

# ASSESSING E-LEARNING MATURITY @ UNIVERSITY OF MAURITIUS USING EMM V2.3 AS A BENCHMARK

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## Abstract

The e-Learning initiative at the University was launched in 2001 with the setting up of the Virtual Centre for Innovative Learning Technologies. Fifteen years later, the initiative has attained a level of maturity where 4 programmes of studies are offered on a mainly online mode of delivery. The Centre has developed capabilities over time in the area of content development, instructional design, educational technology, and online course delivery and support through which the University of Mauritius has been able to deliver fully online programmes. Quality assurance is an important component when it comes to the credibility and perceived value of online courses, and in this context the Victoria University of Wellington has developed the e-Learning Maturity model, by which institutions 'can assess and compare their capability to sustainably develop, deploy and support e-learning'. The model consists of five key areas of assessment, namely Learning, Development, Support, Evaluation and Organisation. This work essentially aims to benchmark the eLearning practices at the University of Mauritius with version 2.3 of the eMM. It will help us identify gaps and address issues inherent within our current operational model to improve our existing processes and quality delivery of online courses.

## Introduction

eLearning is described as a method of delivering information through a web-based platform via the internet. Many organizations namely training centres, private institutions and universities have fostered e-learning as a mode of teaching to complement the traditional class-room model or as a collaborative tool. With the improvement of ICT infrastructure in Mauritius, technology is rapidly enhancing online learning to create a digital island. This has led to a dramatic increase in the use of e-learning platforms to deliver education in the country. According to the statistics in the National ICT Strategic plan (NICTSP) of 2007-2011, Mauritius has an Internet penetration ratio of 29.6 % with 380,000 internet users. Moreover, based on the Global Information Technology Report of 2008-2009, Mauritius is ranked 51<sup>st</sup> on the network readiness index. Based on the Tertiary Education 2009 report (June 2009), it can be noted that 12% of tertiary students representing 10,141 students, study on Distance Education (DE). Investment in e-learning by educational institutions has grown rapidly, driven in part by the expectation that increased use of technology, will improve the quality and flexibility of learning. Hence, the e-learning technologies can improve the distant mode of access to education and the training capacity. Web-based learning also presents panoply of advantages which can help make Mauritius a knowledge hub.

The e-learning initiative at the University of Mauritius dates back to 2001 when the Virtual Centre for Innovative Learning Technologies was established to promote the use of ICT in teaching and learning and to modernize the distance education concept through the provision of high-quality online learning courses. In 2004, the first online programme of studies targeting educators was launched. It was a Masters programme in Computer-Mediated Communication and Pedagogies, and as date there are currently four online programmes in the field of ICTs and Education Technologies. The e-learning initiative has therefore experienced continuous growth both for off-campus courses, and the delivery of stand-alone online modules within the on-campus courses. The e-learning initiative at the University of Mauritius has focused on three key aspects of quality assurance namely teaching and learning, i.e curriculum and content development including student support), technology and infrastructure, and policy making (Santally 2013).

In 2015, the e-learning initiative furthered its expansion to reach out the region through the signature of a memorandum of understanding with the Global e-Schools and Communities Initiative (GESCI) to offer the online African Leadership in ICT programme to the African region. It has also partnered with the Commonwealth of Learning to run as from 2016, a number of online stand-alone modules to participants from the Commonwealth region in the context of the COL's Virtual University for the

Small States of the Commonwealth (VUSSC) programme. While all the online programmes of the University are subject to the same rules and regulations as traditional courses, as well as the rigorous processes of quality assurance that are in place, there is a growing need to align the initiative with international benchmark and practices in the areas of online education. The aim of the study presented in this paper is to use E-learning Maturity Model (eMM) v2.3 to assist the institution in benchmarking its current e-learning capabilities. The eMM is a quality framework designed to help instructional leaders to evaluate and improve e-learning maturity of an organisation. The model measures the capability, to analyse and improve the organisational maturity. Institutions that have greater organisation maturity in e-learning are described as having greater capability thus, ensuring that the e-learning design meets the need of the staff, students and the institution.

## Literature Review

The Internet has witnessed an exponential growth in the last decade and the modernization of global ICT Infrastructures have led to an acceleration of the move towards the knowledge society especially for developing countries. Education and ICT are two key pillars of the knowledge society and ICTs have brought a transformation of the education landscape with the growing influence of online education and e-learning programmes (GESCI 2012). E-learning is a form of educational delivery that has become quite prominent in universities worldwide and an activity that, to all intents and purposes, can now be considered mainstream (Oliver 2005). There has been a growing interest from stakeholders, ranging from researchers to education providers including governments and policy makers to the implications and concerns of e-learning and online education. Such concerns are mainly related to the perceived lack of quality standards for e-learning (Oliver 2005). While this is a genuine concern to some extent, there are however, a number of quality assurance guidelines and models with respect to quality provisions of online education (QAA 1999; Barker 2002; JISC 2004:2009; Marshall 2006). Furthermore, Grifoll et al. (2010) argue that “quality assurance policies need to formulate questions on how far e-learning methods are included in all study programmes, and on the adequacy between new technologies and the emerging new educational approaches, taking into consideration concepts such as efficiency in teaching, effectiveness in learning or equity in education”.

Guidelines for quality e-learning provision existed quite some time ago. For example Barker (2002) published the Canadian Recommended e-Learning Guidelines (CanREGs), covering aspects such as quality outcomes, quality processes and practices, delivery and management of learning, quality inputs and resources for e-learning products and services. Oliver (2005) highlights that there have been attempts to develop quality frameworks or model for quality assurance in e-learning. The four key elements of such frameworks can be categorized as per Oliver (2005) in four broad elements namely the curriculum, the learning design, the learning resources, and the delivery processes. Huertas et al (2010) discussed the assessment of e-learning institutions using a methodology developed by the Quality Assurance Agency of Catalunya and which was tested over a period of two years. Zhang and Cheng (2012) used the PDPP (planning evaluation, development evaluation, process evaluation, and product evaluation) evaluation model for e-learning courses and applied it to a course on research methods. They identified 26 evaluation items with respect to the PDPP model for online courses quality assurance. The eLearning Maturity Model (eMM) is based on the concept of Software Capability Maturity Model (CMM) and SPICE (Software Process Improvement and Capability dEtermination). The model has been conceived by Stephen Marshall in 2003 and has undergone a number of improvements. The current version in use of the eMM is version 2.3. The eLearning Maturity Models assesses the institution’s ability in five main ‘process’ areas: Learning, Development, Support, Evaluation and Organisation.

It is referred to as “a quality improvement framework designed to support educational institutions interested in improving their organizational capability to use technology in learning and teaching in a complex and changing environment” (Marshall 2013). The eLearning Maturity Model has been applied to a number of Australian institutions since its conception and is continually being evaluated and improved. The framework proposed by the eLearning Maturity Model is appropriate for the benchmarking of the eLearning initiative of the University as it covers the key areas that we are engaged into. For each of the process areas as defined above, there are five process dimensions for which the specific process statements (within process areas) will be assessed. The five process dimensions are delivery, planning, definition, management, and optimization. This evaluation and benchmarking of the university in terms of its e-learning capability will be used mainly for the

improvement of the institutional practices through the identification of weaknesses and gaps, and in line with the new strategic plan 2015-2020 of the institution.

## Methodology

The research questions of this research are

- What is the effectiveness of the e-learning initiative at the CILL with respect to the Five Process Areas and the Dimension capability of the Learning Process Area of the eMM v 2.3?
- What are strengths and weaknesses of the CILL with respect to the Learning Process Area of eMM v2.3?
- What steps and actions have to be taken to improve the maturity level of the CILL with respect to the Learning Process Area?

The eMM has implemented the concept of dimensions to outline the capability in each of the process (figure 1). The five dimensions namely delivery, planning, definition, management and optimisation describe the process capability in a simple way.

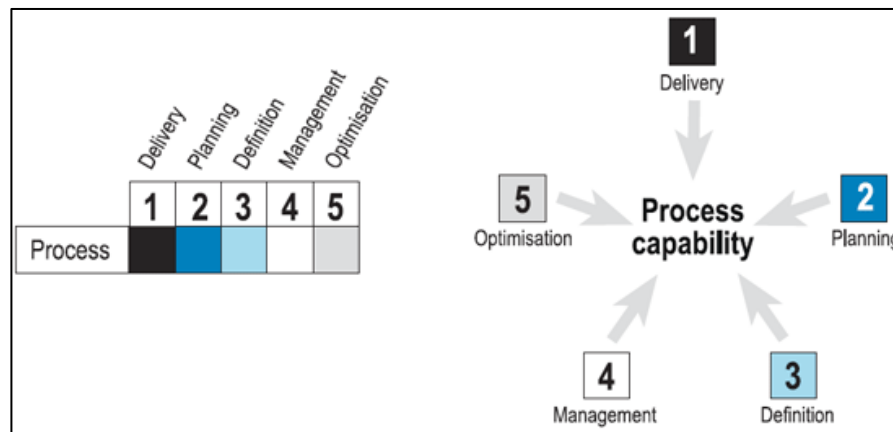


Figure 1: eMM Process Dimensions

The delivery dimension encloses the creation and provision for process outcomes. The aim of this dimension is to assess performance of the process within the institution. The planning dimension examines the use of an established objective and plan while performing the work of the process. Once the plan is defined, the process is more manageable and can eventually be reproduced upon success. The definition dimension deals with the use of standard documents, guidelines and policies of the institutions during the implementation process. An organisation functioning effectively within this dimension has properly defined the performance of the given process. The management dimension is the test carried out to understand how an institution manages the implementation process and guarantees the quality outcomes. The capability of this dimension shows how the process outcomes are measured and controlled. The optimization dimension examines the extent to which the organization is using a structured approach to improve the activities of the process to achieve pre-defined objectives. The capability of this dimension indicates a series of continuous improvement.

The latest version of the eMM provides a set of five major processes namely learning, development, support, evaluation and organisation (Table 1). The processes have thirty-five sub processes defining the capability of institutions to extend and perform well in the delivery of e-learning. Moreover, all of the processes have been created after a program of research and testing, conducted internationally. For the purpose of the study, only one process has been selected and evaluated namely the learning process. This process has ten sub-processes selected on the basis of its necessity in the development and maintenance to achieve the learning process outcome of an institution (Table 2).

<b>Process Category</b>	<b>Brief Description</b>
Learning	Processes that directly impact on pedagogical aspects of e-learning
Development	Processes surrounding the creation and maintenance of e-learning resources
Support	Processes surrounding the oversight and management of e-learning
Evaluation	Processes surrounding the evaluation and quality control of e-learning through its entire lifecycle.
Organisation	Processes associated with institutional planning and management

*Table 1: eMM version 2.3, process categories (revised from Marshall and Mitchell, 2003)*

The ten processes of the learning process area are as followed:

L1	Learning objectives guide the design and implementation of courses.
L2	Students are provided with mechanisms for interaction with teaching staff and other students.
L3	Students are provided with e-learning skill development.
L4	Students are provided with expected staff response times to student communications.
L5	Students receive feedback on their performance within courses.
L6	Students are provided with support in developing research and information literacy skills.
L7	Learning designs and activities actively engage students.
L8	Assessment is designed to progressively build student competence.
L9	Student work is subject to specified timetables and deadlines.
L10	Courses are designed to support diverse learning styles and learner capabilities.

*Table 2 : eMM version 2.3, processes within the Learning Process Area (revised from Marshall and Mitchell, 2003)*

A case-study approach is suitable for this type of research, as the subject under study is a specialised unit being examined in a real-life context. Triangulation is a powerful technique employing a combination of several research methods and two or more data sources. According to O'Donoghue and Punch (2003), triangulation is a "method of cross-checking data from multiple sources to search for regularities in the research data." So, the main aim of triangulation is to facilitate reliability and validation of the information collected and the findings drawn.

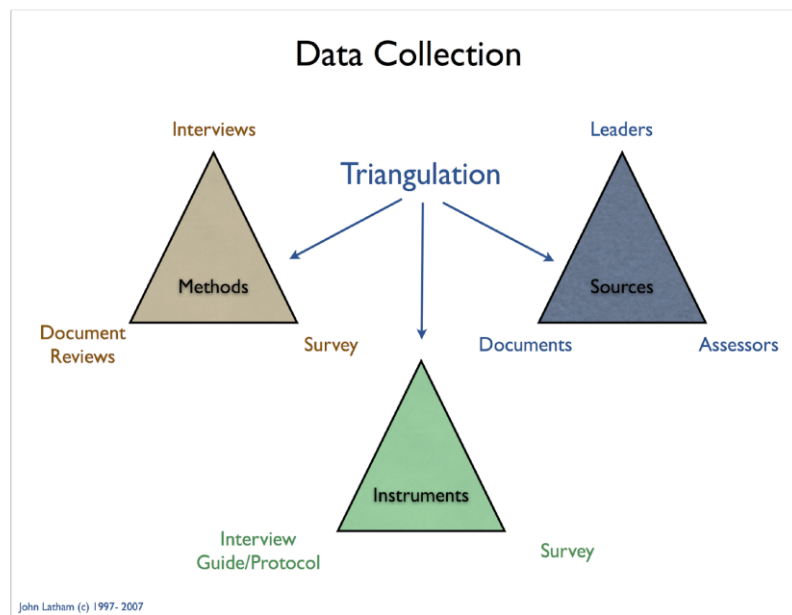


Figure 2: John Latham’s data collection plan using triangulation (<http://johnlatham.me/wp-content/uploads/2013/12/Triangulation.png>)

Information using different types of sources can be used to complement one another and eventually increase the credibility of the research work. The target sample population for the purpose of this study is a triangulation of resource persons at CILL to estimate characteristics of the whole institution. The triangulation consist namely of the students, the technical staff and the academic. They were selected as being representative of the low, medium and high attainment groups within the organisation. For this case study, a mix of quantitative and qualitative data gathering strategies such as structured-question interviews, surveys, and documents were used.

Nevertheless, there are some weaknesses and limitations in this study that may affect the final results. The research is very time-consuming especially the different set of online surveys and due to the time constraint of research and the broad scope it is concerned with, issues mentioned are still somewhat general. Moreover, the implementation of this research in real-life processes is not a continuous uniform process. The view of respondents may be affected by external events, such as technical problems that may hinder the evaluation process. Furthermore, the results can be biased as respondents can be reluctant to give their true opinions when filling online questionnaires and during the interview.

## Analysis and Discussion

The results of the research were based mainly on the pre-test online assessment surveys, a second evaluative online assessment surveys and an interview. The CILL stands at the crossroad of a new online education generation offering a wide access to e-learning. In the context of implementing the eMM, the occurrence of successful e-learning is defined by comparing the assessments. The following figure illustrates an overview of the triad’s perceptions (students, academic and technical staff) on the five Process Areas and their connected processes.

■ Yes  
 ■ No  
 ■ To some extent  
 ■ Not applicable

Students

Technical staff

Academic staff

<b>Learning: Processes that directly impact on pedagogical aspects of e-learning</b>			
L1	Learning objectives guide the design and implementation of courses		
L2	Students are provided with mechanisms for interaction with teaching staff and other students		
L3	Students are provided with e-learning skill development		
L4	Students are provided with expected staff response times to student communications		
L5	Students receive feedback on their performance within courses		
L6	Students are provided with support in developing research and information literacy skills		
L7	Learning designs and activities actively engage students		
L8	Assessment is designed to progressively build student competence		
L9	Student work is subject to specified timetables and deadlines		
L10	Courses are designed to support diverse learning styles and learner capabilities		
<b>Development: Processes surrounding the creation and maintenance of e-learning resources</b>			
D1	Teaching staff are provided with design and development support when engaging in e-learning		
D2	Course development, design and delivery are guided by e-learning procedures and standards		
D3	An explicit plan links e-learning technology, pedagogy and content used in courses		
D4	Courses are designed to support disabled students		
D5	All elements of the physical e-learning infrastructure are reliable, robust and sufficient		
D6	All elements of the physical e-learning infrastructure are integrated using defined standards		
D7	E-learning resources are designed and managed to maximise reuse		
<b>Support: Processes surrounding the support and operational management of e-learning</b>			
S1	Students are provided with technical assistance when engaging in e-learning		
S2	Students are provided with library facilities when engaging in e-learning		
S3	Student enquiries, questions and complaints are collected and managed formally		
S4	Students are provided with personal and learning support services when engaging in e-learning		
S5	Teaching staff are provided with e-learning pedagogical support and professional development		
S6	Teaching staff are provided with technical support in using digital information created by students		
<b>Evaluation: Processes surrounding the evaluation and quality control of e-learning through its entire lifecycle</b>			
E1	Students are able to provide regular feedback on the quality and effectiveness of their e-learning experience		
E2	Teaching staff are able to provide regular feedback on quality and effectiveness of their e-learning experience		
E3	Regular reviews of the e-learning aspects of courses are conducted		

<b>Organisation: Processes associated with institutional planning and management</b>				
<b>O1</b>	Formal criteria guide the allocation of resources for e-learning design, development and delivery			
<b>O2</b>	Institutional learning and teaching policy and strategy explicitly address e-learning			
<b>O3</b>	E-learning technology decisions are guided by an explicit plan			
<b>O4</b>	Digital information use is guided by an institutional information integrity plan			
<b>O5</b>	E-learning initiatives are guided by explicit development plans			
<b>O6</b>	Students are provided with information on e-learning technologies prior to starting courses			
<b>O7</b>	Students are provided with information on e-learning pedagogies prior to starting courses			
<b>O8</b>	Students are provided with administration information prior to starting courses			
<b>O9</b>	E-learning initiatives are guided by institutional strategies and operational plans			

**Figure 3 : Comparative capability assessment of the five process areas**

Referring to the comparative analysis of the Five Process Areas namely Learning, Development, Support, Evaluation and Organization, it can be concluded that the three sample groups agreed in principle with all the Process Areas and the interrelated processes. Therefore, the CILL can be referred as an effective organization as it adheres successfully with all the five Process Areas of the eMM. Concerning the comparative capability assessment of the Dimensions of the Learning Process Area, it can be concluded that the majority of the respondents agreed with most of the processes with rating indicators of ‘Fully’ and ‘Largely’. It is observed that stronger capability was noticed in the Delivery Dimension and the Optimization Dimension.

Concerning the Delivery Dimension, the ratings show that the institution implements and assesses the performance of the processes. Moreover, the results for the Planning Dimension reveal that the institution provides established objectives and prepares a structured plan for each process. The raters were also agreeable with the fact that the institution has standard documents, guidelines and policies for the implementation of the different activities. Moreover, the Optimization Dimension shows that the organization is using a structured approach so that the activities attain their objectives. The capability of the Management dimension reveals how the process outcomes are measured and controlled for each practice. An organisation functioning effectively within these five dimensions has properly defined the performance of the given process. Therefore, the overall analysis suggests that there are a large number of processes that scored a positive rating so, it is apparent that the CILL has a mature e-learning capability.

## **Conclusion**

The model provides a benchmarking aspect of CILL’s capability and the weak practices that need improvement to satisfy the learners, staff and stakeholders fully and to develop the CILL into a mature e-learning organisation. According to the findings, it can be noticed from the rating indicators of the eMM that the CILL has the key capability standard concerning the e-learning. It also indicates that delivery of face-to-face and online mode of learning, are both of comparable quality. Moreover, evidence of a satisfactory educational framework can be concluded through the report. The students’, lecturers’ and technical staff’s feedbacks were useful to raise some issues concerning the e-learning maturity in the institution. The eMM was used as a Quality Assurance to assess the e-learning maturity of the CILL, with regards to the Learning Process Area. It helps to emphasize the development of standards in e-learning with relevant heuristics to perceive the quality of e-learning at the CILL. As a future work, a similar assessment can be done in the institution through an in-depth evaluation of the other process areas.

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