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## Quality Framework for Assessment of Multimedia Learning Materials Version 1.0

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### Abstract

This paper reports about an instrument which has been developed by the Commonwealth of Learning Media Centre for Asia (CEMCA) and the Ministry of Higher Education, Malaysia (MOHE). This instrument aims to be a standard quality framework which can be used by multimedia users in evaluating the quality of the e-learning materials. Basically, the instrument is constructed to evaluate two sections, which are the learning material development process and the finished learning material product. However, this paper merely discusses the second section.

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## 1. Introduction

Multimedia learning materials(MLM) can be defined as the combination of various digital media types, such as text, images, sound and video, into an integrated multi-sensory interactive application or presentation to convey a message or information to learners that promotes effective learning (Neo and Neo, 2000). It is an important component in e-learning or distance learning. Studies have shown that MLM has a huge impact on the outcome of learning. A well designed MLM can promote better performance among learners. MLM that is designed using good teaching methodologies and instructional models can have a positive impact on the learners. MLM can be engaging, while simulated experiment and game-based learning can be fun for learners.

Today, large investments are made on developing MLM for teaching and learning. For example, as one of the flagship programs of the Multimedia Super Corridor (MSC), RM300m was allocated for smart schools where it involved the development of MLM for schools (Vicziány & Marlia, 2004). E-learning or distance learning can be supported by multimedia-rich content. It deploys videos, audios, animations, chats, interactive contents and other collaborative contents. The use of MLM makes learning interesting and fun. Hofstetter (1995) defined interactive multimedia as the use of a computer to present and combine text, graphics, audio and video, with links and tools that let the user navigate, interact, create and communicate. As more MLM are being developed, it becomes important to determine the quality of these products. Users need a guide to select and use these products. Users also need to know the quality of these products. Adopting poor quality content can result in poor performance of the learners and subsequently increase the drop-out rate.

### *1.1. Type of MLM Product Addressed by This Framework*

The type of MLM product referred here is the finished MLM used for the purpose of teaching and learning. The guidelines for the summative assessment of MLM is provided for MLM related to teaching and learning rather than other type of content such as for advertisement-based or entertainment. Assessment can be defined as evaluating the appropriateness of the material for the purpose. Formative assessment involves the judgment of the effectiveness and efficiency of the development process. Summative assessment involves the assessment of the completed MLM products. In formative assessment, the purpose is to improve the product during the development stage. Normally, the guidelines serve as strategy or plan that can be used to improve the product.

In summative assessment, the finished product is evaluated. The purpose of summative assessment is to make a decision to whether to adopt the product or, in some cases, to grade the product. The summative assessment determines the quality of the finished product. As MLM development is slowly taken over by production companies and publishers, summative assessment becomes more important to users, who could be students, teachers or other stakeholders.

Quality Framework for Assessment of MLM is divided into two parts – Part A and Part B. Part A covers the Pre-requisite Data for Assessment of MLM and includes some basic information relating to the MLM while Part B serves as an Assessment Guide for Multimedia Learning Materials and provides some useful guidelines to the evaluators/stakeholders for the assessment of MLM to minimise subjectivity.

### *1.2. The Construction QAMLM*

The idea of constructing the QAMLM was initiated by Commonwealth Educational Media Centre For Asia (CEMCA) during the 1<sup>st</sup> Roundtable Meeting with a group of experts in Bangalore, India on the 7<sup>th</sup> of August 2007. The meeting group agreed to have a standard framework as a guide for the learning

materials developers and the end users as well. They also agreed that the development of the framework should involve experts and stakeholders from various Asian countries. Two core groups – one in India and the other in Malaysia were constituted to undertake the development of the framework as a result of collaboration between CEMCA and Malaysia Ministry of Higher Education (MOHE) (CEMCA,2010). This followed by a series of roundtable meetings which was conducted involving experts from India, Malaysia, Sri Lanka, Brunei and Singapore.

The Indian core group merely concentrated on the first section which is the learning material development process where the Malaysian core group focused on the finished learning materials. Both groups have agreed to adopt ADDIE model (Analysis, Design, Development, Implementation and Evaluation) as an underlying theory to develop the framework. The first draft of QAMLM was tabled out in Dec 22<sup>nd</sup> 2008 and after 18 months of serious deliberation process which involved experts and stakeholders from various organizations around Southeast Asia. It was circulated widely to various stakeholders and hosted to CEMCA website and Wiki Educator of Commonwealth of Learning in order to get feedback from diverse parties in the world.

The draft framework for finished learning materials was tested rigorously by several content developers and users. Amendments were made based on the feedbacks from the pilot tests.

Table 1. Reliability of Three Pilot Tests

SECTION \ TEST	FIRST PILOT TEST 10 assessors	SECOND PILOT TEST 25 materials	THIRD PILOT TEST (Final)13 materials
OVERALL	.916	Too few cases	.900
ANALYSIS	.386	.338	.635
DESIGN	.816	.723	.737
DEVELOPMENT	.823	.786	.811
IMPLEMENTATION	.450	.327	.862
EVALUATION	-.353	Too few cases	All items have been removed

Table 1 summarizes the entire three pilot tests. The first pilot test was conducted by deploying 10 assessors to evaluate one multi-media learning material. The second pilot test on the other hand involved one assessor to evaluate 25 multi-media learning materials. Both results were presented to the panel of experts from Malaysia and India and resulting a more improved version or set of items. Based on the final version the third pilot test was conducted and the reliability values have met the acceptable value.

### *The MLM Framework Structure*

The MLM framework structure is divided in two parts:

- Part A addresses the pre-requisite data (14 items) for the assessment such as Information of the MLM like module title, target audience, language, minimum hardware and software requirement etc.

- Part B provides a set of quality indicators with 5 points scale (19 quality indicators) that help the users assess the quality of an MLM product. The higher the rating of the indicator the higher the quality of the MLM product.

*Who can use the Framework*

The framework is useful to those who use the MLM like learners, teachers, parents, administrators, librarians and etc.

Table 2 shows the final version of Quality Framework for Assessment of Multi-Media Learning Materials.

Table 2. Quality Framework For Assessment of Multimedia Learning Materials

**PART A: PRE-REQUISITE DATA FOR ASSESSMENT OF MLM**

<b>S. NO</b>	<b>QUALITY INDICATORS</b>	<b>DESCRIPTORS</b>	<b>SCORE</b>
	Part A : Information on MLM		Comments
A1	Reference Code:		
A2	Module Title:		
A3	Subject Area:		
A4	Coverage:		
A5	Keywords:		
A6	Language:		
A7	Target audience:	<input type="checkbox"/> Pre-school <input type="checkbox"/> Primary School <input type="checkbox"/> Lower Secondary school <input type="checkbox"/> Upper Secondary School <input type="checkbox"/> Undergraduate <input type="checkbox"/> Post-Graduate <input type="checkbox"/> General Public <input type="checkbox"/> Special needs (specify: _____) <input type="checkbox"/> Others (specify: e.g. Farmers) <input type="checkbox"/> Not Stated	
A8	Minimum Hardware Requirements stated:	<input type="checkbox"/> RAM Stated <input type="checkbox"/> Processor Stated <input type="checkbox"/> HDD Stated <input type="checkbox"/> Multimedia Requirements Stated (e.g. CD/DVD, Speakers, Mike, etc.)	

		<input type="checkbox"/> Internet speed stated <input type="checkbox"/> Other Requirements Stated (specify: _____) <input type="checkbox"/> Not Stated	
A9	Minimum Software Requirements stated:	<input type="checkbox"/> OS Stated (e.g. windows version) <input type="checkbox"/> Browsers version/type <input type="checkbox"/> Plug-in software stated <input type="checkbox"/> Other software requirements (specify: _____) <input type="checkbox"/> Not stated	
A10	MLM validate by SME	<input type="checkbox"/> Yes <input type="checkbox"/> No	
A11	Warranty	<input type="checkbox"/> Warranty provided <input type="checkbox"/> No Warranty provided	
A12	MLM conformant with prevalent and applicable standards	<input type="checkbox"/> SCORM <input type="checkbox"/> Web 2.0 <input type="checkbox"/> Open source <input type="checkbox"/> Others (not stated)	
A13	Provides support for special needs (i.e., physically challenged)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
A14	License conditions of the MLM stated	<input type="checkbox"/> Copyright protected <input type="checkbox"/> Creative Commons with Attribution <input type="checkbox"/> Creative Commons share Alike <input type="checkbox"/> Creative Commons non Commercial <input type="checkbox"/> Any other <input type="checkbox"/> Not stated	

PART B: ASSESSMENT GUIDE FOR MULTIMEDIA LEARNING MATERIAL

S.NO	QUALITY INDICATORS	SCORE	DESCRIPTION
B1	Learning objectives (LO) are clearly stated (*)	1	Primary LO not stated
		2	Primary LO stated
		3	Primary LO is clearly stated, but sub/secondary LO (SLO) are not stated
		4	Primary LO and Secondary LO are stated
		5	Primary LO and Secondary LO are very clearly stated
B2	Language is appropriate to target 1 audience (*)	1	Totally not understandable (i.e. Too high level, too many mistakes )
		2	Inappropriate (High level, complex, some mistakes)
		3	Appropriate (Average level of difficulty and complexity, minor mistakes)
		4	Good (simple and clear)
		5	Excellent (simple, very clear and engaging)
B3	Pre-Requisites stated	1	Not stated
		2	Stated but not clear
		3	Stated and clear but not adequate.
		4	Stated clearly and adequately

		5	Stated clearly, adequately and checked (pre-tested)
B4	Content is accurate and factual (*)	1	Lots of mistakes and inaccuracies
		2	Some mistakes and inaccuracies
		3	Accurate and correct
		4	Accurate, correct and appropriate to the target audience
		5	Accurate, correct, appropriate and enriched
B5	Content Meets Objectives (*)	1	Not structured
		2	Semi-structured
		3	Fairly well structured
		4	Well structured
		5	Very well structured and provides site map
B6	Content is structured	1	Not structured
		2	Semi-structured
		3	Fairly well structured
		4	Well structured
		5	Very well structured and provides site map
B7	Scope of the content is sufficient	1	Totally insufficient.
		2	Partially sufficient
		3	Meets minimum requirements
		4	More than sufficient
		5	More than sufficient and is supplemented with additional activities
B8	Clear instructions are available on how to use the content (*)	1	No instructions available (i.e. very difficult to use)
		2	Some instructions available
		3	Most instructions available
		4	All necessary instructions available
		5	All necessary instructions available with additional help tools
B9	Content is easy to understand (*)	1	Content difficult to understand
		2	Some parts of content difficult to understand
		3	Most parts of content easy to understand
		4	Content easy to understand
		5	Content easy to understand and innovative approaches used to explain content
B10	MLM is interactive (*)	1	No interactivity provided
		2	Limited interactivity provided
		3	Fair amount of interactivity provided
		4	Interactivity is adequate and engaging
		5	Many interesting and innovative forms of interactivity provided (e.g. Simulation and game-based learning etc.)
B11	Different learning styles are addressed	1	No specific learning style addressed.
		2	Only one learning style addressed.
		3	Few different learning styles addressed.
		4	Few different learning approaches are used
		5	Many different learning approaches are used.
B12	The use of media is appropriate 1 (*)	1	Choice of media is poor
		2	Choice of media is appropriate
		3	Choice and combination of media is

			appropriate
		4	Choice and combination of media is appropriate and engaging
		5	Choice and combination of media is appropriate, engaging, and is consonant with learning objectives
B13	The interface is user-friendly (*)	1	Interface is not user-friendly (i.e. user need to use manual extensively or require many hours of training)
		2	Some parts of interface are user-friendly
		3	Many parts of interface are user-friendly
		4	Interface is user-friendly and visually appealing
		5	Interface is very user-friendly, visually appealing and has a 'wow' element
B14	The MLM is sensitive to gender and Socio-cultural factors. (*)	1	MLM does not reflect sensitivity
		2	MLM reflects sensitivity to some extent
		3	MLM reflects sensitivity
		4	MLM reflects sensitivity and supportive of gender equality and socio-economic considerations
		5	MLM is sensitive, supports and advocates gender equality and socio-economic considerations
B15	Use of fonts and colour are appropriate.	1	Fonts are not legible.
		2	Fonts are legible but not visually appealing
		3	Fonts are legible and colour and style are learner appropriate
		4	Font size and colour communicate information hierarchy and are learner appropriate
		5	Fonts and colour are learner appropriate and creatively used
B16	Learner Assessment is included in the MLM	1	Assessment is not included
		2	Assessment covers only some of the learning outcomes
		3	Assessment covers all learning outcomes.
		4	Assessment covers all learning outcomes with feedback
		5	Innovative techniques of Assessment used covering all learning outcomes with remedial feedback.
B17	Promotes collaborative learning	1	Promotes only individual learning
		2	Provides scope for limited interaction with peer and/or instructor.
		3	Provides adequate scope for interaction with peer /instructor.
		4	Provides scope for group activities
		5	Many group activities are provided for with opportunity for knowledge construction.
B18	Learning support is available	1	Learning support is not available
		2	Limited online and/or off-line learning support is available
		3	Learning support is available with good response time



		4	Prompt learning support is available through various modes during working hours.
		5	24 × 7 learning support is available through various modes
B19	Overall how do you rate the MLM ?	1	Poor
		2	Average
		3	Good
		4	Very good
		5	Excellent

#### 4. Conclusion

Generally, the framework is able to serve as a reliable tool to assess multi-media learning materials or at least can assist users to get general ideas about the quality of a MLM. Even though no weight has been given but the quality indicators are divided into two main categories that are critical indicators, which are marked as \* and the rest is considered as desirable indicators. A MLM is considered having quality if the critical indicators are rated above average. As for the desirable indicators, the greater the rating means the better the quality of the MLM. Nevertheless, the framework is not conclusive, it is ready to receive suggestions for further improvement.

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