

Quality assurance standards for e-ASEM OER in open and distance learning

URL	http://weko.wou.edu.my/?action=repository_uri&item_id=388
-----	---



Quality Assurance Standards for e-ASEM OER in Open and Distance Learning

Taerim Lee

Korea National Open University

Insung Jung

International Christian University, Japan

Abstract

This paper briefly outlines the development of open educational resources (OER) in the contexts of ODL in Asia and Europe. It then brings up quality issues of OER and highlights the need for the present study.

OER is an online education defined as the self-paced or real time delivery of training and education over the Internet to an end user device with free of charge. In view of OER it has many advantages such as reduction of education cost, repeated learning, customised education, and self-paced learning. OER system for open and distance learning has improved the lack of two-way communication and repetition and extended the opportunity of learner by operating a variety of curriculum on the basis of e-learning.

This paper describes the quality assurance for open educational resources that anyone who wants to study could study anywhere, anytime with the Internet. In the context of increasing these new forms of cross-border provision of education, national and international quality assurance of OER became an issue. Given the best quality of materials does not automatically induce learning and especially in e-learning. Quality standards, for providers and receivers, are an issue that is involved in learning and teaching. Compare to conventional learning materials, OER could be explicit that it works in favour of quality.

The guideline and evaluation criteria of quality assurance of OER was considered for each developing process of analysis & planning, design & development, implementation and evaluation. A set of QA standards should be developed across such QA areas as Infrastructure, Quality Assurance, Institutional Vision & Support, Finance & Partnership, OER Development, Learning Content, Learning Support, Online Features, Learning Outcomes, Return on Investment, and Research & Development.

For Asian ODL institutions and educators, we recommend giving a high priority to the seven QA standards as they are perceived as more important than other standards by Asian educators and learners.

Keywords: Quality assurance, OER, ODL, QA standards

Introduction

Development of Open and Distance Learning

As the development of ODL as a flexible means of widening access to education in various regions including Asia and Europe and at various levels is well documented¹, a very brief outline is offered here.

Over the past years, tremendous growth and diversity in ODL and a wide spread of e-learning have been observed in the Asia-Europe Meeting (ASEM) countries².

As the world's largest and most populous continent with over 60 percent of the global population, Asia has over 70 open universities that are engaged in open access to education serving over six million distance learners, a growing number of dual-mode universities (offering both face-to-face and ODL) that serve both conventional campus-based students and distance learners, and several virtual universities that offer online education to mainly working adults. All these institutions are expanding Asian higher education in ways never before possible.

In Europe, since the launch of the Open University of the UK (OUUK) in 1969, several open universities were established in the Netherlands, Germany, Spain, Turkey, Greece, Italy, Norway and Cyprus. Since the inception of the Bologna Process in 1999, several virtual universities and e-learning programs have been created as well. These institutions are serving millions of students located in Europe and other regions.

The advancement of ODL and e-learning in Asia and Europe has been strengthened via several professional networks and associations such as the Asian Association of Open Universities (AAOU), the South East Asian Ministers of Education Organization Regional Open Learning Center (SEAMEO-SEAMOLEC), the South Asian Association for Regional Cooperation (SAARC) Consortium on Open and Distance Learning (SACODiL), the European Distance and E-Learning Network (EDEN), and the European Association for Distance Learning (EADL).

ODL Technologies and Open Educational Resources

ODL institutions have been using a variety of technology tools to serve their learners studying in diverse learning contexts, and recently many of them have adopted digital technologies such as the Internet and multimedia resources and embraced e-learning, virtual programs or online courses in their education. With the expanded availability of new digital technologies, these institutions have also created and embedded a range of digital resources including OER in their courses.

Dhanarajan and Abeywardena (2013) argue that OER has been promoted by advocates around the globe as one viable solution to address some of the challenges of access, quality and cost in higher education. In both Asia and Europe, a number of OER movements or projects have been initiated

in several countries even if the creation and implementation of OER is slow in the less developed parts of those regions. Selected OER projects will be reported in the next section.

¹Evans, T., Haughey, M., & Murphy, D. (Eds) (2008), International Handbook of Distance Education. San Diego, CA: Emerald. Latchem, C. & Jung, I.S. (2009). Distance and Blended Learning in Asia. New York & London: Routledge ²<http://www.aseminboard.org/members.html>

Definitions

Several definitions of OER have been proposed as follows:

- “Open educational resource(s)’ (OER) refers to educational resources (lesson plans, quizzes, syllabi, instructional modules, simulations, etc.) that are freely available for use, reuse, adaptation, and sharing.” (Wiley, 2008)³
- OER is resources that are “openly available for use by educators and students, without an accompanying need to pay royalties or license fees.” (Butcher, 2011, p. 5)
- "Open educational resources are materials used to support education that may be freely accessed, reused, modified and shared by anyone." (Downes, 2011)⁴
- “Open Educational Resources (OERs), are educational materials which are licensed in ways that provide permissions for individuals and institutions to reuse, adapt and modify the materials for their own use.” (OER Foundation, 2013)⁵

Expanding on these definitions, McGreal (2013) introduces a more detailed definition of OER in his edited book supported by the Commonwealth of Learning.

- “Open Educational Resources (OER) are free learning resources available on the Internet. OER can be openly licensed or in the public domain, and can be used or reused for free.” (p.2)

In the abovementioned definitions, “openness” is a common feature of OER even if each definition highlights a slightly different element of openness. For example, Wiley’s definition highlights free availability of OER whereas Butcher’s one pays attention to licensing issues of OER. Other definitions such as Downes’s emphasize free access, reuse, modification and sharing of OER.

In fact, OER can take a variety of forms text, audio, video, multimedia, or various combinations of these. OER can cover a short learning unit, a lesson or a series of lessons within a course, or a whole course. It can be even an entire program of study. They can be used to support different pedagogical approaches including behaviorism, constructivism, cognitivism, and/or connectivism. Creative Commons, a nonprofit organization that releases Creative Commons licenses free of charge to the public, categorizes OER into three types: individual, semi-structures, and highly structured OER⁶. Follows are the summary of the explanation of each type offered by Creative Commons.

Types of OER

³http://wikieducator.org/OER_Handbook/educator_version_one/Introduction/Defining_OER

⁴<http://halfanhour.blogspot.jp/2011/07/open-educational-resources-definition.html>

⁵http://wikieducator.org/WikiEducator:OER_Foundation/FAQs/Open_Education_Resources/

⁶http://wiki.creativecommons.org/Free_to_Learn_Guide/Different_Types_of_OER_Meet_Different_Needs

Individual OER have little or no interlocking structure and thus this type of OER can be used individually, or combined with other types of OER or used in various pedagogical contexts. They are often called “learning objects” which refer to digital resources that can be used and reused to support learning.

- Learning objects include a word or a concept, a table, an illustration, an interactive diagram, a set of test items, a simulation program, and other forms of online content that support students' learning of a particular point or principle. Educators can integrate learning objects into their lesson, course or curriculum to create a more comprehensive learning environment. Learners can use learning objects to get information or develop a better understanding on a specific topic. Examples of learning object repositories are: Rice University's Connexions⁷, the Institute for the Study of Knowledge Management's (ISKME) OER Commons⁸, MERLOT II⁹, and OUUK's OpenScout¹⁰.

Semi-structured OER include open digitized library collections and open encyclopedia that can be used effectively as reference materials.

- Open digitized library collections provide source and reference materials such as books, magazines, catalogs, posters, photographs, professional journals, and other periodicals and manuscripts, which can be freely used and repurposed by educators and students for their teaching, learning and research. Examples of digitized library collections include: Khan Academy¹¹ that offers a collection of tutoring video clips, and Public Library of Science (PLOS)¹² which publishes seven peer-reviewed open-access journals in the fields of biology and medicine.
- Open encyclopedias are reference materials that comprise descriptions or articles on a wide range of topics or on various aspects of a particular field. These OER can be used by educators and learners in conducting research, and finding and verifying information. Examples of open encyclopedias include: Wikipedia¹³ in which entries are created by the public and maintained by teams of volunteer experts, Stanford University Encyclopedia of Philosophy¹⁴ which invites subject matter experts to create entries, and Canadian Theatre Encyclopedia¹⁵ which invites entries from the public and gate-keeps by experts.

Highly structured OER include open textbooks and open online courses such as Massive Open Online Courses (MOOCs). This type of OER can be used as they are, modified to meet diverse learning

⁷<http://cnx.org/>

⁸<http://www.oercommons.org/>

⁹<http://www.merlot.org/merlot/index.htm>

¹⁰<http://learn.openscout.net/about.html>

¹¹<https://www.khanacademy.org/>

¹²<http://www.plos.org/>

¹³<http://www.wikipedia.org/>

¹⁴<http://plato.stanford.edu/>

¹⁵<http://www.canadiantheatre.com/>

needs or styles, or adopted to create new textbooks or courses.

- Open textbooks include both traditional textbooks that have been made available online and new books created by educators as free sharable textbooks. Examples of open textbooks include: The Community College Consortium for OER provides free open textbooks¹⁶ across various disciplines that are easy to use and editable and customized to meet individual users' purposes.
- Open courses refer to instructional materials such as syllabi, lecture notes, texts, readings, course assignments, study materials, practice items, exams, and video lectures that are used to teach a specific course. Examples of open courses include:

MIT's OpenCourseWare (OCW)¹⁷, iTunes U's free courses¹⁸, and OUUK's OpenLearn¹⁹.

Quality Issues of OER

While these OER developments offer promises of open access, improved quality, and reduced cost in higher education, higher education institutions (HEIs) still face several challenges in OER use. Among various challenges such as lacking educator competencies to effectively search and locate relevant OER from various sources (Abeywardena, Dhanarajan, & Chan, 2012; Yergler, 2010), the difficulty of finding desirable OER that match with a specific context (Dichev&Dicheva, 2012) and lack of awareness of copyright issues (Hylén, 2005), quality assessment of OER is indicated as one of the major barriers to OER development and implementation.

There have been a few studies to develop QA criteria for OER. For example, Kernohan (2012) suggests three areas for QA in OER: technical/legal, academic, and pedagogic, and argues that effective OER should demonstrate high quality in all three areas. Similarly, Vladoiu (2011) offers a set of QA criteria for quality assessment of OER in four categories: content related, instructional design related, technology related and courseware evaluation. Several non-profit organizations such as MERLOT II, Achieve²⁰, temoa²¹, and Commonwealth of Learning²² have also suggested QA criteria for OER use in teaching and learning. However most of these QA guidelines and standards have focused on individual educators' or learners' use of OER and thus have not paid enough attention to institutions' needs for QA in OER development and use.

OER Development in Asia and Europe

¹⁶<http://oerconsortium.org/discipline-specific/>

¹⁷<http://ocw.mit.edu/index.htm>

¹⁸<http://www.apple.com/education/ipad/itunes-u/>

¹⁹<http://www.open.edu/openlearn/>

²⁰<http://www.achieve.org/>

²¹<http://www.temoa.info/>

²²<http://www.col.org/>

In this section, we examine the current status of OER development in Asia-Pacific and European regions by analyzing several cases.

Asia-Pacific OER Projects

After analyzing a regional survey data on perceptions and practices in OER in Asian higher education, Dhanarajan and Abeywardena (2013) conclude that “interest in and the production, distribution and use of OER are still very much in the early stages of development in most parts of Asia” (p. 17).

However, they also note that despite low level of awareness of OER and even lower level of creation and utilization of OER, there are a number of ongoing national and institutional initiatives throughout Asia. Their recent report introduces a wide range of OER development and implementation cases from India, China, Pakistan, Indonesia, Korea, Vietnam, Malaysia and the Philippines. So in our report, we won't introduce these cases as they are readily available online²³. Instead we will focus on three most recent cases of OER development in the AP region: OpenCourseWare movements in East Asia, Australia's and the recent establishment of the OER university (OERu).

Open Course Ware movements

China's OER use in universities has begun in 2003 when Chinese Open Resources for Education (CORE)²⁴ was established. As a non-profit consortium of conventional universities and provincial-level radio and TV universities, CORE aims to introduce high quality open courseware from top-ranked universities around the world including MIT in pursuit of improving the quality of higher education in China and eventually produce Chinese open resources to share with universities in other countries. Among a total of 2,689 HEIs in China, a little over 100 universities including Tsinghua University, Peking University and Shanghai Jiaotong University have joined CORE. As a way of promoting OER application in the universities, CORE has translated MIT Open Course Ware and other OER into Chinese.

This kind of OER activities has been supported by the national government. In 2003, Chinese Ministry of Education set up a policy on OER and action plans for OER development and QA (Hoosen, 2012) including the China Quality Course²⁵ program. This program invites open online course submissions from university instructors with grants of up to \$15,000 per course that should be open to the public. According to the **China Quality Course** website²⁶, over 20,000 online courses developed by Chinese university instructors are freely available on the web.

However, despite of the rapid growth of OER development, Li and Li (2013) revealed in their survey with faculty and administrative staff of the CORE member institutions that over 67% of

²³<http://www.col.org/resources/publications/Pages/detail.aspx?PID=441>

²⁴<http://www.core.org.cn/en/>

²⁵<http://www.moe.gov.cn/publicfiles/business/htmlfiles/moe/s3843/201010/109658.html>

²⁶<http://www.jingpinke.com/>

the survey participants did not engage in OER development and over 70% did not use OER due to such reasons as lack of awareness, lack of skills to locate quality OER for their courses, lack of incentives and lack of interest, which led them to conclude that the impact of OER on Chinese higher education is still minimal.

Japanese OER use in HEIs has begun with the establishment of Japan OpenCourseWare Consortium (JOCW)²⁷ in 2005. JOCW began with six universities. As of 2013, JOCW has 22 universities, 3 non-profit organizations, and 12 companies as its members. Considering a total number of 1,244 HEIs in Japan, OER movement has been quite slow. However those JOCW member institutions have actively developed open courses and as a result 1,497 courses (1,285 in Japanese and 212 in English) were available online in 2010 (Yamada, 2013). Recently Japan Massive Open Online Courses (JMOOC) was established in October 2013 to pursue MOOC development and diffusion across Japan and other Asian countries.

Similar to China's case, the Japanese government has also promoted the development and sharing of high quality course content via several national level initiatives. However, unlike China, it has not established a national level policy on OER.

Lack of awareness, lack of appropriate search skills on the part of educators, lack of organizational support, and lack of incentives appear to be the major barriers in OER development and uses in Japanese higher education (Fukuhara, 2008; Yamada, 2013).

South Korea's OpenCourseWare²⁸ service began in 2007 and has been supported and managed by Korea Education Research Information Service (KERIS)²⁹, a government-supported organization which promotes education and research through the use of ICT. As of 2012, KOCW offers 3,390 online courses in Korean, 402 OER in English, and 21,114 educational resources. While we observe rapid growth of OER in Korea's higher education via numerous initiatives including KOCW, a limited number of studies have been conducted to gauge actual uses of OER in higher education. In a survey with 111 university educators, Park (2010) found that around 60% of educators from humanities and social sciences, 34% from natural sciences, and 5% from arts and physical education utilized various types of OER in their courses. Kim (2013) surveyed 61 educators and revealed that over 70% had experience in using OER in their teaching. These figures show that OER is more widely used in Korea's HEIs compared with their counterparts in China and Japan. However caution is needed in interpreting these results due to a small number of survey participants.

As for the barriers to OER adoption, again lack of awareness, lack of appropriate competencies and lack of support from management were indicated as most serious barriers to OER use. Kim (2013) also pointed out that two most important challenges for OER development are resolving copyright issues and assuring the quality of OER produced by university educators.

OER development in Australia

²⁷<http://www.jocw.jp>

²⁸<http://www.kocw.net/home/index.do>

²⁹http://english.keris.or.kr/es_ak/es_ak_100.jsp

As Hoosen (2012) concluded, Australia appears to be pretty active in developing and using OER even though there are no national or state-level policies on OER. Especially the Australian government has supported several initiatives including:

- the development of Open Access and Licensing Framework (AusGOAL)³⁰, which aims to provide “support and guidance to government and related sectors to facilitate open access to publicly funded information” (AusGoal, 2013, Overview)
- the Australian National Data Service (ANDS)³¹, a research database produced by research institutions in Australia;
- the National Digital Learning Resource Network (NDLRN)³², a national repository of several thousand digital teaching and learning resources for teachers, students and parents.
- Scootle³³, the national repository of open digital learning resources for teachers and schools across Australia.

Some Departments of Education in such states as Government of South Australia, New South Wales and Western Australia have developed digital teaching and learning resources and made them available under Creative Commons License, and offered OER training for teachers (Hoosen, 2012).

The OER university (OERu)

OERu was established in October 2013. It is led by New Zealand's Otago Polytechnic which has adopted an OER policy earlier than other HEIs in the country, coordinated by the OER Foundation³⁴ and supported by UNESCO and Commonwealth of Learning. In particular, the OER Foundation has been playing a key role in the development of OERu. The OER Foundation is a non-profit company founded in 2009 under the New Zealand Companies Act, and Otago Polytechnic is a sole shareholder of the OER Foundation.

European Projects

OpenLearn

OpenLearn³⁵, launched in 2006 as an Open Content Initiative of The Open University UK (OUUK), aim to offer freely available higher education learning content on the web. Several studies (e.g. McAndrew, 2006; Mikroyannidis&Connolly, 2012; and Wilson, 2007) have analyzed and discussed possibilities, usages and challenges of OpenLearn.

³⁰<http://www.ausgoal.gov.au>

³¹<http://www.and.s.org.au/index.html>

³²<http://www.ndlrn.edu.au/default.asp>

³³<http://www.scootle.edu.au/ec/p/home>

³⁴<http://wikieducator.org/OERF:Home>

³⁵<http://www.open.edu/openlearn/>

As of 2013, OpenLearn offers over 650 courses across a wide range of subject matters and in a variety of formats, from interactive materials, games, video, podcasts and articles. Those materials include resources repurposed as OER from OUUK courses and new OER created for OpenLearn itself (Mikroyannidis & Connolly, 2012).

OpenCourseWare Europe

With a growing interest of European universities in OER and OCW, OpenCourseWare Europe³⁶ or OCW EU, a consortium of European higher education institutions and a project to promote OCW development and adoption among European institutions was launched in 2011 as a sub-project of European Commission's Erasmus Multilateral Project by several universities in Europe. OCW EU focuses on the creation of supportive conditions for a strong European OCW-framework and cooperation between European higher education institutions (OCW EU Project Team, 2012).

Open Education Europa

Open Education Europa³⁷ is an EU-wide initiative to promote innovative ways of teaching and learning via ICT in general and OER in specific. Its portal site allows European universities to use and share OER, and promotes collaborative projects and research. Currently it lists over 370 free courses and around 400 MOOCs that are created by several European institutions or as result of OER initiatives, and offers many other written resources and papers related to OER. It also supports discussion blogs.

Open Educational Resources in Europe (OEREU)

OEREU launched in 2013 to offer research evidences and guidelines on how to support and promote OER use in various open and flexible learning contexts to policy makers and stakeholders of school education, higher education and adult education. It aimed to critically assess existing OER initiatives and projects in Europe, develop future scenarios for maximizing the benefits of OER use in education, conduct a survey on OER use in education in Europe, and identify challenges with OER use and offer recommendations for further development of OER in Europe (Punie&Haché, 2012).

OER and Quality Assurance

This section discusses benefits and challenges of OER and highlights quality-related issues. It then reviews a wide range of QA models developed and used in different regions of the world.

Benefits and Challenges of OER

³⁶<http://www.opencourseware.eu/>

³⁷<http://openeducationeuropa.eu/en>

Several studies have shown that OER offer many advantages to HEIs and their members including educators and students.

Institutional level benefits include: assisting cost reduction, improving quality, and bringing innovations to conventional materials (e.g., Caswell, Henson, Jensen, & Wiley, 2008); and assisting HEI leaders and managers to bring pedagogical changes in HEIs and using OER as promotion tools (e.g., Bossu, Brown, & Bull, 2012).

Some benefits of OER for faculty include: accessing to glowing resources that can be used for content updates (e.g., Bossu&Tynan, 2011); sharing own OER and promoting one's own academic work to the global community (e.g., Open.Michigan, 2013); and reducing teaching preparation time and avoiding duplication (e.g., Willems&Bossu, 2012).

Major benefits of OER for students and independent learners include: offering flexible and open opportunities to study anywhere and anytime at no or low costs (e.g., Kanwar, Kodhandaraman, & Umar, 2010); providing supplemental learning materials for courses, independent study, and professional development (e.g., Bossu&Tynan, 2011; Open.Michigan, 2013); and sharing knowledge with other learners, getting support for one's own personal learning goals and encountering different points of view (e.g., Panke, 2011).

To serve the purpose of this report, we will focus on QA frameworks in the following sections.

OER Quality Assurance Models

With the rapid growth of online learning in higher education, QA has been recognized as a key issue that needs to be addressed not only within individual institutions, programs or courses but also jointly in national, regional and global contexts. As a result, several QA policies and guidelines have been developed. In this section, we will introduce a few well-known institutional level QA frameworks for ODL including online learning that could be utilized in creating QA standards of OER in the ODL context based on a report produced by Jung and Latchem (2012), and QA criteria developed specifically for OER.

Models from Asia and Pacific

The Australasian Council on Open, Distance and E-Learning (ACODE) Benchmarks³⁸ were developed by this organization whose mission is to enhance policy and practice in open, distance, flexible and e-learning in Australasian higher education. They are designed to support continuous quality improvement in e-learning. They have been developed for use at the enterprise level or by the organizations responsible for the provision of leadership and services in e-learning. They have been piloted in universities and independently reviewed.

Each benchmark area is discrete and can be used alone or in combination with others. The benchmarks can be used for self assessment purposes (in one or several areas), or as part of a collaborative

³⁸<http://www.acode.edu.au/>

benchmarking exercise. ACODE benchmarks³⁹ cover the following eight separate areas which have been internationally reviewed:

1. Institution policy and governance for technology supported learning and teaching.
2. Planning for, and quality improvement of the integration of technologies for learning and teaching.
3. Information technology infrastructure to support learning and teaching.
4. Pedagogical application of information and communication technology.
5. Professional/staff development for the effective use of technologies for learning and teaching.
6. Staff support for the use of technologies for learning and teaching.
7. Student training for the effective use of technologies for learning.
8. Student support for the use of technologies for learning.

Jung's Asian Learner-Centred QA Framework is proposed by Jung (2012) who investigated Asian learners' perceptions of quality in e-learning and other forms of distance education. It can be used to review, revise, and elaborate the QA frameworks of e-learning providers and quality assessors from Asian learners' perspective.

This QA Framework⁴⁰ is built on three domains: supportive, pedagogical, and environmental. The three domains are used to categorize and organize the ten QA dimensions.

1. Supportive domain refers to an assistive quality aspect that helps learners carry out distance learning effectively and efficiently, and includes three quality dimensions *Faculty Support*, *Student Support*, and *Information and Publicity*.
2. Pedagogical domain refers to a core quality aspect in DE that helps learners develop and adjust their knowledge, skills, and attitudes both independently and collaboratively, and includes four quality dimensions *Course Development*, *Teaching and Learning*, *Interactive Tasks*, and *Evaluation and Assessment*.
3. Environmental domain refers to a contextual quality aspect that creates distance teaching and learning environments where learners work productively and flexibly with high confidence in DE, and includes three quality dimensions *Infrastructure*, *Internal QA Mechanism*, and *Institutional Credibility*.

The ASEAN Cyber University QA Framework was developed by Jung and Latchem (2012) on the request of S. Korean government. It includes a QA Policy Framework at both national and

³⁹http://www.acode.edu.au/resources/ACODE_benchmarks.pdf

⁴⁰<http://www.irrodl.org/index.php/irrodl/article/view/1159/2128>

institutional levels, and QA criteria and performance indicators (PIs) at course and content levels. In total, 113 essential PIs and 53 advanced PIs across 20 QA criteria in five domains were proposed. Twenty QA criteria across five domains are:

1. Learning Contexts domain Vision, policy-making and planning; Management and administration; Technology provision and infrastructure; Collaborative relationships/ partnerships; The quality assurance system.
2. Learning Resources domain Learning objectives; Learning content; Learning materials; Online features; Human resources (staff).
3. Learning Processes domain Information / advice; Learner support; Teaching and learning; Interaction (student-content, teacher-student, student-student, etc.).
4. Evaluation and Assessment domain Learning assessment and feedback; Program / course evaluation; Ethics.
5. Learning Outcomes domain Outcomes in the learners; Outcomes in the learning provision; Outcomes in the institution / wider society.

Models from Europe

European Universities Quality in e-Learning (UNIQUE) is a project of the European Foundation for Quality in E-learning (EFQUEL)⁴¹, a membership organization which provides services for quality development in Europe's HEIs. UNIQUE aims to be an 'accelerator' for quality improvement and innovation in e-learning, provide sector-wide benchmarks and enhance the implementation speed of the Bologna reforms in the area of technology-enhanced learning.

UNIQUE⁴² evaluates 10 areas across three domains at the institutional level:

1. Learning Resources Resources for Learning; Students; Faculty (Teachers); Technology Equipment
2. Learning Processes Quality of the Office (e.g. catalogues and services, learning organization); Intellectual Property Rights (IPR) management; Personal development / Human Resource (HR) Development and Services
3. Learning Context/Institution Commitment to Innovation (culture, R&D); Institutional Standing (e.g. context and mission, background and experience, reputation in the e-learning community); Openness (e.g. access, connections with the corporate world, contribution to the community, international issues)

JISC's learning outcomes-based QA approach⁴³ was proposed by JISC⁴⁴, a non-profit organization

⁴¹<http://efquel.org/>

⁴²http://unique.europace.org/pdf/WP1-report-v5_FINAL.pdf

⁴³<http://www.jisc.ac.uk/media/documents/publications/effectivepracticedigitalage.pdf>

⁴⁴<http://www.jisc.ac.uk/>

which provides resources, knowledge, expertise and support regarding information and digital technology for education and research to UK educational institutions at a local, national and international level, has developed practical guidelines for designing effective e-learning.

JISC defines the quality of e-learning or effective practice in e-learning as using a range of pedagogic skills to bring about the best possible learning outcomes for specific groups of learners in order to meet their particular learning needs. In designing effective learning e-learning, it suggests that the following issues need to be considered:

1. Learners (e.g. their needs, motives for learning, prior experience of learning, social and interpersonal skills, learning preferences and ICT competence).
2. Intended learning outcomes (e.g. acquisition of knowledge, academic and social skills, increased motivation and ability to progress).
3. Learning environment (e.g. face-to-face or virtual; available resources, tools, learning content, facilities and services).
4. Curriculum aspects (e.g. approach(es) to learning, assessment criteria, formative assessment strategies; feedback).
5. Learning activity (description of activity; associated learning outcome; organization: collaborative, pairs or individual; resources needed).
6. Support for learning (e.g. extension or reinforcement activities; involvement of others; accessibility considerations; learning preferences).
7. Evaluation (outcomes for learners; achievement of learning objectives; feedback from others).

The “Open Educational Quality Initiative (OPAL)” is an international network to promote innovation and improved quality in education and training through the use of OER. It has been established through international organizations including UNESCO, International Council for Open and Distance Education (ICDE) and European Foundation for Quality in eLearning (EFQUEL), and some universities in Europe with part fund from the European Commission Education and Training Lifelong Learning Programme. The University of Duisburg-Essen, Germany is leading the OPAL initiative. It has developed the Guidelines for Open Educational Practices (OEP) in Organizations⁴⁵ and dimensions of good OEP⁴⁶ to support HEIs to analyze, implement and improve practices in creating and adopting OER. Seventeen dimensions for quality OER practice are proposed across three areas.

1. Area 1: Use of OER and Open Learning Architectures
Extent of using and repurposing OER;
Availability of a process for OER creation; Degree of sharing of OER and OEP; Extent

⁴⁵<http://www.oer-quality.org/wp-content/uploads/2011/03/OPAL-OEP-guidelines.pdf>

⁴⁶<http://www.oer-quality.org/wp-content/uploads/2011/03/OEP-const-elements.pdf>

of working with open learning architectures.

2. Area 2: Vision of Openness and a Strategy for OEP in an Organization
Organizational vision for OEP; Existing OEP strategies and policies; Business model related to OEP; Partnerships related to OE; Perceived relevance for OEP.
3. Area 3: Implementing and Promoting OEP to Transform Learning IPR and Copyright regulations; Motivational framework for OEP; OEP usage; Tools to support sharing and exchange of OEP; Quality concepts for OEP; Level of knowledge and skills; Digital literacy; Support mechanisms for OEP.

A QA Model for OCW and OER was proposed by Vladoiu (2011), a researcher from Romania. It includes a set of criteria for QA of OER and OCW (Vladoiu, & Constantinescu, 2012, pp. 204 – 209).

1. Content related criteria readability, uniformity of language, terminology, and notations; availability of the course syllabus, comprehensiveness of the lecture notes, modularity of the course content, possibility to select the most suitable learning unit, opportunity to choose the most appropriate learning path, top-down, bottom-up or combined approach, and availability of assignments (with or without solutions).
2. Instructional design related criteria resource's goal and learning objectives, appropriate instructional activities, learning outcomes, availability of the evaluation and auto-evaluation means (with or without solutions), learning theory, the instructional design model used for that particular educational resource, and reflective learning proneness.
3. Technology related criteria compliance with standards for interoperability and accessibility, extensibility, reliability, user interface's navigational regard to the at user's end (both hardware and software), along with the prerequisite skills to use that technology, multi-platform capability, supporting tools, and security of user confidential information.
4. Courseware evaluation criteria information about the content scope and sequence, the intended audience, the grade level, the periodicity of updating the content, the author's credentials and the source credibility, its availability in multiple languages, instructor facilitation or some kind of semi-automated support, suitability for self-study and/or classroom-based study and/or peer collaborative study, the time requirements, the grading policy, along with instructions about using the courseware and its components.

Models from North America

The Quality Matters Rubric for Higher Education⁴⁷, created by Quality Matters (QM)⁴⁸, is designed to certify the quality of online courses and online components in the USA. The Rubric has 8 general standards:

1. Course Overview and Introduction.
2. Learning Objectives (Competencies).
3. Assessment and Measurement.
4. Instructional Materials.
5. Learner Interaction and Engagement.
6. Course Technology.
7. Learner Support.
8. Accessibility.

Across these eight areas, 41 specific standards are used to evaluate the design of online and blended courses at higher education level. The Rubric is complete with annotations that explain the application of the standards and the relationship among them. A scoring system and set of online tools facilitate the evaluation of online and blended courses by a team of reviewers.

It is proposed that there should be a Quality Management Peer review process occurring at the course level both officially following QM policies and protocols and unofficially using internal or informal subscribers. Team majority decisions determine the points awarded to the 41 specific standards of the rubric which have a point value of 1, 2, or 3, totaling a possible 95 points. Two out of three reviewers have to agree that the standard is met or the total points awarded are zero. All courses require 81 points or 85% and must meet all essential standards.

The Best Practices for Electronically Offered Degree and Certificate Programs⁴⁹ was developed by the eight regional accrediting commissions in the USA in response to the emergence of e-learning as an important component of higher education. Institutions can evaluate the quality of their e-learning programs following the ten plus protocols per component, which are then divided into several questions to create a fine tuned evaluation instrument. The QA guidelines are divided into five components:

1. Institutional Context and Commitment.

⁴⁷<https://www.qualitymatters.org/rubric>

⁴⁸<https://www.qualitymatters.org/>

⁴⁹http://continuingstudies.wisc.edu/campus-info/toolkit/online_article1.pdf

2. Curriculum and Instruction.
3. Faculty Support.
4. Student Support.
5. Evaluation and Assessment.

The Open eQuality Learning Standards (OeQLs)⁵⁰ was developed by Barker (2007) from a perspective of consumer protection. Believing that QA must be: “objective (incorporating both provider and user views), professional (conducted by quality assessors), credible (when compared to standards of excellence), reputable (using processes and standards recognized by others), iterative (process-oriented), and continuous (ongoing and built in to the organization’s funding and planning strategies)” (Barker, 2007, p. 115), OeQLs proposes 21 QA criteria across three QA elements:

1. Outcomes and Outputs Element Skills and knowledge acquired; Learning skills acquired; Credits and credentials awarded; Return on investment.
2. Processes and Practices Management of students; Delivery and management of learning; Appropriately used technologies; Communications.
3. Inputs and Resources Intended learning outcomes; Curriculum content; Teaching/learning materials; Product/service information; Appropriate learning technologies; Sound technical design; Personnel; Learning resources; Complete learning package; Comprehensive course package; Routine review and evaluation; Program plans and budget; Advertising and admissions information.

Eight Rubrics for evaluating OER objects⁵¹ have been developed by Achieve⁵², an independent, nonpartisan, nonprofit education reform organization working with states in the USA, in partnership with OER Commons. These rubrics aim to help states, teachers and other OER users determine the quality of OER and the degree of alignment of OER to each state’s common core standards. Eight rubrics include:

1. Rubric I. Degree of Alignment to Standards which focuses on content and performance expectations.
2. Rubric II. Quality of Explanation of the Subject Matter which rates how thoroughly the subject matter is explained or otherwise revealed in the object.
3. Rubric III. Utility of Materials Designed to Support Teaching which focuses on the evaluation of the potential utility of an OER object at the intended grade level for the majority of

⁵⁰http://www.futured.com/documents/OeQLsMay2004_000.pdf

⁵¹<http://www.achieve.org/files/AchieveOERRubrics.pdf>

⁵²<http://www.achieve.org>

teachers.

4. Rubric IV. Quality of Assessment which applies to those OER objects designed to find out what a student knows before, during, or after a topic is taught.
5. Rubric V. Quality of Technological Interactivity which applies to OER objects designed with a technology-based interactive component.
6. Rubric VI. Quality of Instructional Tasks and Practice Exercises which applies to OER objects that contain exercises designed to provide an opportunity for practice and skill development.
7. Rubric VII. Opportunities for Deeper Learning which applies to objects designed to engage learners in deeper learning such as critical thinking, complex problem solving, collaborative learning, and so on.
8. Rubric VIII. Assurance of Accessibility which assures accessibility of materials to all students, including students with disabilities.

Development of Quality Standards for e-ASEM OER

Procedure

The study followed three steps.

1. Initial development: First, the initial development of the QA Standards for e-ASEM OER was suggested based on aforementioned QA standards and research in ODL/e-learning and revised after the external consultation with three experts with extensive experience in OER projects in the context of ODL. During this process, the original 52 QA standards were refined and reduced to the 48 QA standards across eleven areas under three domains (see Appendix A: Section 2).
2. Verification: It was then verified with instructors and researchers in ODL universities in Asia and Europe via an online survey. The online survey was first developed in English, pilot tested with ten researchers or instructors working in ODL institutions in Asia and Europe, and elaborated further to make each statement of the standards clearer. Once the online survey was finalized, it was submitted for the Review of Research Ethics to KNOU and got an approval in July 3, 2013.

The English version survey was distributed to nine ODL institutions across seven countries between July 4 and 31, 2013. For Chinese participants, it was translated in Chinese by a faculty member at Open University China (OUC). And for Thai participants, it was translated in Thai language by a faculty member of Thailand Cyber University (TCU).

3. Refinement: Based on the survey results, the QA standards were refined and re-categorized for ODL institutions in the ASEM context.

Instrument

An online survey was conducted to gather empirical evidence about a set of 48 items in the ten dimensions of QA in OER in the context of ODL in Asia and Europe. The purpose of the survey was to determine the level of importance (0 for none/very low in importance, 1 for low level of importance, 2 for moderate level of importance, 3 for high level of importance, and 4 for very high level of importance) of the items across ten dimensions so as to identify quality criteria as perceived by various stakeholders in OER adoption. In order to develop valid and reliable survey items, an initial list of eleven QA areas was developed based on related studies and OER/QA practices. Eleven QA areas include: 1) *Infrastructure*, 2) *Quality Assurance*, 3) *Institutional Vision & Support*, 4) *Finance & Partnership*, 5) *OER Development*, 6) *Learning Content*, 7) *Learning Support*, 8) *Online Features*, 9) *Learning Outcomes*, 10) *Return on Investment*, and 11) *Research & Development*. Once these eleven QA areas were identified and finalized, detailed standards of each area were created to gain information about various stakeholders' perceptions of OER quality. The initial list, which included 52 QA standards across eleven QA areas, was then reviewed by three ODL experts regarding the relevancy and validity of the items for measuring OER quality in the context of ODL. As a result of this consultation process, four items were deleted from the initial 52 because of irrelevancy or redundancy, and three items were revised for clarity. In total, 48 QA standards were included in the final online survey.

Participants

The survey was distributed to ODL nine ODL institutions across seven countries in Asia and Europe (see **Table 1**). In total, 181 responses were collected.

Country	Institution	N	%
China	Open University of China	63	34.8
Japan	Open University Japan; Kumamoto University Online Graduate School	18	9.9
Korea	Korea National Open University	23	12.7
Malaysia	Wawasan Open University, Open University of Malaysia	7	3.9
Netherlands	Netherland Open University	42	23.2
Spain	Open University of Catalonia	25	13.8
Thailand	Thailand Cyber University	3	1.7
Total		181	100.0

Table 1 Distribution of Respondents (N=181)

As shown in **Table 1**, around 35% of the participants were from China and around 23% from Netherlands. While these numbers indicate high level of OER adoption in China and Netherlands,

they could have affected the results of the survey. Thus caution is needed to interpret the data due to the substantial differences in country distribution.

Table 2 shows demographic features of the participants. Slightly over 51% of the participants were male students and around 40% were between the ages of 30 – 39. Around 28% of the participants were instructors/academic staff while less than 2% policy makers. Almost 34% had 3 – 5 years of experience with OER and over 40% claimed that they had moderate or high level of expertise in OER development.

Characteristics	n	%	Characteristics	n	%
<u>Gender</u>			<u>Age</u>		
Female	88	48.6	20 – 29	29	16.0
Male	93	51.4	30 – 39	71	39.2
			40 – 49	50	27.6
			50 – 59	27	14.9
			Above 60	4	2.2
<u>OER experience</u>			<u>Major role</u>		
None	34	18.8	Learner	44	24.3
1 – 2 years	54	29.8	Instructor or Academic staff	51	28.2
3 – 5 years	61	33.7	Instructional Designer	17	9.4
6 – 9 years	19	10.4	Support Staff	34	18.8
10 years or more	13	7.2	Policy Maker	3	1.7
Total	181	100.0	Researcher	32	17.7
			Total	181	100.0
<u>Level of OER development</u>					
Beginner/Novice	41	22.7			
Low	39	21.5			
Moderate	58	32.0			
High	33	18.2			
Very High	10	5.5			
Total	181	100.0			

Table 2 Demographic Characteristics of Respondents(N=181)

Result

Importance of QA standards

It appeared that most items were perceived as important for assuring the quality of OER in the context of ODL with ratings of over 3 out of 4. The standards related to QA of OER's learning content (QA 6) considered to be highly important while two standards (QA 10 – 1 and QA 10 – 2) related to return on investment appeared less important compared with other standards.

Table 3 presents the number of response in assessing the importance of each of the 48 QA standards.

QA standards	None/ Very Low	Low	Moderate	High	Very High	Average Rating
QA area 1) Infrastructure (N=143)						
QA 1) 1. The institution provides appropriate and reliable media/technology infrastructure to develop, deliver and manage OER.	4	10	47	61	21	3.59
QA 1) 2. The institution periodically evaluates the quality and uses of media/technology infrastructure.	4	17	49	54	19	3.39
QA 1) 3. The institution uses media/technologies effectively and efficiently in the provision of OER.	2	19	55	55	12	3.47
QA area 2) Quality Assurance (N=156)						
QA 2) 1. The institution has clear internal QA policies and systems for its OER initiatives.	4	21	44	60	14	3.41
QA 2) 2. The institution periodically seeks learners'/stakeholders' views on the quality of its OER.	7	26	63	30	17	3.17
QA 2) 3. The institution regularly conducts internal and external QA for the purposes of continuous improvement and public accountability in its use of OER.	7	29	44	51	12	3.22
QA 2) 4. The institution encourages and supports a quality culture in its OER operations.	5	24	35	66	13	3.41
QA area 3) Institutional Vision & Support (N=156)						
QA 3) 1. OER provisions are aligned with the institution's vision, mission and goals.	3	13	48	57	22	3.57
QA 3) 2. The institution establishes the organizational structure appropriate for operations needed for quality OERs.	4	22	41	58	18	3.44

QA 3) 3. The institution demonstrates strong leadership in initiating and supporting educationally sound and ethical operations of OER.	3	23	54	42	21	3.38
QA 3) 4. The institution encourages and rewards its faculty and staff in regard to OER development and use.	9	22	46	51	15	3.29
QA 3) 5. The institution develops faculty and staff's competencies in OER operations.	6	29	46	48	14	3.24
QA area 4) Finance & Partnership(N=143)						
QA 4) 1. The institution makes a continuous effort to secure and allocate adequate financial resources for OER operations.	7	22	55	45	14	3.26
QA 4) 2. The institution carefully monitors the costs, cost savings, cost-effectiveness and cost-efficiency of its OER operations.	7	27	58	37	14	3.17
QA 4) 3. The institution operates collaboration and networking among the departments, units, local study centers, etc., involved in OER operations.	5	24	49	55	10	3.29
QA 4) 4. The institution engages in collaborative development and resource sharing with other OER providers, in-country and/or internationally.	9	23	54	44	13	3.20
QA area 5) OER Development (N=143)						
QA 5) 1. The institution ensures that OER are developed in ways appropriate to the learners' computer systems, network speeds, etc. (N=129)	3	14	56	43	13	3.38

2nd Regional Symposium on OER

QA 5) 2. The institution develops forms of OER (e.g., modules, learning objects, videos, audios, tests, software, full courses, course materials, etc) appropriate to the learners' needs and circumstances.	1	10	23	26	14	3.57
QA 5) 3. The institution achieves the best possible use of the available courses and courseware by designing, adopting or adapting OER.	2	17	49	46	15	3.43
QA 5) 4. The institution develops OER in accord with sound principles of instructional design.	3	21	33	56	16	3.47
QA 5) 5. The institution ensures that OER accord with copyright laws (Commons License) and are correctly cited / acknowledged.	2	11	38	55	23	3.67
QA area 6) Learning Contents (N=129)						
QA 6) 1. The OER content is well-matched to the learners' needs and the learning objectives.	1	12	36	53	27	3.72
QA 6) 2. The content is accurate.	0	7	36	65	21	3.78
QA 6) 3. The content is regularly updated.	3	17	37	52	20	3.53
QA 6) 4. The content is logically presented in order of difficulty.	4	14	52	46	13	3.39
QA 6) 5. The content is presented in ways appropriate to the learners' knowledge, skills and abilities.	2	12	41	61	13	3.55
QA 6) 6. The amount of content to be studied and acted upon is appropriate to the duration of the studyaccountability of its OERs.	3	12	46	55	13	3.49
QA 6) 7. The OER are culturally appropriate and contain no racial or gender bias.	1	9	44	54	21	3.66
QA 6) 8. The content is developed through rigorous academic processes by well-qualified persons.	3	9	40	55	22	3.65
QA area 7) Learning Support (N=143)						
QA 7) 1. The learners are helped to find their way through the repository and where other OER appropriate to the student may be found on other websites.	3	17	44	50	15	3.44

QA 7) 2. The learners are provided with clear information on how to use the OER and create 'personal learning environments' by remixing, manipulating, aggregating and sharing content according to their particular needs and interests.	3	22	40	55	9	3.35
QA 7) 3. The OER include text, audio or video orientation and introductory components to familiarize the learners with the courses and their instructors/support personnel.	1	14	48	51	15	3.50
QA 7) 4. The OER include examples, formative self-assessment activities and other means of support to enable the learners to study independently/ at a distance.	1	16	45	52	15	3.50
QA 7) 5. The learners are provided with asynchronous/ synchronous online support, or face-to-face/hybrid support.	3	21	38	53	14	3.42
QA 7) 6. The institution provides detailed information on OERs to prospective users. (n=55)	1	6	22	22	4	3.40
QA area 8) Online Features(N=129)						
QA 8) 1. The screen layout of OER is suited to the learners' experience, knowledge and abilities.	2	13	61	45	8	3.34
QA 8) 2. The screen layout of OER helps the learners comprehend the content and avoids distracting features.	2	13	53	50	11	3.43
QA 8) 3. The user-interface components (buttons, menus, icons, scroll bars, etc.) are arranged consistently to help the learners navigate the site easily.	1	11	49	57	11	3.51
QA 8) 4. The site facilitates flexible learning by allowing learners to control the rate, order and process of their learning.	2	18	43	55	11	3.43
QA 8) 5. Navigation guidance systems (e.g., breadcrumb trail and site map) are integrated in OER site to enable learners to know where they are relative to the rest of the site.	1	18	50	53	7	3.36

QA 8) 6. The effectiveness and efficiency of the online features of the OER site is subject to ongoing evaluation.	2	23	45	47	12	3.34
QA area 9) Learning Outcomes (N=126)						
QA 9) 1. The learning objectives for each OER course or module reflect the needs of the learners and society.	5	10	50	47	14	3.44
QA 9) 2. The assessment mechanisms of the OER measure the accomplishment of these learning objectives.	4	16	46	48	12	3.38
QA area 10) Return on Investment (N=126)						
QA 10) 1. The institution monitors return-on-investment (ROI) in OER from both monetary and non-monetary perspectives.	7	32	50	32	5	2.96
QA 10) 2. The institution evaluates the contribution of OER-based provision to society and local communities.	6	29	55	32	4	2.99
QA 10) 3. The institution utilizes the success or failure data from the ROI studies to improve its OER products and services.	9	27	46	35	9	3.06
QA area 11) Research & Development (N=126)						
QA 11) 1. The institution promotes and supports research in OER by its faculty/staff.	5	17	44	47	13	3.36
QA 11) 2. The institution applies these research findings in improving its OER.	6	17	48	43	12	3.30
QA 11) 3. The institution collaborates with various international, national, governmental and non-governmental agencies in undertaking and sharing research in OER.	7	20	36	47	16	3.36

Table 3 Number of Responses to Importance of QA Standards and Average Rating

Regional differences in importance of QA areas

Regional differences in the perceptions of the selected 4 QA areas and QA standard variables were statistically tested. As shown in Table 4, no significant differences were found in the perception of key five QA areas (QA 2, QA 3, QA 11, QA 1, and QA 4). However, there were significant differences in the perceptions of the importance of the following seven QA standards between Asian and European participants. That is, Asian respondents perceived these QA standards more important in assessing the quality of OER than European respondents did:

- QA 5 1. The institution ensures that OER are developed in ways appropriate to the learners' computer systems, network speeds;
- QA 6 2. The content is accurate;
- QA 6 4. The content is logically presented in order of difficulty;
- QA 6 5. The content is presented in ways appropriate to the learners' knowledge, skills and abilities;
- QA 6 7. The OER are culturally appropriate and contain no racial or gender bias;
- QA 10 1. The institution monitors return-on-investment in OER from both monetary and non-monetary perspectives; and
- QA 10 2. The institution evaluates the contribution of OER-based provision to society and local communities.

QA Variable	1:Asia 2:Europe	n	Mean	SD	SE	P-value
QA 2 Quality Assurance	1	89	3.2528	.86807	.09202	.36
	2	40	3.4063	.86914	.13742	
QA 3 VisionSupport	1	89	3.4472	.82021	.08694	.57
	2	40	3.3550	.89039	.14078	
QA 11 Research&Development	1	88	3.3220	.87894	.09370	.71
	2	38	3.3860	.94448	.15322	
QA 1 Infrastructure	1	89	3.4719	.77981	.08266	.48
	2	40	3.5750	.69997	.11067	
QA 4 Finance &Partnership	1	89	2.1966	.53922	.05716	.24
	2	40	2.0667	.65350	.10333	

QA 5 – 1	1	89	3.5618	.99949	.10595	.03
	2	40	3.9000	.67178	.10622	
QA 6 – 2	1	88	3.3295	.97935	.10440	.02
	2	38	3.4474	.97807	.15866	
QA 6 – 4	1	89	3.3371	.97635	.10349	.04
	2	40	3.1750	1.15220	.18218	
QA 6 – 5	1	89	3.2472	.95680	.10142	.002
	2	40	2.9750	1.09749	.17353	
QA 6 – 7	1	89	3.6629	.79692	.08447	.02
	2	40	4.0250	.69752	.11029	
QA 10 – 1	1	89	3.4607	.87978	.09326	.006
	2	40	3.3500	1.00128	.15832	
QA 10 – 2	1	89	3.6629	.79692	.08447	.02
	2	40	4.0250	.69752	.11029	

Table 4 Regional Differences in Perception of QA Areas and QA Standards

Significant QA areas in explaining the quality of OER

To identify significant QA areas in assessing the quality of OER, the regression analysis was conducted with *Quality Assurance* as a dependent variable. As seen in **Tables 5** and **6**, the results of testing four different regression models reveal that the final 4th model with the four key QA areas was most well fitted in explaining the quality of OER. These key QA areas are:

- QA 3. Institutional Vision & Support;
- QA 11. Research & Development;
- QA 1. Infrastructure; and
- QA 4. Finance & Partnership.

The four QA areas could explain 73.2% of QA in OER. When we fitted the regression model with a single variable, *Institutional Vision & Support* appeared to be the strongest variable in predicting QA, with 61.8% coefficient of determination R^2 while *Research & Development* with 53% of the R^2 , *Infrastructure* with 46% of the R^2 , and Finance & Partnership with 61.6% of the R^2 (see **Tables 5**).

Coefficient^a

	Non standardized		Standardized	t	P-value
	B	SE	β		
Constant	-.086	.203		-.424	.672
QA1_3 Vision & Support	.299	.055	.221	3.765	.000
QA3_11 Research & Development	.234	.049	.261	4.636	.000
QA1_1 Infrastructure	.227	.049	.284	4.858	.000
QA1_4 Finance & Partnership	.364	.130	.319	5.190	.000
R ²	0.769				

Table 5 Regression Analysis for Important QA Areas in Predicting QA in OER ^a. Dependent Variable: QA

Notes: $Y(\text{QA of OER}) = -0.086 + 0.299 \text{ QA13} + 0.234 \text{ QA311} + 0.227 \text{ QA11} + 0.364 \text{ QA14}$ (QA13: Institutional Vision & Support, QA11: Infrastructure, QA311: Research & Development; and QA14: Finance & Partnership)

Significant QA standards in explaining the quality of OER

To examine important QA standards in assessing the quality of OER, the regression analyses were conducted with *Quality Assurance* as a dependent variable and QA standards as independent variables. It was found that the regression model with the following six standards explained 76.9% coefficient of determination (see **Table 6**):

- QA 3 1. The OER provisions are aligned with the institution's vision, mission and goals;
- QA 11 1. The institution promotes and supports research in OER by its faculty/staff;
- QA 3 5. The institution develops faculty and staff's competencies in OER operations;
- QA 4 2. The institution carefully monitors the costs, cost savings, cost-effectiveness and cost-efficiency of its OER operations; and
- QA 6 2. The content is accurate.

- QA 5 3. The institution achieves the best possible use of the available courses and courseware by designing adopting or adapting OER.

$$Y(\text{QA of OER}) = -0.197 + 0.206 \text{ QA3_1} + 0.229 \text{ QA11_1} + 0.239 \text{ QA3_5} + 0.271 \text{ QA4_2} + 0.207 \text{ QA5_3} - 0.130 \text{ QA6_2}$$

Coefficient^a

	Non standardized		Standardize d	t	P-value
	B	SE	β		
Constant	-.197	.211		-.935	.352
QA3_1	.206	.055	.221	3.765	.000
QA11_1	.229	.049	.261	4.636	.000
QA3_5	.239	.049	.284	4.858	.000
QA4_2	.271	.052	.319	5.190	.000
QA5_3	.207	.058	.186	3.545	.001
QA6_2	-.130	.057	-.138	-2.272	.025
R ²	0.769				

Table 6 Regression Model Summary of QA Standards in Predicting QA in OER ^a. Dependent Variable: QA

Suggestions and Recommendations

Based on the analyses of OER QA studies and practices, and the survey results, this section offers major suggestions for ODL institutions and educators to develop contextualized or localized QA standards for e-ASEM OER. It concludes with a set of recommendations for future development of OER and QA framework.

Suggestions for the Development of QA Standards for e-ASEM OER

ODL institutions planning to develop and implement high quality OER are strongly recommended to adopt a set of QA standards to safeguard the quality of OER. In developing a contextualized set of QA standards for OER, ODL institutions can refer to various QA standards reviewed in the earlier section of this report and adapt them to reflect their unique ODL features, considering the following suggestions.

- A set of QA standards should be developed across such QA areas as *Infrastructure*, *Quality Assurance*, *Institutional Vision & Support*, *Finance & Partnership*, *OER Development*, *Learning Content*, *Learning Support*, *Online Features*, *Learning Outcomes*, *Return on Investment*, and *Research & Development*.
- Among these areas, *Institutional Vision & Support*, *Research & Development*, *Infrastructure*, and *Finance & Partnership* are particularly important for a sustainable QA framework (see **Figure 1**).

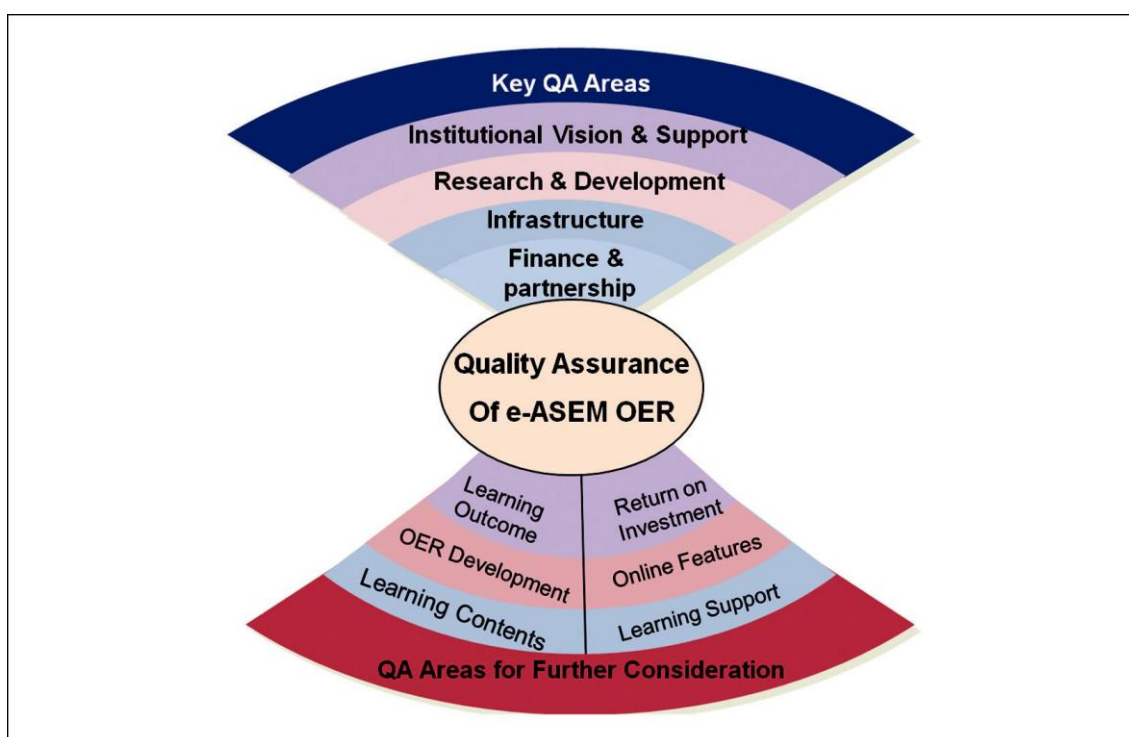


Figure 1 QA areas to be included in the QA framework for e-ASEM OER

- More detailed QA standards should be developed under each of these QA areas. While most of the QA standards suggested in **Table 3** can be used, we suggest ODL institutions and educators to pay particular attention to the following seven QA standards and include these in the QA framework.
 - 1) The institution provides appropriate and reliable media/technology infrastructure to develop, deliver and manage OER (Under the area of *Infrastructure*)
 - 2) The OER provisions are aligned with the institution's vision, mission and goals (under the QA area of *Institutional Vision & Support*).
 - 3) The institution develops faculty and staff's competencies in OER operations (under the QA area of *Institutional Vision & Support*).

- 4) The institution carefully monitors the costs, cost savings, cost-effectiveness and cost-efficiency of its OER operations (under the QA area of *Finance & Partnership*).
 - 5) The institution promotes and supports research in OER by its faculty/staff (under the QA area of *Research & Development*).
 - 6) The content of OER is accurate and regularly updated (under the QA area of *Learning Content*).
 - 7) The institution achieves the best possible use of the available courses and courseware by designing adopting or adapting OER (under the QA area of *OER Development*).
- For Asian ODL institutions and educators, we recommend to give a high priority to the following seven QA standards as they are perceived as more important than other standards by Asian educators and learners.

- 1) The institution ensures that OER are developed in ways appropriate to the learners' computer systems, and network speeds (Under the area of *Infrastructure*).

Compared with European countries, many Asian countries have lack of appropriate technology infrastructure for ODL/e-learning. As Selim (2007) reported, ODL learners with poor technology infrastructure and less experience with technology perceive problems with technology and access as serious barriers to their learning. Careful consideration about the learners' technology environment is needed for successful OER implementation.

- 2) The content is accurate (Under the area of *Learning Content*).
- 3) The content is logically presented in order of difficulty (Under the area of *Learning Content*).
- 4) The content is presented in ways appropriate to the learners' knowledge, skills and abilities (Under the area of *Learning Content*).
- 5) The OER are culturally appropriate and contain no racial or gender bias (Under the area of *Learning Content*).

Jung (2012) found that Asian distance learners perceived *Course Development* component as the most important dimension in assessing the quality of ODL. She further revealed that Asian learners perceive a ODL course that offers well-structured materials that follow clear development procedures and are considerate of learners' needs to be of high quality. The above listed four QA standards under the category of *Learning Content* also show

that Asian OER users view *Learning Content* of OER that is accurate, logically structured, developed based on learning needs, and culturally appropriate as more important in assuring the quality of OER, compared with their counterparts in Europe. This difference needs to be considered when developing and implementing OER in Asia.

- 6) The institution monitors return-on-investment in OER from both monetary and non-monetary perspectives(Under the area of *Return on Investment*).
- 7) The institution evaluates the contribution of OER-based provision to society and local communities(Under the area of *Return on Investment*).

Compared with Europe, ODL has been growing fast in Asian higher education. ODL is reaching out to more adult learners, new forms of delivery such as e-learning and m-learning are being rapidly adopted even in the least developed parts of the region, new providers are entering the market and there is a surge in ODL export and import. The most distinctive feature of Asian ODL is huge student population in ODL institutions and over 5 million potential students.Considering the huge number of present and future student enrollment in ODL institutions, the quality of Asian ODL has become more important than ever for the development of higher education and Asian society as a whole. That's why Asian respondents of our study gave more attention to both monetary and non-monetary benefits of OER and social contribution of OER. Asian ODL institutions are expected to consider various benefits of OER and community/social roles of OER when they invest in OER development.

Recommendations for Future Development of OER and QA Framework

The level of OER development and implementation in higher education in Asia and Europe varies across the countries and ODL institutions. So does the QA policy integration in an overall institutional QA framework. This study showed that QA models and criteria developed for ODL could be adopted and adapted for the development of QA standards for OER, and offered a set of suggestions that could be considered when preparing QA standards for e-ASEM OER. The following recommendations are offered for further development of OER in the context of ODL.

- Overall, QA in OER is at a quite early stage of development. The different QA approaches discussed above reflect the differences in cultures, expectations, and purposes. Each of these approaches has its own particular strengths and weaknesses, so it would be undesirable to recommend any single approach. However, in light of our survey finding, it is suggested that ODL institutions develop a set of QA standards around 11 areas: 1) *Infrastructure*, 2) *Quality Assurance*, 3) *Institutional Vision & Support*, 4) *Finance & Partnership*, 5) *OER Development*, 6) *Learning Content*, 7) *Learning Support*, 8) *Online Features*, 9) *Learning Outcomes*, 10) *Return on Investment*, and 11) *Research & Development*, with special focus on *Infrastructure*, *Institutional Vision & Support*, *Finance & Partnership*, and *Research & Development*.

- There is need to develop a quality culture within ODL institutions. As Sir John Daniel (2013) argued, OER is an important development for all forms of education including ODL. Thus, all ODL institutions should see that QA in OER is also an integral part of their ODL's QA framework. To offer OER users high-quality learning resources, QA policies in OER should be linked to the broader institutional QA system. QA in OER should be seen as a system for self-improvement and public accountability of ODL institutions.
- ODL institutions should begin to develop specific QA guidelines, criteria, and methods for the various types of OER. In addition, detailed key performance indicators for each of the QA criteria would help ODL institutions monitor their performance in OER development and use against institutional objectives and vision. ODL institutions can use these indicators in self-assessment for continuous qualitative improvement of OER. The existence of a QA framework for OER would enable ODL institutions to make QA an integral part of their institutional missions with respect to teaching and research and to promote a quality culture in their institutions.
- Concerted efforts are needed from leaders, top managers, educators, administrative staff and learners of an ODL institutions regarding the development of high quality needs-based OER and diffusion of OER. ODL institutions should support all stakeholders to understand OER's benefits and challenges, and encourage them to take a part in OER development and implementation processes.
- Collaboration and partnership is necessary to develop high quality OER with less costs. As seen in the case of OERu, a consortium of ODL institutions, other organizations, and/or private sectors from different locations will help ODL institutions offer their best courses and programs while keeping the cost down, and also help students study independently or collaboratively through a variety of OER. As Daniel (2 – 13) posited, it is a new way of putting courses or programs together.

References

- Abeywardena, I.S., Dhanarajan G., & Chan C. S. (2012). Searching and locating OER: Barriers to the wider adoption of OER for teaching in Asia. *Proceedings of the Regional Symposium on Open Educational Resources: An Asian perspective on policy and practices* (pp. 1 – 11). Retrieved from https://oerknowledgecloud.org/sites/oerknowledgecloud.org/files/OERAsia_Symposium_Penang_2012_Proceedings-17.pdf
- Barker, K. C. (2007). E-learning quality standards for consumer protection and consumer confidence: A Canadian case study in e-learning quality assurance. *Educational Technology & Society*, 10(2), 109 – 119. Retrieved from http://www.ifets.info/journals/10_2/10.pdf
- Bossu, C., Brown, M., & Bull, D. (2012). Do open educational resources represent additional challenges or advantages to the current climate of change in the Australian Higher Education sector? *ascilite 2012*, 1 – 9. Retrieved from http://www.ascilite.org.au/conferences/wellington12/2012/images/custom/bossu,_carina_-_do_open.pdf

Bossu, C., & Tynan, B. (2011). OERs: new media on the learning landscape. *On the Horizon*, 19(4), 259 – 267.

Butcher, N. (2011). *A basic guide to open educational resources (OER)*. Vancouver and Paris: COL and UNESCO. Retrieved from <http://www.col.org/oerbasicguide>

Caswell, T., Henson, S., Jensen, M., & Wiley, D. (2008). Open educational resources: Enabling universal education. *International Review of Research in Open and Distance Learning*, 9(1), 1 – 4. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/469/1001>

Daniel, J. (2013, February). *Education across space and time*. Keynote speech at the Open and Distance Learning Association of Australia 2013 Summit, Sydney, Australia. Retrieved from <http://sirjohn.ca/wordpress/wp-content/uploads/2012/08/130204ODLAATX.pdf>

Dhanarajan, G., & Abeywardena I. S. (2013). *Higher education and open educational resources in Asia: An overview*. Vancouver: Commonwealth of Learning. Retrieved from http://www.col.org/PublicationDocuments/pub_PS_OER_Asia_web.pdf

Dichev, C., & Dicheva, D. (2012). Open educational resources in computer science teaching. *SIGCSE'11*, February 29 – March 3, 2012, Raleigh, NC, USA.

Downes, S. (2011). *Open educational resources: A definition*. Retrieved from http://www.downes.ca/archive/11/07_18_news_OLDaily.htm

Ehlers, U. (2011). *Beyond OER: Shifting focus to open educational practice. Open educational quality initiative*. Retrieved from http://duepublico.uni-duisburg-essen.de/servlets/DerivateServlet/Derivate-25907/OPALReport2011_Beyond_OER.pdf

Fukuhara, Y. (2008). *Current status of OCW in Japan*. Retrieved from <http://www.waseda.jp/DLI2008/program/proceedings/pdf/session8-4.pdf>

Hoosen, S. (2012). *Survey on governments' open educational resources (OER) policies*. Vancouver: Commonwealth of Learning.

Hylén, J. (2005). *Open educational resources: Opportunities and challenges*. Paris: Organization for Economic Co-operation and Development (OECD). Retrieved from <http://www.oecd.org/edu/ceri/37351085.pdf>

Inamorato, A., Cobo, C., & Costa, C. (Eds.) (2012). *Open Educational Resources: Cases from Latin America and Europe in higher education*. Rio do Janeiro: Universidade Federal Fluminense Publishing. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2193109

Jung, I. (2012). Asian learners' perception of quality in distance education and gender differences. *The International Review of Research In Open And Distance Learning*, 13(2), 1 – 25. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/1159/2128>

Jung, I.S., & Latchem, C. (2012). *A study into the development of the ASEAN Cyber University quality assurance manual*. Seoul. Seoul Cyber University.

Kanwar, A., Kodhandaraman, B., & Umar, A. (2010). Toward sustainable open education resources: A perspective from the global South. *American Journal of Distance Education*, 24(2), 65 – 80.

Kernohan, D. (2012). OER and quality assurance. London: JISC. Retrieved from <http://msuglobal.com/wp-content/uploads/OER-and-Quality-Assurance-AgShare2-dk.pdf>

Law, P., Perryman, L., & Law, A. (2013). Open educational resources for all? Comparing user motivations and characteristics across The Open University's iTunes U channel and Open-Learn platform. *Proceedings of Open and Flexible Higher Education Conference* (pp. 204 – 219). Paris, European Association of Distance Teaching Universities (EADTU). Retrieved from <http://oro.open.ac.uk/39102/1/eadtu%2520annual%2520conference%25202013%2520-%2520proceedings.pdf>

Li, Y., & Li, X (2013). A Study on the use of Open Educational Resources in China. In G. Dhanarajan, & D. Porter (Eds.), *Perspectives on open and distance learning: Open educational resources: An Asian perspective* (pp. 21 – 40). Vancouver: Commonwealth of Learning.

McAndrew, P. (2006). *Motivations for OpenLearn: The Open University's Open Content initiative*. Paris: OECD. Retrieved from <http://kn.open.ac.uk/public/getfile.cfm?documentfileid=10026>

McGreal, R. (2013). *Creating, using and sharing open educational resources*. Vancouver: Commonwealth of Learning. Retrieved from http://www.col.org/PublicationDocuments/KS13_OER.pdf

Mikroyannidis, A., & Connolly, T. (2012). Introducing personal learning environments to informal learners: Lessons learned from the OpenLearn case study. *PLE Conference 2012*, 11 – 13 July 2012, Aveiro, Portugal. Retrieved from <http://oro.open.ac.uk/34501/1/OpenLearn-PLEConf-final.pdf>

OCW EU Project Team (2012). *OpenCourseWare in the European higher education context: How to make use of its full potential for virtual mobility*. Progress report. Retrieved from http://eacea.ec.europa.eu/lp/project_reports/documents/erasmus/multilateral_actions_2011/esmo/eras_esmo_518373.pdf

OER Foundation (2011). FAQs: Information about OER. Retrieved from http://wikieducator.org/WikiEducator:OER_Foundation/FAQs/Open_Education_Resources/

Olcott, D. (2012). OER perspectives: Emerging issues for universities. *Distance Education*, 33(2), 283 – 290.

OPAL (2011). *Beyond OER: Shifting focus to open educational practices*. Essen, Germany: Open Education Quality Initiative.

Open.Michigan (2013). *Open educational resources: Benefits for faculty and students*. Retrieved from <http://open.umich.edu/sites/default/files/3659/PDFs/OER-benefits-handout.pdf>

Panke, S. (2011). An expert survey on the barriers and enablers of open educational practices. *eLearning Papers*, 23. Retrieved from <http://openeducationeuropa.eu/en/article/An-Expert-Survey-on-the-Barriers-and-Enablers-of-Open-Educational-Practices>

Park, I.W. (2010). *Study on the integration of open educational resources (OER) into regular higher education system*. Seoul: Korea Education Research Information Service.

Perryman, L., Law, P., & Law, A. (2013). Developing sustainable business models for institutions' provision of open educational resources: Learning from OpenLearn users' motivations and experiences. *Proceedings of Open and Flexible Higher Education Conference* (pp. 270 – 286). Paris, European Association of Distance Teaching Universities (EADTU). Retrieved from <http://oro.open.ac.uk/39101/1/eadtu%20annual%20conference%202013%20-%20proceedings.pdf>

Punie Y., & Haché, A. (2012). *IPTS study on Open Educational Resources in Europe (OEREU)*. [PowerPoint slides]. Retrieved from http://is.jrc.ec.europa.eu/pages/EAP/documents/OEREU_projectoutlineEACTWG120522_000.pdf

Selim, H.M. (2007). Critical success factors for e-learning acceptance: Confirmatory factor models. *Computers & Education*, 49(2), 396 – 413.

Vladoiu, M. (2011). *Towards a quality model for Open CourseWare and Open Educational Resources*. Retrieved from <http://www.unde.ro/monica/papers/04-KMEL%202012-springerLNCS.pdf>

Vladoiu, M., & Constantinescu, Z. (2012). Evaluation and comparison of three Open Courseware based on quality criteria. *Current Trends in Web Engineering Lecture Notes in Computer Science*, 7703, 204-215. Retrieved from <http://www.unde.ro/zoran/papers/QWE-2012.pdf>

Wiley, D. (Ed.) (2008). *OER handbook for educators*. Beaumont: Center for Open and Sustainable Learning. Retrieved from http://wikieducator.org/OER_Handbook/educator_version_one

Willems, J., & Bossu, C. (2012). Equity considerations for open educational resources in the glocalization of education. *Distance Education*, 33(2), 185 – 199.

Wilson, T. (2007). *Open educational resources environment: Exploring the potential benefits of OpenLearn for seniors*. Retrieved from http://oro.open.ac.uk/29822/1/Tina_Wilson-Open_Educational_Resource_environment_EN.pdf

Yamada, T. (2013). Open educational resources in Japan. In G. Dhanarajan, & D. Porter (Eds.), *Perspectives on open and distance Learning: Open educational resources: An Asian perspective* (pp. 87 – 108). Vancouver: Commonwealth of Learning.

Yergler, N.R. (2010). Search and discovery: OER's open loop. In *Open Ed 2010 Proceedings*: Barcelona: UOU. Retrieved from <http://openaccess.uoc.edu/webapps/o2/bitstream/10609/4852/6/Yergler.pdf> Yuan, L., MacNeill S., & Kraan, W. (2008). *Open educational resources: Opportunities and challenges for higher education*. JISC CETIS. Retrieved from http://wiki.cetis.ac.uk/images/0/0b/OER_Briefing_Paper.pdf