Open Educational Resources :
Other Frameworks

Paul Kawachi   FRSA
kawachi@open-ed.net

OVERVIEW :

This Paper presents other frameworks discovered in the literature which might be relevant to developing a *Project-Framework* of quality criteria for OER. Some metaanalysis of the main categories is given here. Those frameworks, which might be worthwhile reviewing for suggestions, are preselected, redrawn with categories numbered for easy reference, and given here in full in the respective Appendix at the end. There are nine frameworks reviewed here and available for discussion.

At the beginning of this *Project*, there is a plan to gather as far as possible the available published frameworks of QA criteria, and then somehow to collate these frameworks by putting them alongside each other in juxtaposition to see commonalities : the similarities and differences. As these were gathered it became apparent that most were *ad hoc* subjective listings of whatever came to the mind of the author at the time of writing - with little if any overarching organisation. Therefore recourse was made to the comprehensive framework of all the educational objectives consisting of the five *Domains of Learning*. Then the criteria from other frameworks can be positioned onto this *Domains of Learning* scaffold, prior to being reviewed, compartmentalised and then labelled through a grounded theory approach.

OTHER FRAMEWORKS :

Criteria are listed below drawn from a review of the literature for evaluating the quality of learning objects, e-learning, web-based learning environments, courses and programmes, and other relevant materials. Some share sufficient fittingness to consider adopting for the criteria given in *Project-Framework*.

Four criteria were suggested by Baya'a, Shehade & Baya'a (2009) 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).

Colin Latchem (2012, pp.81-86) gives criteria for quality assurance of *Immediate Outputs*, *Short-or-medium-term Outcomes*, *Long-term Impacts*, and also *Inputs*. The most relevant categories and criteria are shown in his TABLE 5. All the items from Latchem *Outcomes* are included into the final Framework.

Sreedher (2009) gives 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. The QAMLM is re-drawn as appendix3.

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.

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..

Camilleri & Tannhäuser (2012, drawn from pp.17-19) give eight dimensions as technical criteria and two as pedagogical crieria, 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.

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.

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.

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.

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.

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.

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.

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.

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. Their criteria are very closely similar to those of the Sloan Consortium (Sloan, 2013).

Sloan (2013) give nine criteria areas, as follows ;- (i) Institutional Support, (ii) Technology Support, (iii) Course Development and Instructional Design, (iv) Course Structure, (v) Teaching and Learning, (vi) Social and Student Engagement, (vii) Faculty Support, (viii) Student Support, and (ix) Evaluation and Assessment.

Jung & Lee (2014) give eleven criteria areas, as follows ;- (i) Infrastructure, (ii) Quality Assurance, (iii) Institutional Vision & Support, (iv) Finance & Partnership, (v) OER Development, (vi) Learning Content, (vii) Learning Support, (viii) Student Support, (ix) Learning Outcomes, (x) Return on Investment, and (xi) Research & Development. These are taken here from their as-yet-unpublished survey asking any respondents to rank their institutional level of practice against each criterion.

Mhlanga (2010) gives thirteen criteria areas, as follows ;- (i) Policy and Planning, (ii) Learners, (iii) Programme Development, (iv) Course Design, (v) Course Materials, (vi) Assessment, (vii) Learner Support, (viii) Human Resource Strategy, (ix) Management and Administration, (x) Collaborative Relationships, (xi) Quality Assurance, (xii) Advocacy and Information Dissemination, and (xiii) Results. These criteria are intended for maintaining all aspects of quality in open schools, covering more aspects than other frameworks for course quality.

Williams, Kear & Rosewell (2012) give six criteria areas, as follows ;- i) Strategic Management, (ii) Curriculum Design, (iii) Course Design, (iv), Course Delivery, (v) Staff Support, and (vi) Student Support. These criteria are given in good detail for benchmarking the quality of e-learning programmes.

Leacock & Nesbit (2007) give nine criteria areas, as follows ;- (i) content quality, (ii) learning goal alignment, (iii) feedback and adaptation, (iv) motivation, (v) presentation design, (vi) interaction usability, (vii) accessibility, (viii) reusability, and (ix) standards compliance. These are each broadly explained by a phrase, with no other details : eg (i) content quality : "veracity, accuracy, balanced presentation of ideas, & appropriate level of detail".

Vuorikari (2003) for the European Commission schoolnet gives five criteria, as follows ;- (i) appropriateness, (ii) clarity, (iii) completeness, (iv) motivation, and (v) organisation. Of particular relevance, they collect learning resources for school teachers that meet their own quality standards, and offer clear simple suggestions for teachers, and give a second different set of criteria for repository owners. [In other words they give QA criteria at level-2 for teachers, and another set of criteria at level-1 for repositories.] The European Schoolnet is building a learning resource exchange http://lre.eun.org that is now the largest in Europe, and one of the largest in the world, with 248,000 resources (collected from 58 repository providers) where each resource has been pre-validated for quality for reuse by school teachers. Of these 20,000 have been validated at level-3 in-class reuse, given at http://lreforschools.eun.org/web/guest/travelwell-all .

Leicester University (2010) in their OTTER (open transferable and technology-enabled educational resources) Project gives five criteria, as follows ;- (i) content, (ii) openness, (iii) reuse, (iv) repurpose, and (v) evidence. These comprise their CORRE framework, and are intended to be applied criterion by criterion in turn moving from producing the teaching material, to making it publicly usable, and then into an OER. While they say that quality is decided by the [end-] user, the framework is intended for the author to build in quality. Of note they include novel (v) evidence criteria which say that the resource must be trackable, and must be validated by users.

The JISC (2011) in their TIGER (Transforming Interpersonal Groups through Educational Resources) project gives seven criteria as follows ;- (i) input, (ii) reviewing, (iii) copyright, (iv) technical, (v) validation, (vi) feedback, and (vii) evaluation. [The headings here are revised slightly from their original to improve readability.] They give "Uploaded to each agreed platform (TIGER repository + link from JorumOpen)" which is rewritten as 'clearly include its own URL web-link'. These criteria are very similar to those of Leicester University (2010) - which is a partner with DeMontford University and Northampton University in this JISC project for health-related online resources.

Alberta University (2014) in their Essential Quality Standards 2.0 for online courses give seven criteria as follows ;- (i) web design standards, (ii) course information standards, (iii) writing standards, (iv) resources standards, (v) organization standards, (vi) pedagogy standards, and (vii) technology standards multimedia.

Of interest Alberta University (2014) suggest the criterion-1.1 that the design adopts a consistent format throughout and criterion-1.3 that navigation is consistent, predicable and efficient (somewhat related to our criterion-1.1.2, but added as criterion-4.4.9, and into TIPS criterion-3.8 and P-2). Consequently our criterion-5.1.8 is re-written to become 'navigational aids should be built-in, and these should be efficient, consistent and predictable'. Furthermore their criterion-7.2 that some orientation is given about the delivery technologies used (possibly related to our criterion-3.1.18 'advance organiser must be built in', and criterion-5.1.1, but added as new criterion-3.1.19 'technologies used given as orientation advance organiser'). While their criterion-2.3 that learning objectives be achievable is accounted for already by having the learning objective correlated to the level and age of the student (5.1.6 and 5.1.7), since this is important it is added as a new criterion-1.2.16 'learning objectives should be achievable'. Their criterion-6.1, that instructions for activities should be clear and complete, might seem obvious, but suggest to us that giving an example solution could help the student, thus two new criteria are added to take this into account as criterion-1.2.17 'learning activities must have clear instructions easily understandable' and criterion-1.2.18 'learning activities should be explained through examples'. Overall, a total of five new criteria (1.2.16, 1.2.17, 1.2.18, 3.1.19, and 4.4.9) are added into our collation of criteria and two were rewritten (5.1.8), on the suggestions by Alberta University (2014).

Casanova, Moreira & Costa (2011) give

Ehlers (2004) gives

Ossiannilsson, Williams, Camilleri & Brown (2015) give

> The purpose here is for Participants to explore *Other Frameworks* and thus become aware that they are not mutually comparable with each other, and moreover most are limited by their not being comprehensive in coverage. Accordingly the ad hoc subjectivity in these *Other Frajmeworks* lends strong support for adopting the five *Domains of Learning* as the comprehensive scaffolding. for the Proje*ct Framework*.

Paul look at
Higher Education Policy's report Quality on the Line: Benchmarks for Success in Internet-based Distance Education (2000).

Also OER ... learning objectives that are measurable === excludes the unmeasurable ones like transformative, love-of-learning etc, generosity

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APPENDICES :

Here TABLE 1 gives the source and location of other useful frameworks that might be worthwhile consulting for ideas to suggest criteria for OER QA. They are each redrawn with full citations and attributions, and available here offline and online at for example http://www.open-ed.net/oer-quality/others/appendix1.pdf

TABLE 1 : List of Frameworks found in the Literature

location	source
appendix1.pdf	Baya'a, Shehade & Baya'a, 2009
appendix2.pdf	Latchem, 2012
appendix3.pdf	Sreedher, 2009
appendix4.pdf	Ehlers, 2012

appendix5.pdf	Achieve, 2011
appendix6.pdf	Camilleri & Tannhäuser, 2012
appendix7.pdf	Quality Matters Program, 2011
appendix8.pdf	Bakken & Bridges, 2011
appendix9.pdf	Binns & Otto, 2006
appendix10.pdf	McGill, 2012
appendix11.pdf	Khanna & Basak, 2013 under review
appendix12.pdf	Kwak, 2009
appendix13.pdf	Frydenberg, 2002
appendix14.pdf	SREB, 2001
appendix15.pdf	Merisotis & Phipps, 2000
appendix16.pdf	Sloan Consortium, 2013
appendix17.pdf	Jung & Lee, 2014
appendix18.pdf	Mhlanga, 2010
appendix19.pdf	Williams, Kear & Rosewell, 2012
appendix20.pdf	Leacock & Nesbit, 2007
appendix21.pdf	Vuorikari, 2003
appendix22.pdf	Leicester University, 2010
appendix23.pdf	JISC, 2011
appendix24.pdf	Alberta University, 2014
appendix25.pdf	Casanova, Moreira & Costa, 2011
appendix26.pdf	Ehlers, 2004
appendix27.pdf	Ossiannilsson, Williams, Camilleri & Brown, 2015
appendix28.pdf	