



Quality Assurance Guidelines for

Open Educational Resources:

TIPS Framework

Version 1.0

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Commonwealth Educational Media Centre for Asia
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Executive Summary

Open Educational Resources (OER) are currently seen as a viable way forward for achieving education for all. In particular developing countries can benefit through OER from developed regions. Indeed OER are now popular in Western countries and are being pro-actively created by specialist educators and institutions. These mostly involve tertiary formal education almost to the exclusion of pre-tertiary (particularly out-of-school), non-formal, vocational, and lifelong learning. Accordingly these guidelines set out to increase the author-base by offering ideas to teachers in primary and secondary schools - so that when they look at creating their own OER they have recourse to these guidelines to help them. Not all the criteria listed here are relevant to each OER or to each author, and no prescriptive purpose is intended.

The aim is to offer a starting point for building a culture of quality and professional reflection among teachers who are interested in creating their own OER. The intended audience includes also their students who may want to learn through creating OER. It is hoped that through these guidelines that teachers in developing regions produce their own OER and contribute to this movement for the benefit of themselves and others who reuse their work. Accordingly we define OER here as being digital educational resources with an attached open licence allowing others to reuse, adapt and share their work. This report explores the original definition of OER and subsequent versions, and puts forward a current definition drawing from received feedback, research and practice. The report here including the framework of criteria is offered as a work-in-progress, and hopes to stimulate feedback from users of the guidelines so as to improve them.

More than thirty frameworks giving criteria for quality assurance in related fields such as e-learning or educational innovations have been reviewed. Criteria have been harvested from these frameworks, from the research literature, from workshops of OER experts and from individual OER experts around the world. The result has been a short-form T.I.P.S. framework where the TIPS acronym stands for the Teaching and learning process, the Information and material content, the Presentation, product and format, and System, technical and technology. It has been stressed that these guidelines should be user-friendly in an accessible manner so that readers can easily grasp the intended meaning and purpose. More than two-hundred criteria in a somewhat technical language have been collated for those who would like a more exhaustive coverage. However the present report is offered as a simplified tool that teachers around the world can read and find useful. Institutions using OER and creating OER can also adopt these guidelines for their internal quality assurance purposes.

1 INTRODUCTION

1.1 Background about OER

There is a current global movement towards open digital reusable educational resources. Most reports on open educational resources (OER) and open educational practice (OEP) start by clarifying their understanding and definition of the terminology. In particular they offer their interpretation of the meaning of ‘open’ as used in the expression ‘open educational resource’ and in other expressions especially ‘open content’ and ‘open access’. Now ten years old, the historic definition of OER is essentially functional to allow legal safety to anyone reusing OER without paying royalties and without having to apply to the copyright owner for permission to reproduce the resource. The historical *functional* definition of OER was given by UNESCO (2002, p.1) as “*technology-enabled, open provision of educational resources for consultation, use and adaptation by a community of users for non-commercial purposes ... typically made freely available over the Web or the Internet*”. In simple words, the term *open educational resource* (OER) is used here to mean a small self-contained unit of self-assessable teaching with a measurable learning objective, often in digital electronic format and generally free to use.

The history of open educational resources has some similarities to the earlier Reusable Learning Objects (RLOs). The earlier RLO movement had trouble with costs and sustainability, and attaching an open licence to OER is proving to be an efficient way to avoid the problems encountered by RLO. RLOs are small context-free chunks of teaching. The term ‘learning object’ was first proposed by Wayne Hodgins in 1994 (Polsani, 2011). The metaphor as lego building bricks was suggested by Gibbons, Nelson & Richards (2000), and as Meccano by Gerard (1969) as “curriculum units can be made smaller and combined into a great variety of particular programs custom-made for each learner”.

The reusable learning object movement seems to have slowed down in large part due to its lego-block one-size-fits-all industrialist approach and also because it does not cater to the teachers’ and learners’ needs: no *Needs Analysis* has been done, and indeed with context-free highly reusable RLO where the end-users are unknown, it is difficult to see how a meaningful *Needs Analysis* could be done. Even if an initial survey is performed, valid and reliable *Needs Analysis* must be performed in the end-users local context, initially and continuously throughout the course (since the aim of education is to change their minds). The RLO economy faced the early challenge of content localisation involving retrieval, adapting and

re-purposing content. These RLO problems have largely been resolved for OER by open licensing such as the Creative Commons licences.

The initial challenge for RLO (and for the OpenCourseWare (OCW) and OER movements) was to hold a threshold number of units to make sharing an attractive proposal. The received benefit had to be large enough to stimulate participation. The OCW movement requested a member to put into the pool a minimum number of courses, and could then receive access to the hundreds there from other members. If teachers feel there is nothing worthwhile to be gained, then it is difficult to motivate them purely on philanthropic comfort.

Funding for higher education in developing countries pretty much dried up (by around 1990) when it became visible that only the rich students from elite ruling-class families availed themselves or were allowed access to the educational resources funded by international aid. Agencies then switched to funding primary education for all. Currently OER and Massive Open Online Courses (MOOCs) are funded by elite universities and the students engaging them are those already relatively well qualified. If OER are to fulfil a purpose to ensure education for all and education for the poor and underprivileged, then more OER should be designed for pre-tertiary education.

1.2 Rationale for these Guidelines

The purpose of this report is to stimulate the imagination of teachers as prospective authors of OER to reflect on possible ways they might adopt to build quality into OER created by them. This report collates ideas on quality to support a culture of quality surrounding the designing, testing out and sharing of OER, in local communities of practice. Teachers and their students - as prospective authors - are encouraged to reflect on these Guidelines and choose those they deem relevant to their wants and needs to create resources that are easily stored, reused and shared amongst themselves and other teachers and students. These Guidelines are not intended to be prescriptive in any way. In any case the situatedness of learning depends greatly on the culture and context of the authors, and they are best positioned to decide on which ideas are worthwhile adopting.

It has been remarked more than several times that these Guidelines are not that specific to OER and could be applicable to any learning materials. These remarks are quite correct, and as learning materials, OER indeed share much with non-OER materials. However OER are distinct in that they are digital and have an open licence attached to allow reuse, adaptation and sharing. Some other distinct properties are concerned with the technical aspects of open accessibility, discoverability, and adaptability. However, it is nonetheless recognized that many of the quality dimensions presented in the Guidelines here are naturally applicable to other learning materials.

The “open education movement combines the established tradition of *sharing good ideas with fellow educators and the collaborative, interactive culture of the Internet*. It is built on the belief that everyone should have the freedom to use, customize, improve and redistribute educational resources without constraint ... First, we encourage *educators and learners to actively participate* in the emerging open education movement. Participating includes: *creating, using, adapting and improving open educational resources*; embracing educational practices built around collaboration, discovery and the creation of knowledge; and inviting peers and colleagues to get involved.” (p1) The Cape Town Open Education Declaration, 2007, <http://www.capetowndeclaration.org>(emphasis added to underline the rationale and support the present Guidelines).

This report of suggested Guidelines focuses on offering ideas to teachers as creators of OER offering ways they could reflect upon in order to develop a culture of quality within their own respective local communities of practice. Teachers who embrace creating their own OER, potentially in collaboration with their own students, and sharing these OER, are likely to change fundamentally how people teach and learn. We also expect institutions supporting development and use of OER to adopt these Guidelines in their internal quality assurance practices.

1.3 Definitions of OER

The UNESCO (2002) original *functional* definition of OER was simply ‘free-of-cost’ to reuse. That definition uses ‘open’ as in ‘open courseware’ or ‘open content’, but does not include other aspects eg ‘open’ as in ‘open access’ or ‘open to places’. The definition of ‘open’ needs some more debate. Here the definition follows that suggested by Ross Paul (1993, p.116) simply to indicate that a particular educational system is more open than a previous alternative on any dimension. A definition by Perraton& Creed (1999, p.30) refers to ‘open’ learning as meaning education “in which constraints on study are minimised in terms of access, or time and place, pace, method of study, or any combination of these”. The definition of ‘open’ as in ‘open educational resource’ is given here as where constraints are minimised, compared with alternative practices, with respect to people, language, places, time, pace, methods of study, ideas, physical and/or online access, cost, flexibility, or any combination of these. The early definition of ‘open’ as free-of-cost needs widening for inclusivity eg to women, those with disabilities, minority languages etc beyond simply relating to money. Presenting criteria to evaluate the quality of e-learning, Ehlers (2012) adopts the meaning of ‘open’ as simply inclusiveness.

All of the above aspects relate to formal education. The definition could be widened to explicitly include non-formal education, thus open to society at large or open with respect to age could be added in the sense of OER being designed for lifelong learning.

Camilleri & Tannhäuser (2012, p.7) for the Open Educational Quality Initiative (OPAL, <http://www.oer-quality.org>) rewrite the UNESCO definition somewhat as “teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions”. The limited restrictions are summarised by Wiley (2009) in a 4R-framework of four rights, as follows:-

1. *Reuse : the right to reuse the content only in its unaltered form*
2. *Revise : the right to adapt, adjust, modify, or alter the content itself*
3. *Remix : the right to combine the original or revised content with other content to create something new*
4. *Redistribute : the right to make and share with others copies of the original content, your revisions, or your remixes*

In this 4R-framework, granting any one right makes the OER open, and granting all these four rights is at the most open. The copyright notices in order of openness, are shown in FIGURE 1 below according to Hodgkinson-Williams & Gray, 2008, with graphics drawn from <http://creativecommons.org/licenses>, based on the Creative Commons licences developed by Lessig (2001). The most open are those with no rights attached that are in the public domain such as many of those offered by ERIC <http://www.eric.ed.gov>. Camilleri & Tannhäuser (2012, p.16) confirm this as “what makes a learning resource ‘open’, is the licence it carries with it, i.e. that it carries a licence which at minimum allows reproduction and reuse of the resource”. This definition thus focused on cost and copyright. In clarification here Wiley & Green (2012, p.81) reiterated that these two aspects are actually only cost-related ; “In both cases, every person in the world enjoys free (no cost) access to the OER *and* free (no cost) permission to engage”. So the historical definition is free-of-cost, and purely *functional*.

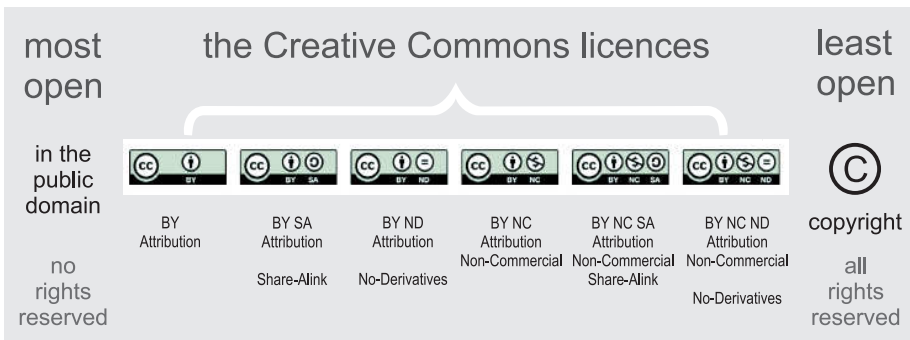


FIGURE 1: Openness and the Range of Creative Commons Licence Labels

The original definition of OER by UNESCO (2002, p.1) as technology-enabled and available over the web or Internet is made more open here to include materials, such as radio, television, audiovisual materials, and photographic or printed formats. It is also extended to include artifacts, lyrics, storytelling, speeches, drama, theatre and other performances that might be used for teaching (eg a 3D model of an atom, or a working model steam engine, where these are downloaded from a digital store and reconstructed as a physical object, similar to printing out online text for offline study). The issue here is whether OER applies only to the digital item or also to pre-digital state and to its re-constituted physical state.

While the OPAL definition by Camilleri & Tannhäuser (2012, p.7) refers to OER as being teaching, learning and research materials, the new definition here recognises that the teaching materials be designed for learning, and for no other purpose, and similarly that research materials too are for learning. Since the materials are for teaching oneself or others to learn, the definition employs the expression ‘self-assessable teaching’ where self-assessable covers the metacognitive awareness of the users and end-users to know what is being taught and learnt. The term ‘self-assessable’ here also means that assessment questions and answers are built into the OER, and where possible these questions should be open-response-type concept questions testing comprehension of ideas, rather than relying only on memory and recall as in some closed-response multiple-choice questions.

An early definition of OER by Weller (2009) was as a Big-OER or as a Little-OER, originally suggested by Michelle Hoyle concerned about OER production costs. The Big-OER were released by an institution after in-house QA and were generally expensive to produce, while Little-OER were small easily re-purposed context-free chunks similar to RLO.

“Big OERs are institutionally generated ones that come through projects such as openlearn. Advantages = high reputation, good teaching quality, little reversioning required, easily located. Disadvantages = expensive, often not web native, reuse limited.”

“Little OERs are the individually produced, low cost resources that those of us who mess about with blogs like to produce. Advantages = cheap, web (2) native, easily remixed and reused. Disadvantages = lowish production quality, reputation can be more difficult to ascertain, more difficult to locate.” (p.2)

Plotkin, (2010, p.1) defines OER as *“teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits sharing, accessing, repurposing – including for commercial purposes”*

The definition of ‘open educational resource’ (OER) is suggested in BOX 1 below, It was pointed out in the 2012 Seminar by OER-Asia that the UNESCO-2002 definition needs to be extended in coverage, eg. that OER be ‘relating to education - teaching and learning’ not simply free-of-cost to reuse. The present definition here incorporates the current views on how to define OER.

BOX 1 : Definition of ‘Open Educational Resource’

An ‘open educational resource’ (OER) is defined as a technology-enabled self-contained unit of self-assessable teaching with an explicit measurable learning objective, being at some point in time in digital electronic format and generally free-of-cost to use. Accordingly it has an open licence attached. Additional attributes that are desirable but not essential include having vertical before-and-after links to other OER to form a suggested learning pathway, and embedded horizontal links within itself to other OER to offer added content to enrich the learning experience, and to offer alternative pathways. It should be designed to be easily adaptable by reusers, should be easy to download for use offline, is portable, and is transmissible across platforms. It should have metadata tags sufficient for discoverability, and has a built-in facility to include social tagging by end-users.

2 METHODS

2.1 Defining Quality

Teachers in different contexts potentially hold various different perspectives on what constitutes quality in their own situation. Moreover some teachers may want a wider quantity of OER even at the cost of quality, and technically high-quality OER can sometimes lack essential utility - so that accessibility is reduced, particularly where high bandwidth is needed to download complex multimedia OER. While quality is very much in the eye of the beholder, we can conceive of three fields of quality. The first two - of quality as a product, and of quality as a process - are well known. As a product, an OER can be released with the logo or brand-name of an institution concerned with preserving and/or improving the reputation of the institution. Compliance to government regulations on accessibility for instance is legally binding on institutions. Many institutions have in place QA systems to assess OER quality before releasing the OER to the public. Beta-testing is also a way to determine product quality before public release. As a process, metadata tags can be completed by end-users of the OER to offer feedback and comments for future reusers. Provided such comments are moderated then they could be interpreted as defining quality in a continuous ongoing fashion, ie of quality as a process. We believe that the educational experience is much more than simply producing free online content (irrespective of it being high quality content). Accordingly the present Guidelines are more interested in nurturing the idea of quality as a culture.

Developing a culture of quality may be the best way forward rather than either advocating resources as quality products or simply promoting quality practices and quality processes. A few years ago, Andy Lane suggested that the OER benefits may come through teachers reviewing and improving their own educational practices (Hodgkinson-Williams, 2010, p.11) and it is this culture of professional reflection that we intend to stimulate with these Guidelines.

2.2 Review of Quality Frameworks

More than thirty frameworks of quality dimensions were discovered in the literature, and fifteen of these were of sufficient merit and relevance to be then explored in detail to extract dimensions and sub-dimensions of quality related to learning materials. These frameworks are those reported by Achieve (2011), Bakken &

Bridges (2011), Baya'a, Shehade & Baya'a (2009), Binns & Otto (2006), Camilleri & Tannhäuser (2012), CEMCA (2009), Ehlers (2012), Frydenberg (2002), Merisotis & Phipps (2000), Khan (2001), Khanna & Basak (2013), Kwak (2009), Latchem (2012), McGill (2012), Quality Matters Program (2011), and SREB - Southern Regional Education Board (2001) in alphabetical order. Some interesting observations were expressed in these reports on other frameworks, eg. Frydenberg (2002) reported that the e-learning field was finding it difficult to cope with student expectations - and this is true perhaps for OER. The SREB (2001) reported that design quality should move beyond delivery of content knowledge also to include, if possible, abstract thinking and critical reasoning to imbue the higher-order thinking skills - and this was for K6-12 students. This point remains a challenge for prospective authors of OER. The SREB also called (2001, item 1.8) for the e-learning course to provide the student with "access to resources that enrich the course content" which could be translated as horizontal links in OER to other materials.

Briefly the other frameworks are described next in alphabetical order of first author.

Achieve (2011) gives eight criteria areas in a framework called Achieve-OER-Evaluation to assess OER quality according to the USA common core state standards for curricula, as follows:- (i) Degree of Alignment to Standards, (ii) Quality of Explanation of the Subject Matter, (iii) Utility of Materials Designed to Support Teaching, (iv) Quality of Assessment, (v) Quality of Technological Interactivity, (vi) Quality of Instructional Tasks and Practice Exercises, (vii) Opportunities for Deeper Learning, and (viii) Assurance of Accessibility. The Achieve company is set up by the *Institute for the Study of Knowledge Management in Education (ISKME)* that is run by the repository *OER-Commons*. The technical language used is intractable and a barrier to adoption.

Bakken & Bridges (2011) give five criteria areas for online primary and secondary school courseware, as follows:- (i) Content, (ii) Instructional Design, (iii) Student Assessment, (iv) Technology, and (v) Course Evaluation and Support. These are international standards and could be useful for adopting in creating OER for school-level student end-users.

Baya'a, Shehade & Baya'a (2009) give four areas for evaluating web-based learning environments: (i) Usability (Purpose, Homepage, Navigation, Design, Enjoyment, Readability), (ii) Content (Authority, Accuracy, Relevance, Sufficiency, Appropriateness), (iii) Educational Value (Learning activities, Activity plan, Resources, Communication, Feedback, Rubric, Help tools), and (iv) Vividness (Links, Updating).

Binns & Otto (2003) give four criteria areas as the quality assurance framework for distance education, as follows:-*Products, Processes, Production* and delivery, and general *Philosophy* of the institution. These four areas were earlier suggested by

Norman (1984), and Robinson (1993) has reported these four used in Uganda together with the various components under each category (both cited in Binns & Otto, 2003, pp.36-38). The four-P framework may be relevant to developing regions where OER are used in face-to-face classrooms.

Camilleri & Tannhäuser (2012, drawn from pp.17-19) give eight dimensions as technical criteria and two as pedagogical criteria, as follows:- (i) Compatibility with a Standard, (ii) Flexibility and Expandability, (iii) Customization and Inclusiveness, (iv) Autonomy of the users during the interaction with the multimedia resources, (v) Comprehensibility of the graphic interface, (vi) Comprehensibility of learning contents, (vii) Motivation, engagement and attractiveness of the OER modules and/or learning resources, (viii) Availability of reporting tools (e-Portfolio), (ix) Cognitive: Interaction between the OER and Learner, and (x) Didactic: Instructional Design of the OER. The coverage by Camilleri & Tannhäuser (2012) is not comprehensive; eg there are twelve known educative interactions in the known literature, and Camilleri & Tannhäuser give only two:- the T-Ss and S-Ss interactions. Of the five domains of learning, Camilleri&Tannhäuser give only two: the cognitive, and metacognitive. Of the six cognitive processes, Camilleri & Tannhäuser give only two; reproductive (recall), and constructive (synthesis), and so on. Their model does offer however a framework on which to construct a full model of quality criteria.

CEMCA (2009) presents five criteria areas in an interesting Quality Assurance of Multimedia Learning Materials (QAMLM) framework based on the ADDIE model of instructional design. The ADDIE model is a process consisting of five stages:- Analysis, Design, Development, Implementation, and Evaluation. It can be used iteratively, and has some relevant shared fit with creating OER.

Ehlers (2012) gives seven criteria areas for quality assurance of e-learning courses as follows:- (i) Information about + organization of programme, (ii) Target Audience Orientation, (iii) Quality of Content, (iv) Programme Course Design, (v) Media Design, (vi) Technology, and (vii) Evaluation & Review. The second of these concerns *Needs Analysis* which may be problematic in OER, and also the last on evaluation can be difficult where students give anonymous feedback as social tags.

Frydenberg (2002) gives nine criteria areas as domains of e-learning quality, as follows:- (i) Institutional Commitment, (ii) Technology, (iii) Student Services, (iv) Instructional Design and Course Development, (v) Instruction and Instructors, (vi) Delivery, (vii) Finances, (viii) Regulatory and Legal Compliance, and (ix) Evaluation. These were labelled as Domains. There was no discussion beyond noting these nine were harvested from the literature.

Khanna & Basak (2013) give six criteria areas, as follows:-(i) Pedagogical, (ii) Technological, (iii) Managerial, (iv) Academic, (v) Financial, and (vi) Ethical. This set is interesting since they also give five levels of depth to these areas:- (1 - highest) IT infrastructure - services and networking, (2) Management support

systems, (3) Open content development and maintenance, (4) Open (online / public) teaching and learning, and (5) Learner assessment and evaluation. The six areas of Khanna & Basak (2013) are taken from Khan (2001, p.77) who gives eight, as follows:- (i) Institutional, (ii) Pedagogical, (iii) Technological, (iv) Interface Design, (v) Evaluation, (vi) Management, (vii) Resource Support, and (viii) Ethical.

Kwak (2009) gives twelve criteria areas in a framework that has ISO-9001 certification, as follows:- (i) Needs Analysis, (ii) Teaching Design, (iii) Learning Content, (iv) Teaching-Learning Strategy, (v) Interactivity, (vi) Support System, (vii) Evaluation, (viii) Feedback, (ix) Reusability, (x) Metadata, (xi) Ethics, and (xii) Copyright.

Latchem (2012, pp.81-86) gives four areas of criteria for quality assurance, as follows: (i) Immediate Outputs, (ii) Short-or-medium-term Outcomes, (iii) Long-term Impacts, and also (iv) Inputs.

McGill (2012) gives five criteria areas for determining the quality of OER, as follows:- (i) Accuracy, (ii) Reputation of Author / Institution, (iii) Standard of Technical Production, (iv) Accessibility, and (v) Fitness of Purpose. This framework is advocated by the institution-group HEA and JISC. They only lastly give consideration to the students and the OER being fit for use.

Merisotis & Phipps (2000) give seven criteria areas, as follows:- (i) Institutional Support, (ii) Course Development, (iii) Teaching/Learning, (iv) Course Structure, (v) Student Support, (vi) Faculty Support, and (vii) Evaluation and Assessment.

The Quality Matters Program (2011) gives eight criteria areas as a checklist for certifying the quality existing in online and blended courses, as follows:- (i) Course Overview and Introduction, (ii) Learning Objectives (Competencies), (iii) Assessment and Measurement, (iv) Instructional Materials, (v) Learner Interaction and Engagement, (vi) Course Technology, (vii) Learner Support, and (viii) Accessibility. The full QMP document is not open access.

The SREB - Southern Regional Education Board (2001) gives three criteria areas for K6-12 web-based courses, as follows:- (i) Curriculum, Instruction and Student Assessment, (ii) Management, and (iii) Evaluation of Delivered Courses. Of note they call for e-learning courses to impart the higher-order critical thinking skills to school children.

The above frameworks are inconsistent with each other in their top-level categories, and in their coverage. They have each been re-tabulated to explore better any similarities or crossover, and a review of them has been done and is available at <http://www.open-ed.net/oer-quality/others.pdf>. Findings show they could not be combined together, and rather served merely as *ad hoc* collections to be reviewed line by line. There thus became a need to find some framework that was comprehensive, with literature support, and which dealt with all the various aspects being used by other frameworks.

In order to collate the miscellaneous ideas of other frameworks and the ideas from the literature, and from online discussions with OER experts around the world, a five-dimension framework of the educational objectives was used as a scaffold. This scaffold is that which covers the educational objectives, and has the top-level dimensions of the *Cognitive Domain*, the *Affective Domain*, the *Metacognitive Domain*, the *Environment Domain*, and the *Management Domain*.

2.3 Conversations in the Cyberspace

About 60 experts were consulted through email to gather criteria for quality assurance of OER. Several experts raised the issue of sustainability and the costs involved to create good quality OER. However those concerns focused on quality as a product, whereas the present Guidelines set out to initiate and nurture a culture of quality among teachers as creators of their own OER, developing communities of practice locally that adopt aspects of quality that best suit their own situations. Therefore costs are not front-loaded or even noted, since the teachers discuss among themselves how best to make OER and share these with their colleagues. The only costs involved would be the opportunity costs (them not doing other activities which might bring in cash), their time and efforts. Given that the teachers will see that they can save time and effort in the foreseeable future through building OER, the sustainability and cash costs should be minimal. Discussion on the recovery of costs where they exist and discussion of sustainable business models for institutions to re-design and release OER are outside the scope of this report. More on this aspect is available in a COL publication by Butcher & Hoosen (2012).

2.4 Initial Framework

At first a scaffold was drawn up onto which all the different ideas from the literature, from conversations, workshops and from other frameworks could be positioned.

When we adopt fitness-for-purpose as the overriding concern for defining the quality of an OER, then this suggests we focus on the learning achieved by the students who use the OER. There are five and only five *Domains of Learning*, focusing on achieved learning by students, and which cover all known educational objectives. Thus the *Domains of Learning* could be a good Framework as a basis, and onto which to position the various components concerning quality for OER.

According to some reports the quality of an OER should be determined by the subject content material (which is in the *Cognitive Domain of Learning*), while others have said the OER should be interesting and fun for the student (in the *Affective Domain*). Built-in self-assessment has also been advocated (in the *Metacognitive Domain*), accessibility and localisation (in the *Environment Domain*), and discoverability

as well (in the *Management Domain*) have been suggested. Briefly the five *Domains* and their respective coverage are summarised below. Together these constitute a full comprehensive model of learning, to serve as the basis of the Project-Framework here.

1. *Cognitive Domain* : the content knowledge, content skills, and reflective critical thinking skills to be learnt
2. *Affective Domain* : the motivations, attitude and decision to initiate performance, learner independence and autonomy
3. *Metacognitive Domain* : understanding how the task is performed, and the ability to self-monitor, evaluate and plan own future learning
4. *Environment Domain* : the localisation, artistic presentation, language, multimedia, interactivity, and embedded links to other content
5. *Management Domain* : discoverability, tagging, including for time management, transmissibility, business models

Some popular concerns are regarding accuracy and academic validity, which are in the *Cognitive Domain*. There is also awareness to initiate each of the various motivations to learn in the *Affective Domain* and how to help a student who develops a mood due to the content being overly difficult. The other three *Domains* are much less recognized, except for the *Management Domain* where a few aspects are now popularly mentioned such as searching skills, discoverability and coping with the massive amount of data available these days through the web.

Within each of the five *Domains*, categories as sub-dimensions were developed through a grounded theory approach. These are shown in TABLE 1 in the next page. The full Framework currently suggests more than 200 criteria to reflect upon, is available at <http://www.open-ed.net/oer-quality/criteria.pdf>.

2.5 Regional Consultation Workshop at Hyderabad

The collated list of criteria through online consultations and literature review were presented before group of experts in a workshop mode in the Regional Consultation Workshop on Developing Quality Guidelines for Open Educational Resources held at Maulana Azad National Urdu University, Hyderabad on 13-15 March 2013. Expert participants also presented their views about quality issues during this workshop. Three outputs in particular are worth noting from the workshop. One is the construction of guidelines on quality, for teachers and/or students as original authors or adapters of OER. Another is the suggestion on development of a training module (much like that used for online tutor training) for these authors and adapters, with built in examples, models, templates and so forth. The third is the concept of a new domain suffix as (dot).oer. While this third output initially related to discoverability concerns, what with the millions of

already existing OER many of doubtful quality and reusability, the domain.oer could serve as a white-list of good quality OER from now onwards. It could serve as a process gateway through which people prepare their OER conscientiously. So that rather than dumping out-of-date lectures, the authors prepare good quality OER.

During the workshop, the five-domain quality framework presented was discussed in groups, and a shorter framework entitled TIPS was created, where the acronym TIPS is used to provide the top-level categorisation of criteria under the headings; (T) Teaching and Learning, (I) Information and Content, (P) Presentation, and (S) System.

TABLE 1: *Categories within the Dimensions of the Five-Domains Framework*

1. Content - Cognitive Domain:	
1.1	knowledge and skills content
1.2	pedagogy
2. Student Motivation - Affective Domain:	
2.1	extrinsic motivation
2.2	intrinsic motivation
3. Student Autonomy - Metacognitive Domain:	
3.1	self-awareness & self-assessment of learning
3.2	external evidence
4. Access - Environment Domain:	
4.1	financial cost
4.2	technical accessibility
4.3	cultural and contextual localisation
4.4	presentation and multimedia
4.5	community
5. Packaging - Management Domain:	
5.1	tagging for discoverability
5.2	utility
5.3	external validity

3

CONCLUSIONS

3.1 The TIPS Framework

The final Framework consists of four dimensions, involving 19 categories as sub-dimensions and overall 65 criteria. These are shown in TABLES 2a-d below. It should be emphasized that this Framework is put forward to stimulate feedback on its efficacy for authors, and the Framework is expected to be revised to take into account the feedback received from individual authors, future workshops and from OER experts around the world.

TABLE 2a: *The T.I.P.S. Framework: Teaching and Learning Processes*

1. Teaching and Learning Processes	
Pedagogy	1.1 Consider giving a study guide for how to use your OER, with an advance organiser, and navigational aids
	1.2 Use a learner-centred approach
	1.3 Use up-to-date appropriate and authentic pedagogy
	1.4 Use methods that involve transfer to external situations, model future applications by the student and encourage further innovation
	1.5 Include schema activation cues wherever possible, bringing in the culture of the student
Rationale	1.6 You should clearly state the reason and purpose of the OER, its relevance and importance
	1.7 It should be aligned to local wants and needs, and anticipate the current and future needs of the student
	1.8 Illustrate the intended benefits to the student and where possible relate these to employable skills. You could add comments from potential employers
	1.9 Clearly state the intended age and/or level of your intended student

Student	1.10	Bear in mind your aim to support learner autonomy, independence, learner resilience and self-reliance
	1.11	Aim to engender a sense of self-worth in the student
Language	1.12	You should adopt a gender-free and user-friendly conversational style in the active-voice
	1.13	Don't use difficult or complex language, and do check the readability to ensure it is appropriate to age/level
Interactivity	1.14	Include learning activities, which recycle new information and foster the skills of learning to learn
	1.15	Say why any task-work is needed, with real-world relevance to the student, keeping in mind the work needed to achieve the intended benefit
Motivational	1.16	Accurately express the study work-load
	1.17	Consider offering a badge to reward initial engagement, progression, and/or final completion.
	1.18	Stimulate the intrinsic motivation to learn, eg through arousing curiosity with surprising anecdotes
	1.19	Reveal the discipline through your own eyes, conveying a passion for the discipline
Assessing	1.20	Offer academic credit upon successful completion, and/or suggest examinations for credit
	1.21	Monitor the completion rate, student satisfaction and whether the student recommends your OER to others
	1.22	Try to positively influence the personality of the student.
	1.23	Include a variety of self-assessments such as multiple-choice, concept questions, and comprehension tests
	1.24	Provide a way for the student and other teachers to give you feedback and suggestions on how to improve
Support	1.25	Link formative self-assessment to help mechanisms
	1.26	Try to offer learning support
	1.27	Your OER should point users to community groups

TABLE 2b: *The T.I.P.S. Framework: Information and Material Content*

2. Information and Material Content	
Accuracy	2.1 Make sure that the knowledge and skills you want the student to learn are up-to-date, accurate and reliable. Consider asking a subject-matter expert for advice
	2.2 Your perspective should support equality and equity, promoting social harmony, and be socially inclusive, law abiding and non-discriminatory
Relevance	2.3 All your content should be relevant and appropriate to purpose. Avoid superfluous material and distractions
	2.4 Consider linking with external examinations and/or national curriculum standards
	2.5 Your content should be authentic, internally consistent and appropriately localised
	2.6 To induce learning, include anecdotal misunderstandings and their consequences
	2.7 Encourage student input to create localised content for situated learning : draw on the student's prior learning and experience, and the student's empirical and indigenous knowledge
Content Load	2.8 Try to keep your OER compact in size, while allowing it to stand-alone as a unit for studying by itself. Consider whether it is small enough to reuse in other disciplines
	2.9 Add links to other materials to enrich your content

TABLE 2c: *The T.I.P.S. Framework: Presentation, Product and Format*

3. Presentation, Product and Format	
Openness	3.1 Be sure the open licence is clearly visible
	3.2 Try to reuse other OER as components
	3.3 Try to indicate if your OER is closed in any way eg. if your OER is localized to a specific culture, or if content might be inappropriate for some unintended users
	3.4 Ensure your OER is easy to access and engage
	3.5 Clearly give the original author contact information

Multimedia	3.6	Multimedia should be limited to two or three types
	3.7	Try to serve a variety of learning styles - keeping in mind a student might have weak eyesight or hearing
	3.8	Present your material in a clear, concise, and coherent way, taking care with sound quality
	3.9	Avoid using a 'talking head' video of the lecturer
	3.10	If you use any theme music, try to make this appropriate to the local culture and context
Design	3.11	Put yourself in your student's position to design a pleasing attractive design, using white-space and colours effectively, to stimulate learning
	3.12	Have some space for adding moderated feedback later on from your students
Format	3.13	Consider whether your OER will be printed out, usable off-line, or is suitable for mobile use
	3.14	Consider alternate fonts and font-sizes suited to the student, for inclusion eg to serve old-aged students
	3.15	Use open formats for delivery of OER to enable maximum reuse and re-mix.
Pathways	3.16	Consider suggesting which OER could come before your OER, and which OER could come afterwards in a learning pathway
	3.17	Consider offering alternative OER to your presented OER to give choices in learning pathways

TABLE 2d: *The T.I.P.S. Framework: System, Technical and Technology*

4. System, Technical and Technology		
Discoverability	4.1	Consider adding metadata tags about the content to help you and others later on to find your OER
	4.2	Give metadata tags for expected study duration, for expected level of difficulty, format, and size
	4.3	Try to use only free sourceware/software, and this should be easily transmissible across platforms
	4.4	Try to ensure your OER is easily adaptable, eg separate your computer code from your teaching content

Technology	4.5	If using any voice or music, try to keep this separate from the computer code to allow easier translation or re-localisation
	4.6	Your OER should be easily portable and transmissible, and you should be able to keep an off-line copy
	4.7	Your OER and the student's work should be easily transmitted to the student's own e-portfolio
Technical	4.8	Give alternate ALT text for each image
	4.9	Include a date of production, and date of next revision
	4.10	Point users to appropriate technical support groups
	4.11	Consider allowing social tags to allow any student or teacher to add a review
	4.12	Consider adding metadata tags to allow students to give feedback on the immediate output, short-term outcome, and long-term impact

3.2 Referrals & Validations

These Guidelines have been collated from online discussions with OER communities and referred to about 60 experts in the OER field around the world for feedback, comments and suggestions on how to improve them. Workshops have been held in India and in Britain, and feedback from participants has been digested and incorporated wherever practical. Further validations are on-going and are planned during the coming year(s). Readers and practitioners are urged to try out these Guidelines and to report back their own experiences.

4 USING THE GUIDELINES

The TIPS Framework offers guidelines to prospective OER authors who are teachers or students. These persons either as individuals, in partnership with subject-matter-experts, or in teams of like-minded authors are invited to read through these criteria given here as ideas for improving the quality of the authored OER. There are several reasons for trying to improve the quality of any OER -- one is to develop professional reflection-in-action and so improve individual practice, another is to improve our own teaching efficiency by recording and storing content for reuse later on, and thereby save on own future time, effort and costs, and one other reason is to share ones work with others either locally or around the world so as to promote education for all.

Prospective authors are encouraged to look at their own teaching materials - such as syllabus, lesson plans, detailed notes and content materials. After this they can read through these Guidelines and see ways in which they might choose to adapt or re-write their materials so as to make storing and retrieval easier. After re-writing, they can share with a colleague and perhaps after testing out the OER, the two of them can talk about further ways to improve the quality when these Guidelines are also expected to be of some use.

Of secondary purpose, teachers or students after reading through these Guidelines might feel better able to judge the quality of OER they retrieve from the Internet. In both cases of authoring and of re-using OER, these Guidelines aim to stimulate the gradual development of a culture of quality surrounding the use, reuse and sharing of OER to generally improve teaching and learning.

5 FUTURE

We visualize the presented set of 65 criteria as version 1 of the TIPS framework. Over the next years, we expect that teachers in educational institutions will adopt these criteria relevant to their context and provide us feedback to further polish and refine the language as well as usability of the document. We will also undertake analysis of the content validity of the criteria and explore the feasibility to develop a rating scale around a specific set of criteria to help development of an online application/system to allow users' rating of OER based on criteria chosen by them. Thus, CEMCA will continue to create awareness about the quality assurance of OER and further improve the quality of the TIPS framework. Your comments and suggestions in the process are highly welcome.

6

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