches that were tested led to the result that none of the potentially interested partners – such as publishers, SMEs (technical partners), universities or research labs – is able to provide a sufficient financial basis for the provision of a comprehensive non-partisan, non-profit environment for hosting the EERQI Prototype Framework as well as the single EERQI products. Thus, the EERQI partners developed a model of shared responsibility for the coming three years, in which (a) the EERQI Prototype Framework and products will be available for the scientific, general and political public; (b) members of the partnership (on a voluntary basis) contribute to the acquisition of new partners, the advancement of a European research network and the development of follow-up research proposals that build on the achievements of the EERQI project.

(a) Sustainability of EERQI products and the Prototype Framework, in detail:

- The EERQI Website www.eerqi.eu will be sustained and maintained for at least three more years (responsible: ISN, UHambDE).
- The EERQI content base will be hosted and maintained by HU-Berlin; it will be accessible via the Berlin School of Library and Information Science <http://www.ibi.hu-berlin.de/>.

Work Package 11: Sustainability plan for maintenance of EERQI Framework

- The tool aMeasure (WP 6) will also be available under the Apache 2.0 license for public use and refinement after the project's end.
- The publisher partners agreed to deliver more contents if necessary for further research.
- It was intended that the EERQI search and query engine will be maintained and further developed by RRZN, an institute of the University of Hannover. Unfortunately though, the University of Hannover made a decision to close down the laboratory for search engine development in 2012. The development of an alternative institution that could continue with this important work (e.g. as a non-profit SME) is still ongoing. In the meantime, the search and query engine will be accessible via the EERQI Web site (<http://www.eerqi.eu/page/eerqi-searcher>). The multilingual functionality of the search and query engine is continuously supported by XEROX and also accessible via the EERQI Web site (or via <http://makalu.xrce.xerox.com/eerqi/>).
- The EERQI research and testing data will be available for follow-up research. The EERQI publisher partners agreed to further usage and exploration of their data for research purposes.
 - Researchers wishing to carry out additional analysis with the existing data will have to submit a proposal (via the EERQI website) to the Scientific Coordinator and Technical Coordinator. The project proposal must include the theoretical and methodological interest of the research, as well as the indication of the objectives of the study. Furthermore, confidentiality of data, data protection and property rights provisions have to be safeguarded and guaranteed. Each proposal will be examined by relevant members of the EERQI team in order to make sure that all formal and scientific requirements have been met. Furthermore, it will be taken into account if the envisaged research question can be answered in a meaningful way with the requested data and by the methods that shall be applied. If necessary, independent reviewers will be consulted in the approval procedure. A contract will clarify in any single case how the data can be accessed, how confidentiality and property rights will be safeguarded and how results will be fed back to the EERQI consortium or any follow-up organisation.
- The EERQI Peer Review Questionnaire and accompanying information will also be made available via the EERQI website for further usage and development. The possibility of transferring the instrument into a training instrument for reviewers will be explored with the EERQI publisher partners and interested editors.
- A detailed description of the EERQI Prototype Framework will be accessible via the Web site, illustrated by exemplary use case scenarios that show how the single tools and approaches can be intelligently combined.

Work Package 11: Sustainability plan for maintenance of EERQI Framework

These results of the EERQI project go beyond results of comparable European projects (such as: Scoping; ERIH). In contrast to those projects, EERQI can present applicable products, not merely journal lists (of contested quality as in ERIH) or recommendations (Scoping).

(b) Establishment of a European research network (EuRes) and development of a follow-up research proposal building on the results of the EERQI project

This chapter of the EERQI sustainability plan can build on the project's strengths, results and products, in particular:

- 'intrinsic' and 'extrinsic' quality indicators of educational research,
- a multilingual search engine that includes query expansion,
- automatic semantic analysis for the detection of key sentences.

The envisaged aim of a follow-up project is the development of a "Virtual Research Environment": a collaborative workspace for trans-national groups of educational and other SSH-scientists. This environment can also be used for the collective evaluation and writing of project proposals. A first case to test this workspace could be an EU call which is relevant for an international, interdisciplinary educational research project. One such topic we have identified is the call "SSH.2012.2.2-1 Governance of cohesion and diversity in urban contexts" from the 7th framework specific program cooperation.

The roadmap for the development of this first tentative plan for a follow-up project that builds on the EERQI achievements and takes them further relies on the following considerations:

- (i) *Research and capacity building in a European context: innovative ways of trans-national and trans-disciplinary research cooperation*

In a historical perspective, considerable parts of educational science were conceptualized as national, or even regional or local in scope. This was not least due to the fact that the national education systems were the major fields of reference for educational theory formation and knowledge building. Comparative education has developed as a sub-discipline that complements the national scope of education science. At present, however, it is obvious that neither the theoretical and practical problems which are addressed by educational science and research in general, nor the methodological approaches that are applied for solving such problems are related to national boundaries. Eminent parts of theory formation as well as empirical observation of

Work Package 11: Sustainability plan for maintenance of EERQI Framework

educational reality and the development of evidence informed practical solutions – even if they address regional or local phenomena – gain relevance, depth and validity by applying a transnational perspective, and often also: transdisciplinary approaches.

Consequently, international projects are emerging, not only in the field of large scale empirical projects (such as the PISA- or PIRLS-studies). A considerable growth of transnational and transdisciplinary exchange and collaboration is indicated, for example, by cooperative projects deriving from networks in learned societies such as the European Educational Research Association. This opens up the challenge not only to design and shape, but also to carry out educational research to a growing extent in an effective and transparent, affordable way of transdisciplinary and transnational European collaboration.

New information technologies offer a considerable potential in this respect, and national as well as European research policies encourage the development of technologies that effectively support respective research processes. The available solutions, however, are not convincing. According to expert judgment, they do not meet the aims of transparency and a sound relation of costs and benefits for the researchers.

The EERQI-results and products offer a unique starting point for the further development of a collaborative workspace, namely a prototype “virtual research environment”, for groups of educational scientists (and other SSH researchers in an inter- or trans- disciplinary perspective) in Europe. The envisaged consortium unites educational researchers and the respective experts from information technologies (in a broad sense). In a recent review of evaluations, Rittberger, Botte et al.⁸ stress the fact that effectiveness, functionality and acceptance of virtual research environments are strongly dependent on the participation of both, ‘technical’ partners and ‘users’ (here researchers), from the *beginning* of the development process. This was exactly the case in EERQI. Thus, the cooperation experience gained is a substantial capital for the planned follow-up project.

For the envisaged project, the virtual environment shall be a space that allows rehearsing for the reality of developing, submitting, assessing, carrying out and publishing transnational collaborative research. A team of excellent junior researchers (post grad, post doc) and experienced senior researchers will build an “academy” that is active on the “virtual research environment”. The call “INFRA-2012-3.3: Coordination actions, conferences and studies supporting policy development, including international cooperation, for e-Infrastructures” published in the Work Program of the FP7 specific program capacities, could address this endeavor.

⁸ Botte, A., Rittberger, M. & Schindler, C. (2011). Virtuelle Forschungsumgebungen: Wissenschaftspolitische Erwartungen, informationswissenschaftliche Forschungsfelder und Herausforderungen. In J. Griesbaum, T. Mandl & C. Womser-Hacker (Hrsg.), *Information und Wissen: global, sozial und frei?* (Schriften zur Informationswissenschaft, 58, S. 422-433). Boizenburg: Verlag Werner Hülsbusch.

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(ii) *Technical innovation*

The EERQI-products will be integrated as components into the development of an effective and efficient virtual research environment for educational research, with an outreach to other SSH fields. The basic workspace that allows for collecting relevant educational research (and further SSH) literature in at least three languages (English, German, French) from the Web with the EERQI multilingual search engine can be established immediately (making use of XEROX's XIP parser that was adapted for EERQI). The EERQI publisher partners agreed to the further use and development of the EERQI content base. The texts can be presented with extrinsic features provided by aMeasure and with the key sentences highlighted by application of automatic semantic analysis (XEROX). The relevant texts can be downloaded into a space accessible to network members.

The collaborative functionalities would be developed by a team including, other senior and junior educational researchers that are members of EERA, the EERQI 'technical partners' and new partners that already expressed their readiness to take part (e.g. the Knowledge Media Institute of the Open University UK with the "Cohere"-project; Mendeley).

The workspace will allow the following activities with reference to texts that are used for collaborative work on the basis of EERQI results:

- collection of educational research texts (printed and others) and texts of another SSH area,
- tagging / annotation of texts,
- establishment of various kinds of links,
- synthesizing the results of collaborative contributions,
- assessing the results of collaborative contributions,
- relatedness to specific research subfields by using their classifier,
- ongoing 'virtual' communication and exchange.

These activities will be integrated into a more comprehensive framework (responsible: DIPF) for a virtual research environment, including provisions for its reusability and sustainability. The gradual improvement of a knowledge base in the field of Educational Science will be one of the results. The envisaged framework will "provide core services (such as authentication and rights management; repositories; project planning, collaboration and communication tools) and allow the development or easy integration of modules for specific uses." [Carusi, Reimer 2010: 6, citation

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from Rittberger, Botte et al., op.cit.].

(c) The Network

The described scenario will be carried out by a core group of EERQI consortium members and some newly recruited partners with specific know-how. The transdisciplinary partnership will unite experts and institutions with the following profiles:

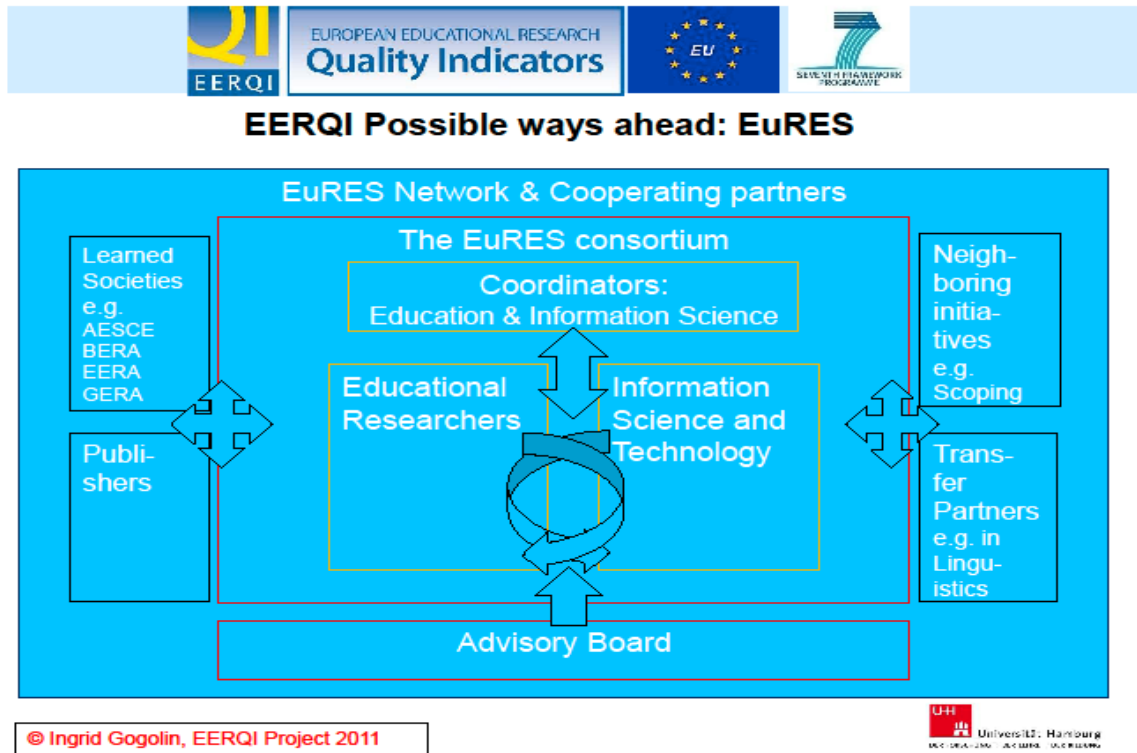
- educational researchers (junior and senior researchers) who are willing to work on 'the test case' and who will be collaborators, users and testers of the virtual research environment,
- information technology and technical partners for the conception and set up of the comprehensive technical framework, the interface, the integration of the tools and the evaluation of its functionality and acceptance.

Furthermore, cooperating partners are needed, such as

- learned societies,
- an advisory board,
- publishers as partners for printed data,
- 'neighboring' initiatives,
- researchers from another thematically related SSH area (e.g from the field of linguistics).

Work Package 11: Sustainability plan for maintenance of EERQI Framework

Figure 5: Illustration of EuRES-Network and potential consortium



Work Package 12: Transferability of Resulting Indicators to another SSH field

Summary of Progress

The aim of WP12 was to test the transferability of the EERQI framework developed for educational science to another social science or humanities discipline. DIPF was responsible for this work package; other partners, namely EARLI and HU-Berlin, were expected to support the work. As EARLI left the EERQI Consortium in 2009, EERA and UHambDE stepped in for EARLI's tasks.

The EERQI framework is based on a set of methodologies and their intelligent combination in a given assessment task. One of the research questions that were tested in EERQI concerned the cor- or interrelations between assessment results gained from the application of EERQI's 'intrinsic indicators' with results from the application of 'extrinsic indicators' represented e.g. by web mentions, usage statistics, alternative citation measures and data from online reference

Work Package 12: Transferability of Resulting Indicators to another SSH field

management systems (see WP 6). The target of this approach was to find answers to the question if a calibration measure of different weightings of the extrinsic components leads to results that resemble the judgments that are made on the basis of the intrinsic indicators. As reported in the WP 6 description, the different tests of this assumption led to negative result in the first attempts. It has to be mentioned though that these attempts were solely based on the testing of uni-variate and linear correlations between the two sets of indicators. A test of non-linear correlations (multivariate analysis) is still ongoing (responsible: UHambDE and ISN). The results of this further testing will have to be taken into account in future attempts of transferring the EERQI results to another SSH field.

The general hypothesis underlying the transferability exercise was that the flexibility of the EERQI framework – resulting from a wide range of information that derives from different document characteristics – would allow adapting the evaluation procedures of the EERQI framework to other contexts by taking into consideration the different publication cultures, languages and online affinity of the research in the field. On the basis of a report on characteristics of both disciplines (by the Project Management) the EERQI consortium decided that political science would be an adequate research area for this test.

In the final testing concerning the transferability of the EERQI framework to political science the following question was followed: Is it possible to transfer – at least important elements of – the EERQI Prototype Framework to publications from political science?

To obtain the data necessary for this experiment the Web crawler had to be adjusted to political science to harvest documents from the Web. As an integral part of aMeasure, the classifier also had to be trained to be able to discern political science documents from other research. 36 exemplary documents from political science were collected as well as the extrinsic indicators available for these documents. The planned evaluation of the process included a test with 36 documents which should be automatically ranked according to these criteria and be subjected to a peer review where six articles were judged by experts to see if the automatic ranking corresponded with peer judgments.

Results

Not all parts of this design could be carried out, due to the fact that the final results of WP 6 were not achieved earlier than February 2011. The following parts, however, could be achieved:

The search engine was adjusted to political science. The classifier was trained to discern political science documents from documents of other disciplines. The documents were collected from the

Work Package 12: Transferability of Resulting Indicators to another SSH field

Web and other sources. The EERQI-generic tool aMeasure was adapted to political science document assessment. The above mentioned methodology for a final testing of transferability was designed and is available for follow-up research.

The procedure and results were presented on a poster and discussed at the EERQI final conference and the deliverable “Guidelines for Transfer of EERQI Prototype Framework to other Social and Economic Sciences and Humanities” was prepared by DIPF.

With regard to the results of WP 6 (no univariate, linear correlations between the extrinsic and intrinsic indicators), two of three aims of WP 12 could be achieved:

- The tool aMeasure could be transferred to usage in political science.
- The questionnaire for the measurement of intrinsic indicators (Peer Review Questionnaire, WP 4) can also be used in the reviewing process of research articles in the field of political science.
- A research set was built, so future projects can search for multivariate and highly non-linear correlations between intrinsic and extrinsic parameters.

The methodology of transferring the EERQI framework to another discipline exists and all preconditions to test transferability have been established. Considering the gathered data and taking into consideration the very flexible framework of the EERQI quality assessment procedures, transferability seems highly probable.

Work Package 13: Final conference for researchers, funding agencies, demonstration of project results

Summary of Progress

The overall aim of this work package was the preparation and realization of a conference in which the final results of the project should be presented and critically discussed with the scientific community, the public and the European Commission.

The EERQI final conference took place on 15th-16th March 2011 in Brussels at the venue of the University Foundation.

The coordination and main workload of the conference organization was carried out by the project

Work Package 13: Final conference for researchers, funding agencies, demonstration of project results

office at UHambDE. EERA, IRDP/SSRE, UmU and DIPF supported the preparations. ISN contributed by providing a conference management system. All partners assisted in the program development, the evaluation of online registration systems and the advertisement of the final conference in the stakeholder's community (e.g. EERA: researchers, UmU: Swedish research council). Furthermore, the partners used their contacts to invite external speakers for the respective sessions.

During the sessions of the conference the EERQI partners presented the final results of the different their work packages, i.e. the EERQI products. This was followed by a general discussion and substantiated by a poster presentation.

Dr. Ian Perry (Principal Administrator, Social Sciences and Humanities, Directorate B, EC) gave an overview of EU Policy Initiatives related to Indicator Documents, the publishers contributed their point of view and at the final round table external experts discussed the impact of EERQI.

The respective sessions were moderated by IRDP/SSRE, DIPF and UmU.

Thinking about "possible ways ahead", the EERQI sustainability plan was presented by UHambDE and HU-Berlin and followed by an open discussion. The results were integrated into the final sustainability plan by UHambDE.

HU-Berlin provided technical support for the demonstration and presentation of the EERQI results.

Results

The agenda of the Final Conference as well as all its contributions (presentations and posters) presenting EERQI's final results can be found on www.eerqi.eu.

The general feedback to the presentations was very positive. The participants of the final round table stressed that the EERQI strategy of developing a set of approaches to quality detection that can be used for different purposes of an assessment process was highly appreciated. Different perspectives of possible technologies that can round out the EERQI Prototype Framework were envisaged. Many participants of the conference as well as the experts contributing to the round table expressed their interest and preparedness to take part in a possible follow-up project as outlined in the sustainability plan.

Work Package 14: Project Information and Dissemination

Summary of Progress

The goal of this work package was to develop and maintain a publicly accessible project Web site which provides all project information, reports, partner information, event calendars etc., as well as a forum for discussion of various topics which arose in the course of the project. The portal also serves as a means of making the EERQI products and all publications related to the project accessible to the public. Besides the publicly accessible part there is also a consortium-only accessible part (password protected) for internal exchange of information, overview of work package progress, deadlines, schedules, contact persons and an internal forum for each work package group as well as for the consortium as a whole.

The portal is technically maintained by ISN and runs on their hardware in Oldenburg.

User- and rights-management are connected to the LDAP on the EERQI server in Berlin and are coordinated by HU-Berlin.

UHambDE is responsible for the content and decisions regarding content types and the organization of intellectual content.

The EERQI portal is available in English, French and German. The translations were provided by IRDP (French) and UHambDE (Project Management, German).

Other means of dissemination were contributions to relevant conferences, in Europe as well as in other areas (e.g. Brazil, the USA, Singapore).

The EERQI Web site is linked by a number of other relevant Web sites (e.g.: www.eera.eu). Brief presentations of EERQI were provided for other Web sites, such as the site of the World Education Research Association (WERA). A moderate number of publications and reports were provided to the different publics that represent the interdisciplinary composition of the EERQI research team. Only a few of these appeared in so-called international highly recommended journals. This is due to a number of facts, most importantly: (a) There is hardly any such journal that covers the interdisciplinarity representing the aims and scope of the EERQI-project. (b) The most relevant EERQI-results were achieved in the final phase of the project. These are now transferred to publications, especially in journals in the field of educational research. The publication in these journals, however, has to anticipate a period of roughly one year between submission and appearance of articles.

Furthermore, reports on the project and its results were and will be delivered to European

Work Package 14: Project Information and Dissemination

Educational Research Associations. Not only the Associations that are EERQI members contribute to this way of information circulation, but also others, such as the German, the French, the Polish and Turkish. Moreover, other international research associations expressed their interest in the EERQI results, e.g. the Australian, Canadian, Mexican and several Asian Educational Research Associations.

Two means of dissemination belong to the EERQI sustainability plan: the publication of a book that presents all EERQI results (in preparation with VS-Verlag Germany, t.b.p. spring 2012) and an international conference on the further development of approaches to determine (educational) research quality. This conference is in preparation already; it will be carried out in cooperation with the President of the University of Hamburg, the Zeitschrift für Erziehungswissenschaft and the EERQI publisher partners, and take place at the University of Hamburg in December 2012.

Results

The EERQI portal is available on www.eerqi.eu. For all other aspects see respective overviews and WP 11.

Work Package 15: Project Management

Summary of Progress

The coordination of the project management is carried out by UHambDE. Concerning the structure of the project management and the tasks of the respective responsible persons please refer to Section 3.2.3.

Since the first interim report, the Scientific Coordinator established a regular project jour fixe that was carried out mostly in Hamburg (about once a month), in addition to meetings of the technical working group and other project meetings. Non-German project partners participated in the jour fixes according to demand via Skype or other telephone conference facilities. Moreover, a monitoring system for each work package was established and continuously updated with respect to the reality of the project progression.

The Scientific Coordinator established and kept up the contact and cooperation with relevant institutions and individual experts, e.g. the ESF, the European SCOPING Project, the German

Work Package 15: Project Management

Research Association and the Net4 Society.

The Scientific Coordinator and the Project Manager were supported in the project management (explained in Section 3.2.2) by partners which took over the following tasks:

- EERA supported the coordination of EERQI consortium meetings and organised EERQI presentations at EERA's Scientific Networks' meetings during the ECER conferences in Vienna, 2009 and Helsinki, 2010. The EERA Council and Networks took part in the process of recruiting peer reviewers for the testing of the EERQI indicators. Moreover, EERA supported the dissemination processes via submitting EERQI information to presenters to the ECER conferences. Last but not least, EERA organised job interviews for management and other staff employed by the EERQI project.
- Radboud-NL supported the project coordination by providing suggestions for the conceptual framework to construct the EERQI project and for the construction of the EERQI Prototype Framework, including suggestions for the task distribution in the consortium.

External Audit

By Request of the European Commission an audit was carried out in March/ April 2011 for EERQI's 1st reporting period (01/04/2008 to 30/09/2009) in which 238,975.07 Euro were claimed. The independent Auditor found the financial statement to properly reflect eligible costs except for a sum of 408.85 Euros. Those costs are adjusted, in favour of the commission, at the end of EERQI's 2nd reporting period.

2.3 Project management during the period

The EERQI project management consists of the following bodies. During the course of the project their tasks were refined with respect to the actual needs of coordination, cooperation and decision making. It now consists of:

- the Advisory Board,
- the General Assembly consisting of one elected representative of each EERQI partner,
- the Scientific Coordinator,
- the Technical Coordinator,
- the Project Manager supported by the project office,
- the Work Package Leaders.

The **Advisory Board** consists of international experts that represent the range of interdisciplinary competences that are integrated in the EERQI project. The board members were invited to all major EERQI events and consulted by individual project partners when necessary. A list of its members is attached to this section.

The **General Assembly** is the ultimate decision-making body of the EERQI Consortium. It met regularly, mostly in the context of the EERQI workshops. Its main tasks were the review of the project progress and the approval of any changes to the original proposal as it was negotiated with the EC. The General Assembly approved the exclusion of EERQI-partner EARLI from the project and discussed and decided on the consequences of this development regarding the distribution of work among the remaining partners.

The **Scientific Coordinator** is located at the University of Hamburg, Department for International Comparative and Intercultural Education (Prof. Dr. Ingrid Gogolin). She oversees all activities of the project. Her responsibilities included routine activities such as the monitoring of the information flow and the documentation of the project progress, the submission of reports and contact with the European Commission. Furthermore, the Scientific Coordinator took over representative functions such as developing and keeping up contact with relevant European and international institutions and stakeholders in the area of quality determination. She represented the project at different international meetings and conferences and reported the results back to the EERQI partners.

More than expected, the Scientific Coordinator had to take over responsibilities as Principal Investigator. As a consequence of EARLI's withdrawal from the EERQI project, the

coordination and scientific supervision of the development and testing of 'intrinsic quality indicators' was transferred to her portfolio, as well as the validation process of the EERQI Peer Review Questionnaire.

The **Technical Coordinator** is located at the Berlin School of Library and Information Science at the Humboldt University of Berlin (Prof. Dr. Stefan Gradmann). He is responsible for all technical activities within the project, for the provision of a cross work package monitoring system, as well as a communication line. His main functions are to maintain the advancement and flow of the technical progress and support the development of optimal working environments within the technical aspects. A technical working group has been set up.

The server for the EERQI content base is hosted at HU-Berlin and supervised by the Technical Coordinator.

The **Project Manager** is located at the University of Hamburg, Department for International Comparative and Intercultural Education (Virginia Moukouli). The Project Manager has organizational and coordination tasks with respect to the information and communication in the project, the general workflow, the communication with the scientific officer and other relevant partners in Brussels. She acted as a link between the scientific tasks of the project and the different levels of administrative tasks. She arranged for and chaired meetings of the project consortium and subgroups and took responsibility for minutes and reports. She supported the public relation and dissemination activities of the project, e.g. by publishing project portraits in member magazines of the European educational research associations. Moreover she represented the project in relevant meetings and conferences and reported back the results to the project partners. Part of her portfolio was also to prepare for the sustainability plan of the project.

The Project Manager was also responsible for the administration of the project in line with its contractual obligations. She collected the cost statements and scientific reports of the partners for submission to the European Commission and supervised the reception and transfer of the EC financial contribution to the partners. Project meetings, deadlines, deliverables etc. were captured in a project management programme on the protected Web site which she updated regularly.

Due to the heavy workload the Scientific Coordinator and the Project Manager were supported by the project office which assisted in organisational and administrative tasks.

Also the University of Hamburg (financial department) provided administrative support as well as facilities such as rooms, telecommunication equipment, etc.

The individual work packages were coordinated by the respective **Work Package Leader**. They kept close contact with the Scientific Coordinator and the Project Manager at the central project office to update, maintain and monitor the schedules and work progress of the individual work packages. The individual Work Package Leaders are responsible for the achievement of the work package's goals such as meeting deadlines and schedules. Individual reports, deliverables and milestones resulting from the various work packages were prepared by the work package participants and overseen by the respective Work Package Leader. These were submitted to the Project Manager and the Project Coordinator.

Problems which have occurred and how they were solved or envisaged solutions

After the 1st EERQI Workshop in Leuven, 2008, the project partners realised that more face-to-face project meetings were necessary to manage project activities. Therefore, the consortium agreed to organise more project meetings than initially scheduled in the project application (a Kickoff meeting, two Workshops, and a Final Conference were initially planned). A list of the additional project meetings held in the second reporting period is attached below.

Changes in the consortium

Partner No. 14, EARLI, left the consortium by the end of the first reporting period. EARLI's original tasks were the work package leadership of WP4 and the support of the organisation of several project meetings.

The further specification of new scientific quality assessment indicators and methods for the detection of research quality in scientific publications (WP4) were taken over by UHambDE and EERA. EARLI's tasks in the organisation of the project meetings were also taken over by the Project Management at UHambDE and EERA.

List of project meetings, dates and venues in the reporting period

EERQI Meeting in Grenoble: 22nd January 2010

Venue: Xerox Research Centre Europe, Grenoble, France

EERQI Meeting and General Assembly Hamburg: 18th and 19th March 2010

Venue: Hamburg University, Germany

EERQI meeting @ ECER Helsinki: 27th August 2010

Venue: University of Helsinki, Finland

EERQI Second Workshop (and General Assembly) in Geneva: 17th and 18th September 2010

Venue: University of Geneva, Switzerland.

EERQI Meeting and General Assembly Hamburg: 26th November 2010

Venue: University of Hamburg.

EERQI Final Conference Brussels: 15th and 16th March 2011

Venue: University Foundation

Any changes to the legal status of any of the beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs:

EERA, BERA and EARLI changed their legal status from being a public body to a non-profit organisation. In fact, they are all non-profit bodies carrying out services for researchers and being an umbrella organization for researchers but not conducting research themselves. Thus their funding rate changed from 75% to 50% for RTD activities.

ISN is an SME and was registered as such at the beginning of the project in the URF database. However this status was changed by technical error in the database during the course of the project. For ISN being an SME, they provided the necessary documents to prove their status. Thus their funding rate didn't change.

IRDP is a research organization (thus being eligible for the 75% funding rate for RTD activities) but by mistake stated the simplified method as ICM. This was changed to a 60% flatrate.

TU/e has used the actual indirect cost model as ICM since the beginning of FP7. By mistake their indirect costs were calculated with the 60% flatrate. This was corrected to actual indirect costs.

Communication between beneficiaries

The communication between the EERQI beneficiaries was safeguarded in multiple ways: via technical means (internal space on the EERQI website; regular skype meetings and telephone conferences) as well as in face-to-face meetings. The Scientific Coordinator, the Technical Coordinator and the Project Management ensured that most of the face-to-face meetings could serve several functions, such as the combination of a presentation of EERQI to the scientific community during a conference and an EERQI internal workshop. Sub-groups of the Consortium, such as the group of technical partners, held extra meetings. Although the number of face-to-face meetings was raised considerably in the course of the project, the Consortium felt the need to meet even more often. This is not least due to the fact that the diversity of 'research cultures and languages' that were gathered in the EERQI team meant a challenge for the development of a joint understanding of research problems

and their possible solutions when the project evolved. For a follow-up project we have learned that density and intensity of communication will have to be raised and that technical devices which help to come as close as possible to face-to-face meetings are an urgent need.

Co-operation with other projects/programmes

A lot of activities were carried out by the Scientific Coordinator, the Project Manager, the Technical Coordinator as well as individual members of the team to co-operate and exchange experiences with other projects and programmes. Examples for this are the participation in events that were arranged by the Net4Society, by national and international publisher and open access associations (such as the 'Berlin6-Conferences'), by neighbouring projects such as SCOPING and the Swiss Project 'Research Quality in the Humanities' and last but not last by associations of relevant stakeholders such as the Coimbra-Group or the German Research Foundation. All these encounters and EERQI's contributions to them led to relevant feedback that was immediately taken up by the research consortium. Cooperation with some of the mentioned institutions was launched, for example mutual contributions to publications, exchange of speakers to further events. A number of experts that were present at the mentioned occasions expressed their interest in participation in the EERQI follow-up project (see WP 11).

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3. Deliverables and milestones tables

3.1. Deliverables

Table 1.1 Table 1: Deliverables									
Del. no.	Deliverable name	WP no.	Lead beneficiary	Nature	Dissemination level	Delivery date from Annex I	Delivered Yes / No	Actual Delivery date	Comments
1a	Initial Version: Prototype Search and Query Engine	5,6,8,9	RRZN, HU-Berlin, YEROX	P	PU at end of project	10/08	Yes	10/08	
1b	Final Version: EERQI Prototype Search and Query Engine	5,6,8,9	RRZN, HU-Berlin, YEROX	P	PU	03/11	Yes	03/11	Due in P2
2a	Initial Version: EERQI Prototype Research Quality Indicators	4,6,10	UHambDE	P	PU	09/08	Yes	09/08	
2d	Final Version: EERQI Prototype Quality Indicators	4,6	UHambDE, EERA, HU-Berlin	P	PU	02/11	Yes	03/11	Due in P2
3a	Initial Version: EERQI Text Analysis Methodology	6	HU-Berlin, XEROX	P	PU	09/08	Yes	10/08	
3b	Final Version: EERQI Text Analysis Methodology	6	HU-Berlin, XEROX	P	PU	03/11	Yes	03/11	Due in P2
4	EERQI Sustainability Plan	11	UHambDE	P	PU	03/11	Yes	03/11	Due in P2

5a	Initial Version: EERQI Project Portal	14	ISN, UHambDE	P	PU, RE	06/08	Yes	06/08	
5b	Final Version: EERQI Project Portal	14	ISN, UHambDE	P	PU, RE	03/11	Yes	03/11	www.eerqi.eu Due in P2
6	3 Project Reports: 2 Periodic Report, 1 Final Report	15 (4,10, 13)	UHambDE	R	PU, RE	03/09 03/10 03/11	Yes	---	Due in P2
7	EERQI Policy Briefs	15	UHambDE	R	PU, RE	09/08 03/09 09/09 03/10 09/10 03/11	Yes	09/08 04/09 10/09 04/10 10/10 04/11	Due in P2
8a	Initial Version: Project Brochure	15	UHambDE	R	PU	04/08	Yes	06/08	
8b	Final Version: Project Brochure	15	UHambDE	R	PU	03/11	Yes	03/11	Due in P2
9	Guidelines for Transfer of EERQI Prototype Framework to other Social and Economic Sciences and Humanities	12	DIPF	P	PU	02/11	Yes	04/11	Due in P2
10	Final Conference to present and disseminate EERQI Results	13	EERA, UHambDE	O	PU	01/11	Yes	03/11	Due in P2

3.2. Milestones

Table 1.3. Milestones						
Milestone no.	Milestone name	Work package no.	Delivery date from Annex I	Achieved yes/no	Actual / Forecast achievement date	Comments
1	Project Website	14,15	04/08	yes	04/08	
2	Initial overview of educational resources	1,2,5	06/08	yes	06/08	
3	Preliminary content base with publishers' data and other data	1,5	06/08	yes	06/08	
4	Overview of existing research quality indicators§	3	06/08	yes	06/08	
5	Internal Project Website	14,15	06/08	yes	06/08	
6	Workshop 1	3,4	07/08	yes	07/08	
7	New Set of Research Quality Indicators	3,4	08/08	yes	08/08	
8	Successful search engine functionality	5	08/08	yes	08/08	
9	Content storage, access and IPR contracts	1,7	08/08	yes	08/08	
10	Internal Communication System for Consortium	14	06/08	yes	06/08	
11	Aggregate content base complete except for updates	1,5,6	12/08	no	12/08	The attempt to achieve full coverage of all printed and electronically available European educational research publications was made, but it turned out that the amount of publications would be too large to achieve this aim. Thus, a procedure of selection was developed: (a) concentration on printed publications from specific years; (b) concentration on publications from three areas of educational research, namely 1.) Assessment, Evaluation, Testing & Measurement, 2.) Comparative & Intercultural Education and 3.) History & Philosophy of Education

12	Testing phase begins, research implementation and prototyping operations	6,8	08/08	yes	08/08	
13	Half-way mark in testing	5,6,8,9	09/09	yes	09/09	
14	Completion of refinements to query engine	5, 6, 8, 9	09/10	yes	09/10	
15	New indicators set and methodologies ready for presentation & verification by scientific field	6, 8, 9, 10	09/10	yes	09/10	
16	Workshop 2 Report – Presentation to and validation by scientific community; demonstration of proof of concept through transfer of methodology to another social science field	10, 12	11/10	yes	17.-18.9.2010	
17	Presentation / Discussion of preliminary sustainability scenarios	11	11/10	yes	03/11	
18	Final Workshop to present EERQI results to public	13	02/11	yes	02/11	
19	Guidelines for transferring EERQI indicators & methodologies to other social science fields	12	04/11	yes	04/11	
20	Successful completion of the EERQI Project	all	04/11	yes	04/11	

21	Presentation of viable sustainability plan, possibly proposing an organisational framework	11	04/11	yes	04/11	
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