Implementing e-learning Maturity Model at Al-Quds Open University in Palestine

تطبيق نموذج نضج تجربة التعليم الإلكتروني على جامعة القدس المفتوحة في فلسطين

Islam Younes Amro

Associate Professor\ Al-Quds Open University\ Palestine

iamro@qou.edu

اسلام يونس عمرو

أستاذ مشارك/ جامعة القدس المفتوحة/ فلسطين

Abstract:

Al-Quds Open University (QOU) is one of the leading organizations in the Arab countries in the blended and open learning models. The University has proved its leading role over 30 years of serving Palestine through more than 120 thousand graduates from its programs. The University has played a leading role in Palestine in adapting the e-learning component of the blended model for 14 years. In this research, we worked on implementing the e-learning Maturity Model (eMM) on the electronic component of the blended learning of al-Quds Open University. All the dimensions of the e-learning Maturity Model were considered and visited, and it was found to be applicable in most of its aspects of e-learning at QOU. The dimensions provided by the eMM were covered in this research as delivery, planning management, and optimization. The process followed in dealing with the model aspects was conducted through the standard recommendations of the eMM. The research also discussed the methodology of conducting the eMM process, which depended on partitioning the questionnaire according to the stakeholders within the University. The stakeholders were considered in terms of their functional tasks within their organizational units. The participants then were questioned accordingly, considering the standard questionnaire points. Then the answers were reflected to form the case implantation for al-Quds Open University. Recommendations are made according to the organizational gaps found, and suggestions are made to catch up with the gaps reflected from the eMM. The model implantation reflected extreme organizational issues related to pedagogies, organizational units, documenting core course creations, implementation procedures, tutors, and student support. In addition, the University demonstrated a very reliable, mature e-learning infrastructure and technical capabilities. The main shortcomings were found in issues related to the need to establish stand-alone strategic planning for e-learning and the need to increase procedures documentation and workflows to exceed the core of e-learning processes to cover all aspects of e-learning.

Index Terms: e-Learning, blended learning, e-Learning management, e-Learning maturity model.

:الملخّص

جامعة القدس المفتوحة هي إحدى مؤسسات التعليم العالي الرائدة على مستوى العالم العربي في مجال التعليم المدمج والتعليم المفتوح. وقد أثبتت الجامعة دورها الريادي عير الأعوام الثلاثين الماضية في خدمة الشعب الفلسطيني وذلك من خلال تخريج ما يزيد عن المائة وثلاثين ألف طالب وطالبة من برامجها المختلفة. دأبت الجامعة على تبني نظام التعليم المدمج، وذلك من خلال إدخال نظام التعليم الإلكتروني كمركب أساس في العملية التعليمية. في هذه الورقة، قمنا بتطبيق نموذج قياس نضج التعليم الإلكتروني على الشق الإلكتروني من التعليم المدمج في الجامعة، حيث تم التعامل مع كافة عناصر النموذج المختلفة وتطبيقها على الجوانب ذات العلاقة في الجامعة. تتلخص هذه العناصر في إيصال الخدمات الإلكترونية، ومن ثم تخطيط الخدمات، ومن ثم إدارة الخدمات وصولاً إلى مرحلة ضبط الأداء. تم اتباع التوصيات الخاصة في نموذج القياس المعتمد، وذلك من خلال التعامل مع الاستبانات المرتبطة ببنود النموذج. تم توزيع الاستبانات بحسب دوائر الاختصاص في الجامعة مع إيضاح الهيكليات الإدارية والأكاديمية والطلابية في الجامعة المرتبطة بموضوع النموذج، كما وتم التعامل مع تعبئة هذه الاستبانات من خلال مقابلات مع الهيكليات ذات العلاقة. حيث عكست الإجابات على هذه الاستبانات الصورة العامة لمدى نضج تجربة الجامعة في مجال التعليم الإلكتروني. أظهر تطبيق النموذج نقاط قوة متعددة لتجربة التعليم الإلكتروني في الجامعة تتركز حول وجود العديد من الإمكانات في الجامعة الفنية منها والأكاديمية، تتمحور نقاط القوة حول الجانب التربوي والفني وأنظمة إدارة المحتوى، ووجود لوائح تنظيمية للعمل الأكاديمي المستند على التعليم الإلكتروني إلى جانب نقاط أخرى. تركزت نقاط الضعف حول عدم وجود استراتيجيات منفصلة للتعليم الإلكتروني تركز على تعزيز إمكانات وفرص التعليم الإلكتروني، إلى جانب الحاجة إلى توثيق الإجراءات الإدارية الناظمة لجوانب التعليم الإلكتروني المختلفة، وذلك للعمل على تطوير التعليم الإلكتروني ضمن منهجية مخصصة لهذا الشأن.

الكلمات المفتاحية: تعليم إلكتروني، تعليم مدمج، إدارة التعليم الإلكتروني، نموذج نضج التعليم الإلكتروني.

1. Introduction

The COVID-19 pandemic has played an essential role in mainstreaming e-Learning. It could show the world how necessary it is to move towards e-Learning on larger scales and more effective measures. Although previous worldwide efforts were conducted in the pursuit of e-Learning during the last 20 years, this could not boost e-Learning effectively as the pandemic boosted it. The concept of e-Learning is being approached according to several prospects, some technical, some educational, and many other aspects. However, there is a need to evaluate and guide the process of e-Learning evolution through methodologic approaches that cover the necessary components of e-learning, including academics, administrative, students, technical, and organizational aspects. Thus, boosting the ideas that exceed the technological dimension that seem to dominate other aspects to throw light on more important aspects found for the actual technological needs. In this research, we exploit a widely accepted model that evaluates the maturity

of e-Learning. Maturity is achieved after covering several important aspects vertically and horizontally on the organizational level. We worked in the following sections to cover the necessary information about the model and how to understand the aspects covered and levels to achieve maturity. Then we implemented on al-Quds Open University and finalized the paper with recommendations.

1.1 The concept of maturity models

Maturity may be described as the condition, fact, or maturity period (Oxford Dictionaries 2021). MMs are recognized as instruments to demonstrate the progressive, methodical growth or improvement of the overall abilities, processes, structures, or circumstances of an organization, the concept of maturity models service, the need for contentious evolution of developing systems. The idea has emerged within the information technology sector and then marshaled to other sectors like education, governance, and business processes. The known reference for the software maturity models is gathered within a group called Software Process Improvement and Capability Determination (SPICE) (SPICE 2018). The initial standards were defined on the maturity models' issue, which was defined in ISO/IEC 15504, as this standard has been replaced by ISO/IEC TS 33061:2021 (ISO 2021).

The notion of the maturity model of ability (CMM) was first introduced formally in (Paulk et al., 1993). Rather than the major revolutionary discoveries, recognizing a continual development of processes is based on numerous incremental, evolutionary stages. The model offers a framework for the organization in five maturity levels of these evolutionary phases, which establish the basis for continual progress. This approach is the core of most management systems and is meant to enhance the quality of product creation and delivery.

Spice and ISO maturity models are broken down into 5 tiers. The five maturity levels define a scale to measure the maturity an organization's software process and assess its capacities. It also helps an organization to prioritize its efforts to enhance it. A maturity level is a well-defined developmental platform for a mature software process. Each stage of maturity includes a set of process goals that stabilize an essential part of the process when fulfilled. Achieving the maturity framework at each stage provides a distinct component in the software process, increasing the organization's process capacity.

The five maturity stages of the software capacity were defined as initial, repeatable, defined, managed, and optimized. Initial indicates that the software process is ad-hoc and sometimes chaotic. In contrast, repeatable indicates that fundamental cost, scheduling, and functionality management methods are defined. To recur previous achievements on projects with comparable applications, the required process discipline is in place. Defined indicates that the software process is documented, standardized, and integrated into all organizational processes for both management and technical operations. Detailed software and product quality measurements are taken. Managed includes both software and goods, which are understood and managed quantitatively. Optimization is eventually the quantitative input from this approach; novel ideas and technology piloting will enable continuous process improvement. These five concepts of maturity are exploited and developed to identify the maturity models used in education, governance (Andersen 2008), business (Tarhana et al., 2016), and many other sectors.

level 1: Initial
• indicates that the software process is ad hoc and sometimes chaotic

level 2: Repeatable
• indicates that fundamental cost, scheduling and functionality management methods are defined

level 3: Defined
• indicates that the software process is documented, standardized, and integrated into all organizational processes for both management and technical operations

Level 4: Managed
• indicates that the software features is measured such as its size, reliability, time complexity, understandability, etc.

Level 5: Optimizing
• indicated that the process and software measurement data are evaluated for continuous process improvement.

Figure 1:

maturity stages of software capacity

The e-Learning Maturity Model Aspects

Capability evaluation is a complicated subject as e-learning. It is tough because it necessitates condensing vast quantities of detail into a wider perspective that helps management decision-making and strategic planning. This technique will always fail to identify the subtle subtleties and inventive work of people that drive instructional staff to work on specific projects. Institutions and people will always have the option of investing time and other resources in creative, one-of-a-kind possibilities. The eMM's focus is on a less lofty goal as improving organizational circumstances so that e-learning is given to as many students as possible in a sustainable and high-quality manner.

This analysis framework is based on the Capability Maturity Model (CMM, Paulk et al., 1993) and SPICE Software Process Improvement and Capability determination, el-Emam et al., 1998; SPICE, 2002). The fundamental notion is that an institution's ability to be productive in a certain area of work relies on its ability to participate in high-quality processes that are repeatable and can be sustained and improved upon. An organization's qualities that enable high-quality procedures can be isolated to some extent from the specifics of the job done, which will change depending on the circumstances. Because of this separation, the analysis may be conducted independently of the technology and pedagogies used, thus allowing for meaningful comparison. In the context of this paradigm, capability refers to an institution's capacity to guarantee that e-learning design, development, and implementation satisfy the needs of students, staff, and the institution. Capability includes an institution's ability to maintain e-learning support for teaching as demand rises and staff changes.

The eMM, which is based on the SPICE model, separates institutions' capacity to sustain and provide e-learning into five key categories or process areas (Table 1). The inclusion of the learning area, which substitutes the Customer/Supplier area utilized in software engineering, is the main variation from the original SPICE paradigm. Processes describe an aspect of an institution's overall capacity to perform well in the given process area and hence in e-learning in general. The benefit of this method is that it divides a complicated area of institutional activity into linked areas that may be evaluated separately and presented in a fairly simple overview without sacrificing information.

Table 1:

eMM process categories (revised from Marshall, 2007)

Process category	Brief description
Learning	Processes that directly impact pedagogical aspects of e-learning
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
Organization	Processes associated with institutional planning and management

One apparent need of this approach is that the processes are chosen to be empirically supported and, in a way, convey "common facts" regarding e-learning capability. Are there common practices or methods of developing e-learning materials and learning environments that are acceptable, helpful, and can be articulated in such a manner that others may adopt them and increase their e-learning capability?

The procedures in version one of the eMM were based on the Seven Principles of Chickering and Gamson (1987) as defined in Marshall and Mitchell (2007). These have the advantage of being widely accepted as guidelines or benchmarks for e-learning delivery (Sherry, 2003). However, extensive feedback from workshops and collaborators in New Zealand, Australia, and the United Kingdom and the experience of applying the first version of the eMM identified several additional aspects of capability that required assessment (Marshall, 2006), and this hampered implementation.

1.2 DIMENSIONS OF CAPABILITY

The examination of the initial version of the eMM revealed that the notion of levels employed was ineffective (Marshall 2007). The usage of levels suggests a hierarchical paradigm in which competence is measured and built in layers. In contrast, the primary notion underpinning the dimension concept is comprehensive capacity. Rather than monitoring progressive levels, the model portrays a process's capabilities from synergistic viewpoints. A company that has built capacity across all dimensions for all processes will be more capable than one that has not.

Capability at higher dimensions that is not supported by capability at lower dimensions will not deliver the desired outcomes. Capability at lower dimensions that is not supported by capability at higher dimensions will be ad hoc, unsustainable, and unresponsive to changing organizational and learner needs.

It is useful to evaluate the dimensions in the order shown in Figure 1 below when considering their

relationship. The matrix of boxes used to represent capabilities on the left is useful for comparisons, but it might imply a hierarchical connection that can be deceptive for evaluating findings.
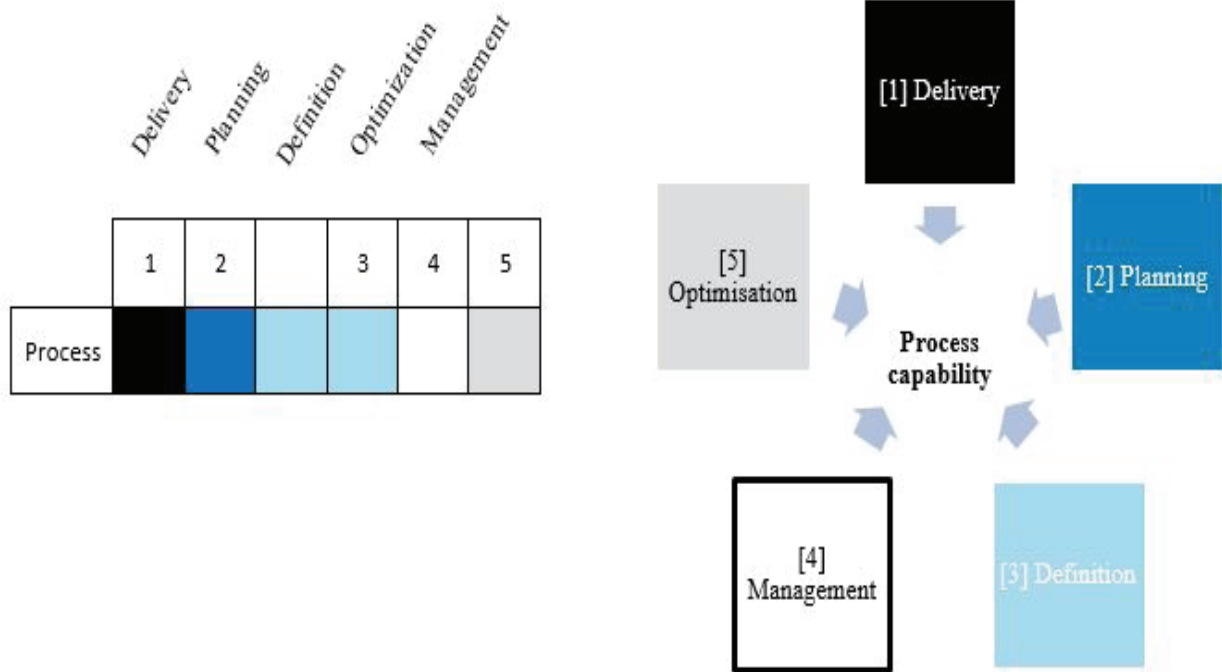

Figure 2:
eMM Process Dimensions (revised from Marshall, 2007)

● Dimension 1 (Delivery) is involved with the development and delivery of process results. This dimension is assessed to determine the extent to which the process is seen to work inside the institution. It is critical to emphasize that institutions can have highly effective procedures working within this dimension. However, in the absence of competence in other dimensions, there is a danger of failure or unsustainable delivery and the waste of resources due to unnecessary duplication.

● Dimension 2 (Planning) evaluates the usage of established objectives and strategies in carrying out process activities. The use of established plans may improve the ability of process results to be managed successfully and replicated if successful.

● Dimension 3 (Definition) During process implementation, the usage of institutionally established and documented standards, guidelines, templates, and policies is covered. An institution that is successful in this area has specified how a particular procedure should be carried out. This does not imply that the institution's personnel follow this advice.

● Dimension 4 (Management) is concerned with how the institution controls process execution and guarantees the quality of the results Capability in this dimension shows the amount of

measurement and control of the outputs and how the institution's employees carry out the process practices.

● Dimension 5 (Optimization) reflects the amount to which an institution uses formal ways to develop competence as evaluated by the other aspects of this process. This dimension's capability shows a culture of continual improvement.

Note that the comprehensive process documentation and a full example are available in Marshall's (2007) resources.

1.3 E-LEARNING MATURITY MODEL PRACTICES

Within each dimension, each process is further subdivided into practices that are either necessary (mentioned in bold type) or merely beneficial (listed in plain text) in attaining the specific process's results from that dimension's perspective. These practices are designed to encapsulate the process's main essences into a collection of items that may be easily assessed in a specific institutional environment. The practices are meant to be general enough to represent the usage of various pedagogies, technology, and organizational cultures. The eMM is intended to analyze the quality of processes rather than to promote specific techniques. The utilization of these thorough lists of practices allows the fundamental components of the eMM

processes to be made explicit, which can then be utilized to build action plans and strategies targeting specific areas of weakness or potential for a sector or institution. They are also necessary for facilitating self-evaluations, as outlined in Marshall (2006).

Each process description contains examples of practice performance in addition to the practice assertions (Figure 2). These exemplars are intended to aid the evaluation process by demonstrating capability performance.

It is critical to emphasize that several different methods of proving competence exist, and the assessor's expertise and judgment should always take precedence. The purpose of providing sample statements is to eliminate any possible ambiguity that may come from the practice statement's language.

Figure 3:

eMM Capability Assessment Practices and Exemplars (revised from Marshall 2007)

When performing an assessment, each practice is assessed for performance from 'not adequate' to 'fully acceptable' using the exemplars (Figure 4). The scores for each dimension are based on data gathered from the institution. They are a combination of whether or not the activity is performed, how well it appears to be operating, and how widespread it appears to be.

Figure 4:

eMM Capability Assessments (based on Marshall, 2007)

A grade of "Not Adequate" implies that there is presently no evidence of the practice occurring in the institutional environment, nor is the practice outcome generally recognized in routine institutional operations. It implies that the institution should explicitly recognize the practice results and allocate accountability for their attainment.

A grade of "Partially Adequate" implies that there are significant flaws or limits in practice outcomes. This is most frequently caused by a failure to officially allocate responsibility for their accomplishment, or by employing outmoded or face-to-face methods in the context of e-learning.

A grade of "Largely Adequate" implies that the practice outcomes are being met but that more formalization is required to guarantee sustainability or that a more systematic examination of activities is necessary. This might happen because of an outdated first generation of e-learning systems or a lack of regular reexamination and maintenance.

A grade of "Fully Adequate" implies that the process outcomes are presently being addressed and accomplished clearly and sustainably. However, this is not a justification for complacency because the rapid rate of change in e-learning needs constant emphasis and investment in all areas. It suggests, however, that

6

in the short future, additional resources or investments can be used elsewhere.

Practices have been designed deliberately to minimize the differences in the determination of capabilities; it is also important to note which evidence underpins the assessment since this provides an insight into and a starting point for considering the improvement in how capacities can be achieved in different contexts.

1.4 EXPLOITATION OF MATURITY MODEL IN E-LEARNING

The e-Learning maturity model has played a key role in catalyzing the process of evaluating e-Learning for several organizations (Marshal 2012). The model itself was exploited in the evolution of e-Learning within several organizations that use e-Learning as a part of blended learning or fully electronic university (Aburawi et al., 2020). The model itself has been a starting point for several modifications and models evolved to serve certain purposes, like in the work of Ingacio et al. (2021) that serves to specify work relating to the evaluation of the maturity of virtual education. The model suggested in this work was organizational-specific and was built according to specific organization experience. In other organizations, the model is used in evaluating teaching and learning in a specific discipline such as medicine (Dhir et al., 2017). It is also feasible to integrate the points of the eMM in building an educational quality assurance (Marshall 2010).

In addition to quality, Marshall (2016) suggested an interesting article; this article describes a quality notion defined by meaning. It investigates the possible insights and direction it may give leaders and others who want a model that aligns quality with future organizational development and reflects complicated interactions between educational organizations and their many stakes. While in Blanco et al. (2014), study suggests using a model-based approach in accreditation, evaluation, and assessment of academic programs. The article aims to evaluate how high-quality practices in higher education are internationalized.

The study provides a model-based strategy that exploits eMM for building value for higher education in view of a lack of theorization concerning quality in the global dimension, design/methodology/approaches. The same eMM philosophy is used in building an

e-Learning risk model as in the work of Hijazi et al. (2019). This study presents an e-Learning project quality assurance system. This framework includes a proactive approach to risk management that

incorporates risk management with e-learning.

This integration helps achieve high-quality e-learning courses to avoid the materialization of unfavorable e-learning hazards. While Maturity models serve advanced issues within organizations and enterprises (Santos 2020), organizations still face several difficulties related to organizational issues. It discusses, in particular, how online and remote learning may be utilized as a catalyst to transform the pedagogical paradigm of institutions and how this might affect new rules and guidelines (Casanova et al., 2018). On the other hand, the eMM model notations and questioning points were exploited in the engineering usability concept of course design, and interfacing design (Lacerda et al., 2018) since Neuhauser (2004) suggested that the exploitation of eMM within an organization catalyzes the process of course creation.

Another work was done by Iskandar (2012) on further revising the dimensions of maturity models. The research aims to examine and comprehend the E-learning Maturity Model dimensions to address this issue (ELMM). A qualitative approach is an inductive approach. The work of Esteban (2021) focuses solely on higher education in universities. For that reason, we offer a new technique to identify the gaps in the existing university maturity models, as they are not fully dimensional models, to identify the models and their validity, and to classify the models discovered in universities. Another variation of eMM can be traced in the work of Rogerio et al. (2015), a quality model based on an approach to continuous process improvement for educational solutions online. The model examines three maturity stages and six joint entities that address the procedures for designing and developing digital educational solutions, intending to achieve standards of qualities that meet their users, for example, students, instructors, and tutors.

1.5 E-LEARNING WITHIN QOU

This section revises a comprehensive model for open distance learning (ODL) content development and media production. This model has evolved by al-Quds Open University (QOU), managed strategically from the academic affairs and conducted through main supporting centers, which are the Information and Communication Technology Center (ICTC), the Open Learning Center (OLC), Media Production Center (MPC) and al-Quds Education Channel. Each center runs very specific tasks since all the focal points of these centers are uniquely identified. ICTC is a pure technology-focused center with a software engineering and infrastructure focus. OLC is an

educational technology-focused where instructional design and pedagogy are being developed and followed up. MPC is a professional Media production entity that serves educational content filming and producing media materials on market standards on the local and regional level. Al-Quds Educational Satellite is the first educational television in Palestine, which serves universities, schools, communities, and lifelong purposes. The television started its broadcasting in April 2016. In addition, it provided several services to the educational communities of Palestine. In the following, we discuss the QOU Model technical components: the academic portal, Moodle cluster, the Digital repository content, the video-sharing platform, and the massive slide-sharing platform. Finally, the QOU satellite channel. Then we present the QOU e-Learning service models. In both content development and service providing scenarios. The key technical components are presented in Figure 5.
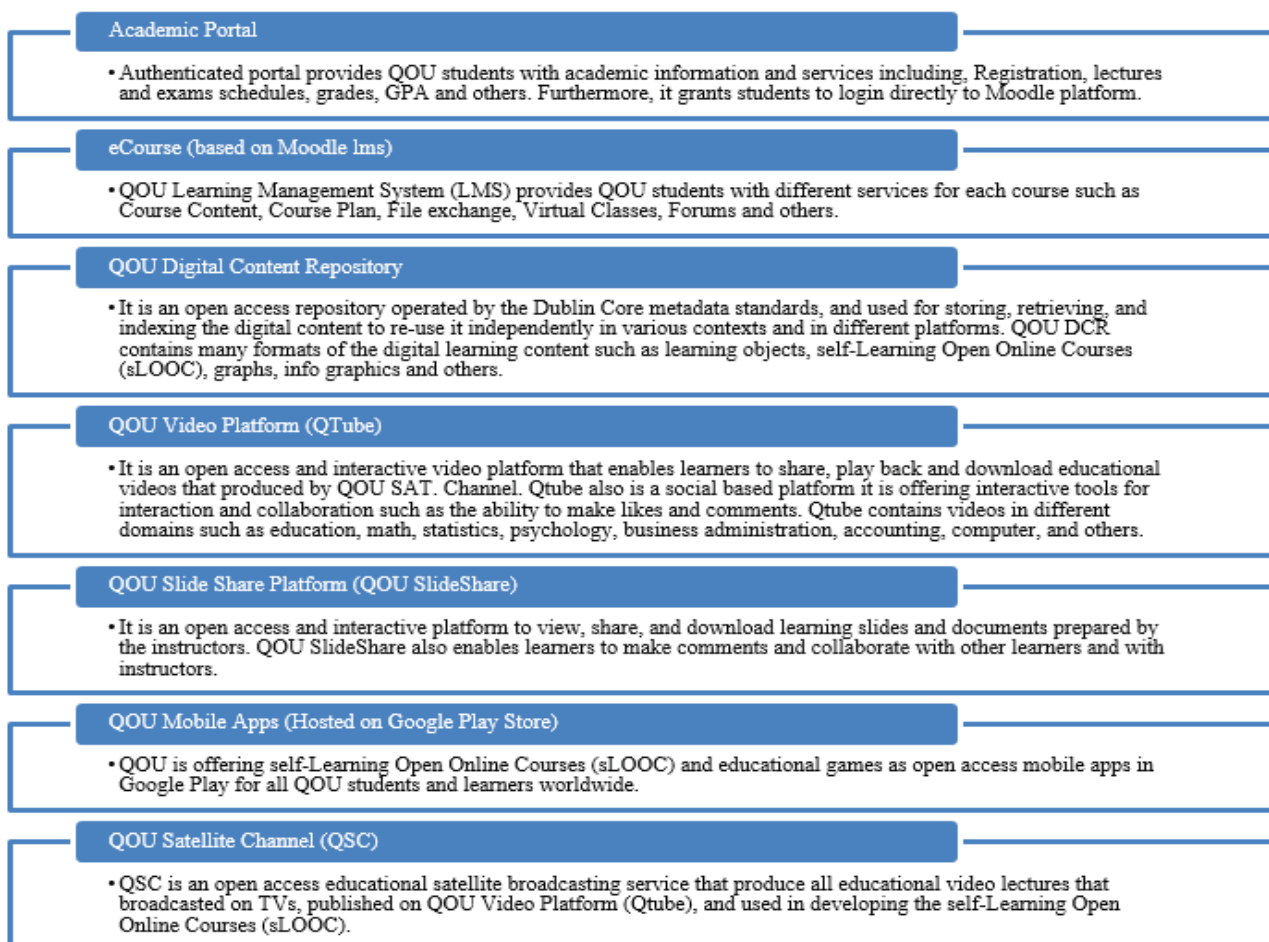
Academic Portal
- Authenticated portal provides QOU students with academic information and services including, Registration, lectures and exams schedules, grades, GPA and others. Furthermore, it grants students to login directly to Moodle platform.

eCourse (based on Moodle lms)
- QOU Learning Management System (LMS) provides QOU students with different services for each course such as Course Content, Course Plan, File exchange, Virtual Classes, Forums and others.

QOU Digital Content Repository
- It is an open access repository operated by the Dublin Core metadata standards, and used for storing, retrieving, and indexing the digital content to re-use it independently in various contexts and in different platforms. QOU DCR contains many formats of the digital learning content such as learning objects, self-Learning Open Online Courses (sLOOC), graphs, info graphics and others.

QOU Video Platform (QTube)
- It is an open access and interactive video platform that enables learners to share, play back and download educational videos that produced by QOU SAT. Channel. Qtube also is a social based platform it is offering interactive tools for interaction and collaboration such as the ability to make likes and comments. Qtube contains videos in different domains such as education, math, statistics, psychology, business administration, accounting, computer, and others.

QOU Slide Share Platform (QOU SlideShare)
- It is an open access and interactive platform to view, share, and download learning slides and documents prepared by the instructors. QOU SlideShare also enables learners to make comments and collaborate with other learners and with instructors.

QOU Mobile Apps (Hosted on Google Play Store)
- QOU is offering self-Learning Open Online Courses (sLOOC) and educational games as open access mobile apps in Google Play for all QOU students and learners worldwide.

QOU Satellite Channel (QSC)
- QSC is an open access educational satellite broadcasting service that produce all educational video lectures that broadcasted on TVs, published on QOU Video Platform (Qtube), and used in developing the self-Learning Open Online Courses (sLOOC).

Figure 5:

QOU Model technical components

1.5.1 QOU SERVICES MODELING FOR E-LEARNING

- **1.5.1.1 E-LEARNING STRUCTURE AND RELATIONSHIPS**

Figure 6 below shows the e-Learning components structure at QOU and the relationships between them. QOU e-Learning structure includes seven components, 4 as digital content providers hosted by QOU, 1 as a third party, and 2 hosted by QOU as service brokers for the digital content.

Service: It is the digital learning content and can be in various formats such as Videos, PPTs, and other content, including text, infographics, graphs, games, interactive activities & assessments.

Service Providers: open access, host digital content, give direct accessibility for students, and may provide a service for another service provider, i.e., QOU SAT Channel provides Qtube with educational videos, and at the same time, it provides direct video broadcasting services through TVs.

Service Brokers: need student authentication, do not host digital content but give students the reachability for the digital content through the service providers.
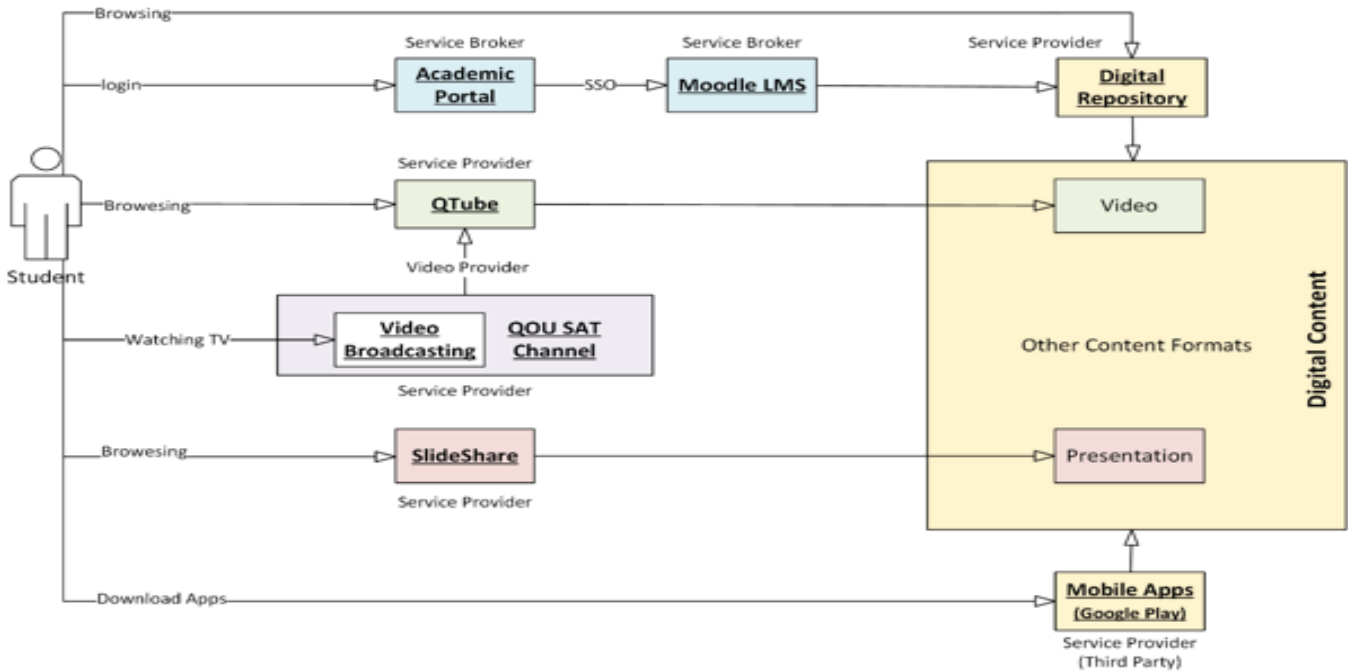
Figure 6:

e-Learning Services Block Diagram

- **1.5.1.2 QOU E-LEARNING MODEL DESIGN**

To clarify the e-learning model in QOU in terms of the design issue, the use case diagrams are used as a modeling technique to describe the dynamic behavior of the model and to simulate the real interaction of the students within the model and the interaction of the different platforms and services within the model.

Figure 7, below shows 2 types of interactions in the model as the following:

Student Interaction: indicated by red arrows and represents 6 platforms or services that students can access. Each platform or service has its internal interactions.

Platform Interaction: indicated by blue arrows and represents 6 interactions between the different platforms or services represented in figure 6. Services are summarized in Table 2.
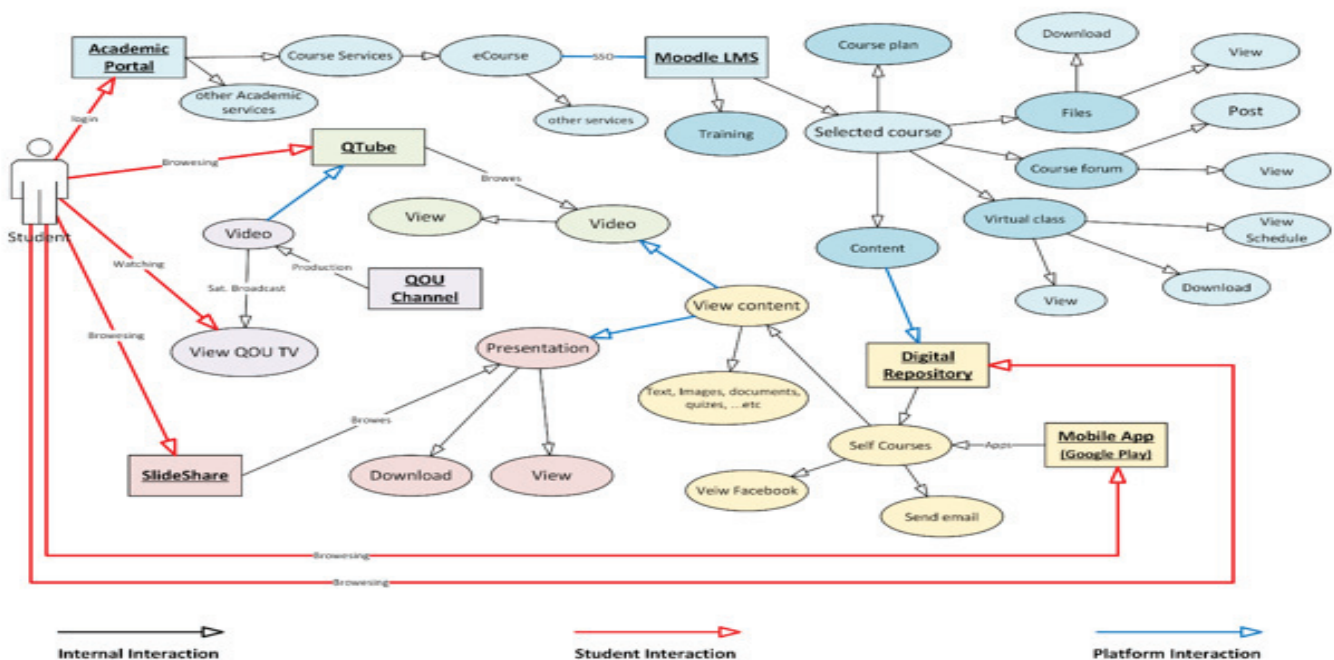

Figure 7:

Use Cases Diagram

9

- ## 1.5.1.3 QOU E-LEARNING USE CASES DIAGRAM OVERVIEW

Reachability Issues: many navigation levels until the student gets the services attached with Moodle. Dispersion Issues: many independent services need to be accessed from different locations. Platform Relationships: there is an integral relationship between Repository, Qtube, SlideShare, and QOU Channel in providing the digital content. However, it is not clear for the Academic portal and Moodle. Moodle Services need to be re-identified in terms of the relationship with the other services.

Figure 8:

Separated Use Case Diagram

- ## 1.5.1.4 QOU E-LEARNING USE CASES DIAGRAM OVERVIEW

Reachability Issues: Many levels of the navigation until students get the services that are attached to Moodle. Dispersion Issues: Many independent services need to be accessed from different locations.

Platform Relationships: There is an integral relationship between Repository, Qtube, SlideShare, and QOU Channel in providing the digital content. However, it is not clear for the Academic portal and Moodle. Moodle Services need to be re-identified in terms of the relationship with the other services.
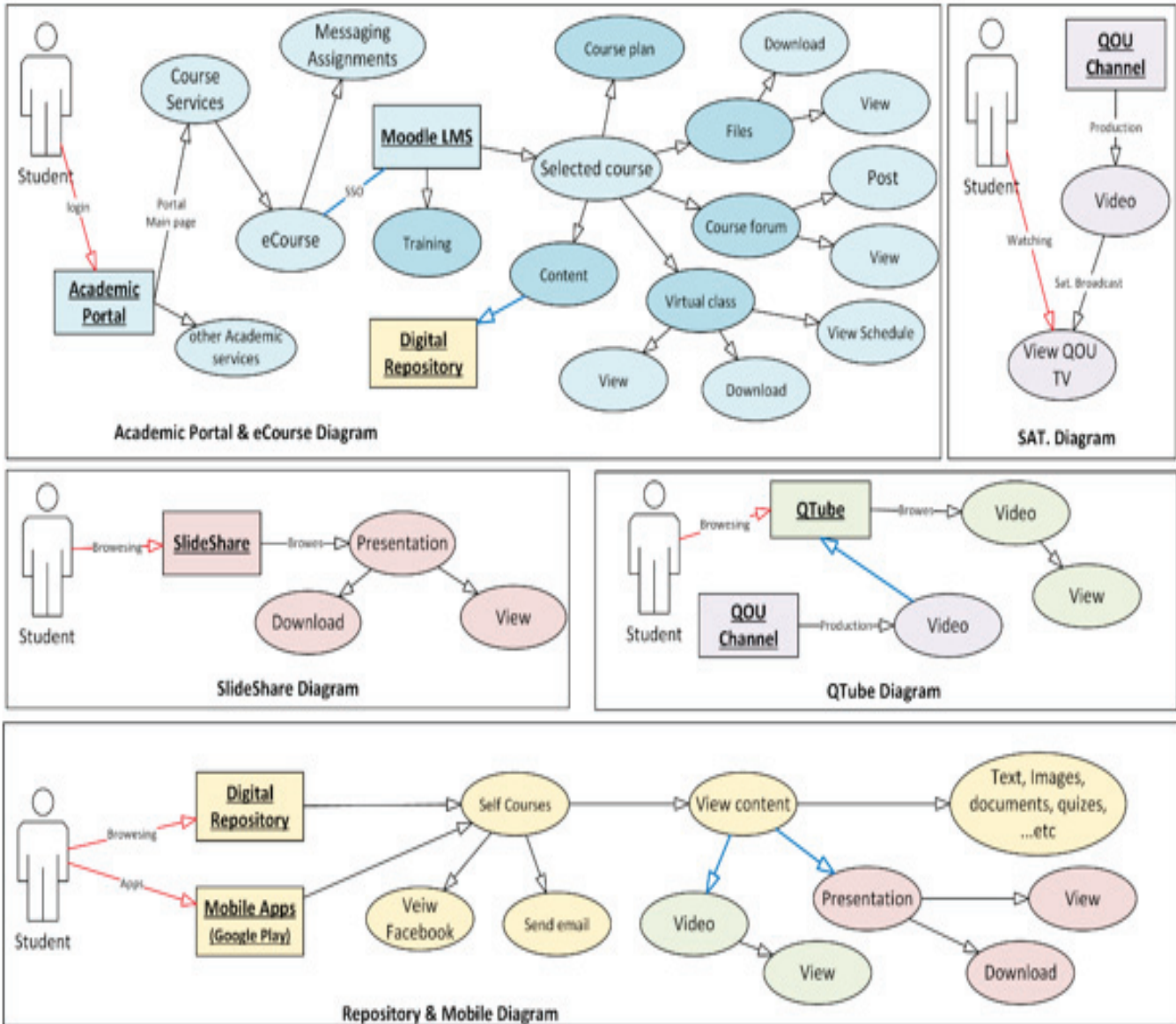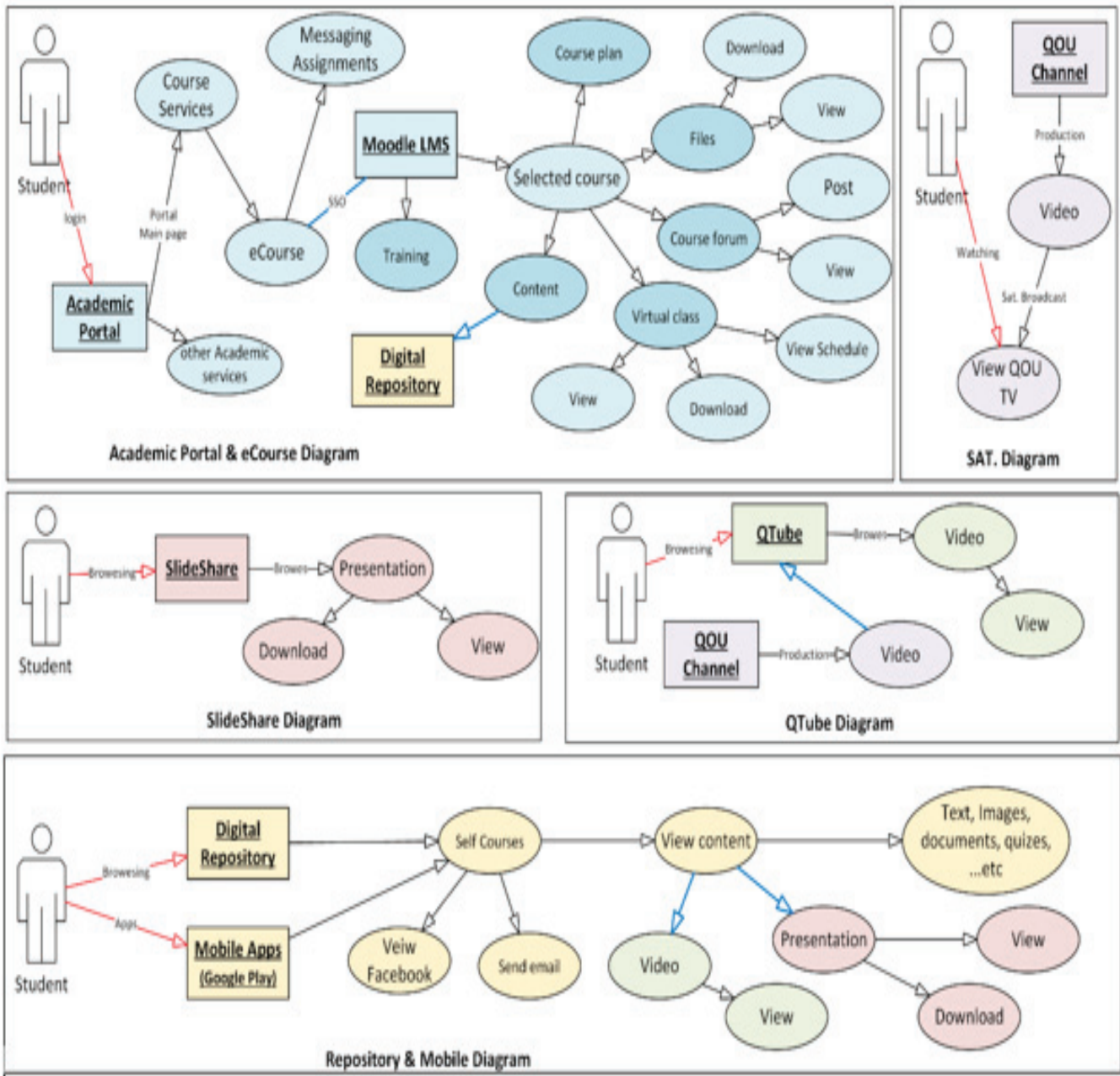
Figure 8:

Separated Use Case Diagram

Table 2:

List of QOU Services Supports QOU-ODL

Service Name	Service URL	Description
DS pace	https://dspace.qou.edu/	Open access digital repository to capture, store, organize, index, preserve, and provide access to its digital assets and intellectual output, such as QOU's scientific journals, scholarly papers, thesis, articles, projects, books, digital learning content, SMART courses, and others
Qtube	https://qtube.qou.edu/	Open educational resources (OER) site in Arabic provides you with a variety of high-quality videos sorted by topics and easy access
SlideShare	https://slideshare.qou.edu/	An open educational resource to share courses presentations, infographics, and other documents
Virtual Classes	https://vc.qou.edu/	A cluster of big blue button servers, which can serve 7000 concurrent users (20 servers * 5 sessions * 70 participants)

Service Name	Service URL	Description
e-Course	https://ecourse.qou.edu/	QOU LMS provides QOU students with different services for each course, such as course plans, file exchange, virtual classes, forums, and others
e-Activity	https://activity.qou.edu/	Students can submit their assignments through this service
MOOC	https://tadreeb.qou.edu/	MOOC platform support massive open online courses
e-learning Site	https://e-learning.qou.edu/	e-learning website, which contains information about QOU e-learning services, and you can access it through this page
Teaching English	https://teachingeng.qou.edu/	LMS platform dedicated to teaching English language with special plugins
Faculty of Media Students Blog	https://msblog.qou.edu/	Blog used by Media faculty-students and staff to publish their articles, news, and other media contents.
Diploma	https://diploma.qou.edu/	LMS used for diploma programs
Open Online Courses	https://ooc.qou.edu/	Open access learning courses- 2014
m-Learning	https://mlearning.qou.edu/	Mobile learning site- 2013
e-Training	https://etraining.qou.edu/	LMS training platform is used for training various sectors from QOU and social society for e-Learning Technologies and methodology 2008
RUFO Project	http://rufo.qou.edu/	The Interuniversity Network for Open and Distance Learning Project - 2006
Avicenna Project	http://avicourse.qou.edu/	The Avicenna Virtual Campus Network (AVCN) Project - 2004

In this research, we worked on the importation of the e-Learning Maturity Model on the electronic component of blended learning at al-Quds Open University. All e-MM dimensions were considered and visited, and it was found to be applicable in most of its aspects. The dimensions were provided by the e-MM that covers delivery, planning management, and optimization. The model aspect process was conducted in accordance with the standard recommendations of the e-MM. In section 2, we discussed the methodology of conducting e-MM process, which depended on partitioning the questionnaire according to the stakeholders within the University, as mentioned in section 2. The participants were asked according to this division, and the answers were reflected to form the case implantation in section 3. The results were discussed in section 4, and recommendations were proposed according to the organizational gaps found. Finally, suggestions were made to fill in the gaps reflected in the e-MM.

RESEARCH PROBLEM AND METHODOLOGY

The research conducted the e-MM survey on the University environment through interviews with stakeholders. The interviews included officials in Table 3 as well as students from undergraduate and graduate programs. The total number of interviews was 11.

Furthermore, the research proposed recommendations to enhance university performance from the e-MM point of view.

The research conducted the following steps:

1. Stakeholder's identifications. Table 3 reflects involved positions included in building the questionnaire, regardless of the organizational structure within Al-Quds Open university

2. Conduct structured interviews with each stakeholder in accordance with the e-MM points that relationship with this stakeholder in Table 3 below.

3. Construct the e-MM summary illustrated in Table 4.

4. Provide suggestions on enhancing organizational performance according to e-MM illustrated in Table 1 based on model outcomes and interviews.

5. Discuss the shortcoming of the model.

The table below distributes the dimensions of the e-MM and relates them to the university positions. Each dimension is discussed and resolved as reflected in the e-MM.

Table 3:

distributing of e-MM components over QOU stakeholders

Position included	QOU Department	e-MM Components explained in Table 4
Academic Vice President office		
Deans	Academic Affairs	L1, L2, L3, L4, L5, L6, L7, L8, L9, L10,E2,E3,O2,O6,O7,O8,O9
Head of Department	Academic Affairs	L1, L2, L4, L5, L6, L7, L8, L9, L10,S5,S6,E1,E2,E3,O2,O6,O7,O9
Instructor	Academic Affairs	L1, L2, L5, L6, L8, L10,D1,D4,S5,S6,E1,E2,E3,O2,O7
Curricula and pedagogy Department	Academic affairs	L1, L10,O2
Online course author	Open Learning Center, Academic Affairs	L1, L5, L7, L10,D1,D3,D4,E3,O2
Online course reviewer	Open Learning Center, Academic Affairs	L1, L5, L7, L10,D1.D3,D4,E3,O2
Information and Communication Technology and Media Production Affairs		
Instructional designer	Open Learning Center	L1, L5, L7, L10,D1,D1,D3,D4,E1,E3
Course developer	Open Learning Center	L5,D3,D4,E1
Information technology	Information Technology Center	S1,D3,D5,D6,D7, S2,O1, O3,O4,O5,O9
e-learning support staff	Open Learning Center	L2, L4, L7, L8, L9, S1,D1,D1,D3,D5,D7, S2,S3,S4,S5,S6,E1,O6,O7,O9
Technical support staff	Information Technology Center, Open Learning Center	L2,, S1,D1,D2,D3,D5,D6,D7, S2,S3,S4,S5,S6,E1,O5
Software engineering	Information Technology Center	D3,D5,D6,D7,O1, O3,O4,O5
System Engineering	Information Technology Center	D5,D6,D7,O1,O3,O4,O5
Educational video production	Media Production Center	D5,D6, L7, L10,D1
Deanship of Students Affairs		
Students affairs	Students Affairs	L2, L3, L4, S1,D4,S3,S4,E1,O6,O7,O8
Undergraduate student	Students Affairs	L2, L3, L4, L5, L6, L9, S1, S2,S3,S4,E1,O6,O7, O8
Graduate student	Students Affairs	L2, L3, L4, L5, L6, L9, S1, S2,S3,S4,E1,O6,O7,O8
Deanship of Registration		
Dean of registration	Deanship of Registration	L5, L9, S1
Examination department	Deanship of Registration	L8, L9

Case Implementation And Results

The case implementation -as explained in the methodology- was conducted on stakeholders, and the summary of the process results is illustrated in the table below. Figure 3 and Figure 4 interpret the color-coding.

Table 4:

e-MM case implantation Tracks and results

	Delivery	Planning	Definition	Management	Optimization
Learning: Processes that directly impact pedagogical aspects of e-learning					
L1 — Learning objectives guide the design and implementation of courses	black	blue	blue	blue	blue
L2 — Students are provided with mechanisms for interaction with teaching staff and other students	blue	blue	light blue	black	black
L3 — Students are provided with e-learning skill development	blue	blue	black	blue	light blue
L4 — Students are provided with expected staff response times to student communications	blue	blue	blue	light blue	blue
L5 — Students receive feedback on their performance within courses	light blue	black	blue	blue	light blue
L6 — Students are provided with support in developing research and information literacy skills	blue	blue	black	blue	light blue
L7 — Learning designs and activities actively engage students	blue	black	black	blue	light blue
L8 — Assessment is designed to progressively build student competence	blue	black	blue	blue	blue
L9 — Student work is subject to specified timetables and deadlines	black	black	blue	blue	blue
L10 — Courses are designed to support diverse learning styles and learner capabilities	blue	blue	blue	blue	white
Development: Processes surrounding the creation and maintenance of e-learning resources					
D1 — Teaching staff are provided with design and development support when engaging in e-learning	black	blue	black	black	black
D2 — Course development, design, and delivery are guided by e-learning procedures and standards	black	black	blue	black	blue
D3 — An explicit plan links e-learning technology, pedagogy and content used in courses	black	black	black	blue	black
D4 — Courses are designed to support disabled students	black	black	blue	black	blue
D5 — All elements of the physical e-learning infrastructure are reliable, robust, and sufficient	black	blue	black	black	black
D6 — All elements of the physical e-learning infrastructure are integrated using defined standards	black	black	black	black	black
D7 — E-learning resources are designed and managed to maximize reuse	black	black	black	blue	blue
Support: Processes surrounding the support and operational management of e-learning					white
S1 — Students are provided with technical assistance when engaging in e-learning	black	blue	black	black	blue
S2 — Students are provided with library facilities when engaging in e-learning	black	blue	black	light blue	light blue
S3 — Student enquiries, questions, and complaints are collected and managed formally	blue	black	blue	light blue	light blue
S4 — Students are provided with personal and learning support services when engaging in e-learning	black	blue	white	blue	blue
S5 — Teaching staff are provided with e-learning pedagogical support and professional development	black	blue	black	black	blue

		Delivery	Planning	Definition	Management	Optimization
S6	Teaching staff are provided with technical support in using digital information created by students	Black	Black	Black	Dark Blue	Dark Blue
	Evaluation: Processes surrounding the evaluation and quality control of e-learning through its entire lifecycle					
E1	Students can provide regular feedback on the quality and effectiveness of their e-learning experience	Light Blue	Dark Blue	Dark Blue	Light Blue	Dark Blue
E2	Teaching staff can provide regular feedback on the quality and effectiveness of their e-learning experience	Light Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue
E3	Regular reviews of e-learning aspects of courses are conducted	Dark Blue	Light Blue	Light Blue	Light Blue	Light Blue
	Organization: Processes associated with institutional planning and management					
O1	Formal criteria guide the allocation of resources for e-learning design, development, and delivery	Black	Black	Black	Light Blue	White
O2	Institutional learning and teaching policy and strategy explicitly address e-learning	Black	Light Blue	Dark Blue	Dark Blue	Light Blue
O3	e-learning technology decisions are guided by an explicit plan	Dark Blue	Dark Blue	Light Blue	Light Blue	Light Blue
O4	Digital information use is guided by an institutional information integrity plan	Black	Black	Dark Blue	Dark Blue	White
O5	e-learning initiatives are guided by explicit development plans	Dark Blue	Dark Blue	Light Blue	Light Blue	Light Blue
O6	Students are provided with information on e-learning technologies prior to starting courses	Light Blue	Light Blue	Black	Dark Blue	Light Blue
O7	Students are provided with information on e-learning pedagogies prior to starting courses	Light Blue	Light Blue	Dark Blue	Dark Blue	Dark Blue
O8	Students are provided with administration information prior to starting courses	Black	Black	Dark Blue	Light Blue	Light Blue
O9	e-learning initiatives are guided by institutional strategies and operational plans	Black	Light Blue	Dark Blue	Dark Blue	Light Blue

RECOMMENDATIONS ON BOOSTING E-LEARNING IN QOU BASED ON E-MM

The Recommendations based on e-MM to increase the maturity level of e-Learning systems of Al-Quds Open University can be summarized as follow:

1. Boosting the governance of e-learning through defining a higher authorization entity within academic affairs.

2. Although the University has very strong organizational planning structures and methodologies, e-Learning planning may need to be discussed on a broader basis of the University and include more instructors, students, and other stakeholders through contentious workshops and other internal communication methodologies.

3. Although students are taught the teaching and learning styles in a specific course called "Learn how to learn", students' opinions of e-learning planning, implementation, and support may be reflected and adapted in a formal style.

4. Introducing a separate planning strategy of e-learning as a cascade of organizational strategies.

5. Introducing a separate e-learning risks identification and management document.

6. Introducing a separate information systems strategy as a cascade of organizational strategy.

7. Increasing the action research on evaluating the performance and impacts of certain e-learning methods and interventions and utilizing their outcomes in e-learning planning.

8. Although several e-learning content creation standards are explained in handbooks, guides, and standards soft copies. However, workflows of content creation need documentation and monitoring accordingly.

9. Although the University has documented procedures for most of the e-learning processes regarding course creation and design, it may consider the continuation of this effort to cover all the aspects of e-learning.

10. Enriching and diversifying the evaluation and testing methodologies where applicable.

11. Encouraging students to attend the university libraries through increasing activities that require visiting the library, especially for undergraduate students.

12. Establishing a clear workflow between books authorship and e-Content creation to guarantee a formal transfer between textbook pedagogies and content. The process currently functions depending on the instructor's expertise; still, it needs formal identification.

13. Provision of Instructors with formal methods on the evaluation of electronic content and suggested predefined pedagogies.

14. Developing a unified content creation between textbooks, other content styles, and several contracting forms of e-Content since the current process is conducted informally.

15. Providing the students with a formal method of feedback on the e-Content as well as the electronic teaching and learning process of a certain course.

16. Although the University has a long-term investment in supporting visually impaired people, they still need additional support in e-Content.

17. Creating a pilot project on student progress measures within a certain electronic course.

CONCLUSION

In this study, we worked on the import from al-Quds Open University of the e-learning Maturity Model of the complementary electrical component. All the e-MM elements were studied, visited, and applied to most parts of the e-learning Maturity Model. The e-MM provided the delivery, plan management, and optimization as well as dimensions. The method adopted the suggestions from the e-MM in dealing with the model aspect. Then we examined the technique of carrying out the e-MM process, which relied on the University's stakeholder division of the questionnaire.

Furthermore, the stakeholders were considered in accordance with their functional duties in the organizational units. Regarding the questionnaire items, the participants were asked accordingly. The solutions were illustrated in al-Quds Open University case implementation. The recommendations proposed were based on the organizational gaps and solutions to address the gaps represented in the e-MM.

The model implementation revealed significant and considerable organizational achievements in pedagogy, organization, documentation of the establishment of core courses and processes, as well as assistance for tutors and students. The institution has also proven a very dependable and mature e-learning infrastructure and technological capacity. Moreover, the significant shortcomings are related to the need to set up standalone strategic planning for e-learning as well as to increase the documentation of procedures and workflows to overcome the fundamental processes of e-learning in all areas. Finally, it is very important to modify the model to address blended learning besides e-learning in the future.

References

- Andersen Kim Viborg, & Zinner Henriksen (2006). E-government maturity models: Extension of the Layne and Lee model.Government Information Quarterly Volume 23, Issue 2, 2006, Pages 236-248

- Blanco-Ramírez Gerardo . & Joseph Berger(2014). Rankings, accreditation, and the international quest for quality: Organizing an approach to value in higher education Quality Assurance in Education 22(1).

- Casanova Diogo, & Linda Price,& Avery Barry (2018). Supporting Sustainable Policy and Practices for Online Learning Education. Book chapter: Climate Literacy and Innovations in Climate Change Education

- Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. AAHE Bulletin 1987, 39(7), 3-7

- Dhir, S. K., Verma, D., Batta, M., & Mishra, D. (2017). E-Learning in Medical Education in India. Indian Pediatrics, 54(10), 871-877. doi: 10.1007/s13312-017-1154-7

- Esteban Tocto-Cano, Sandro Paz Collado, & Javier Linkolk López-Gonzales, Josué E. Turpo-Chaparro.A Systematic Review of the Application of Maturity Models in Universities. the Journal of Innovations in Education and Teaching International 57(4):434-449

- Hijazi Haneen , & Hammad Bashar , & Al-Khasawneh Ahmad (2019). Modelling and Implementation of Proactive Risk Management in e-Learning Projects: A Step Towards Enhancing Quality of e-Learning. International Journal of Advanced Computer Science and Applications 10(5):235-251

- Ignacio José, & PALACIOS OSMA, & Diego Alexander, & GÓMEZ LÓPEZ (2021). Maturity Model for Virtual Education.niversidad Distrital Francisco José de Caldas, Bogotá, Colombia Volume 2020, Article ID 228061, Journal of e-Learning and Higher Education, 11 pages

- International Standards Association (ISO) ISO/IEC TS 33061:2021. www.iso.org

- Iskandar George (2012). Exploring the Dimensions of E-learning Maturity Model. International Journal of Emerging Technologies in Learning (iJET) 7(2)

- Lacerda Thaísa C., & Christiane Gressevon Wangenheim (2018).Systematic literature review of usability capability/maturity models. Elsivir Computer Standards & Interfaces Volume 55, January 2018, Pages 95-105

- Marshall Stephen (2007). RoE-Learning Maturity Model Process Descriptions. Ministry of Education New Zealand. Online resource: http://e-learning.geek.nz/eMM/publications.php

- Marshall, Stephen. (2006). eMM Version Two Process Guide. Wellington: Victoria University of Wellington.

- Marshall Stephen (2012). Improving the quality of e-learning: Lessons from the e-MM. February Journal of Computer Assisted Learning 28(1):65-78

- Marshall Stephen (2016). Quality as sense-making. Quality in Higher Education Journal 22(3):1-15

- Marshall, S. (2010). A quality framework for continuous improvement of e-Learning: The e-Learning Maturity Model. International Journal of E-Learning & Distance Education, 24(1), 143-166.

- Mirzayi, Khalil and M. Sepahpanah. (2021). A Study of E-Learning Maturity in Higher Agricultural Education Using Artificial Neural Network0.Department of Entrepreneurship Development and Sustainable Rural Employment Studies. Jahad University, Hamedan, Iran.

- Neuhauser Charlotte (2004). A maturity model: Does it provide a path for online course design?.Journal of Interactive Online Learning 3(1)

- Oxford Dictionaries. 2021. "Maturity." Accessed Septemper 6, 2021. https://en.oxforddictionaries.com/

- Paulk M. C., B. Curtis, M. B. Chrissis, and C. V. Weber (1993). Capability maturity model, version 1.1. in IEEE Software, vol. 10, no. 4, pp. 18-27, July 1993.

- Rogério Rossi, & Pollyana Notargiacomo (2015). eQETIC: a Maturity Model for Online Education. Interdisciplinary Journal of e-Skills and Lifelong Learning 11:011-023

- Santos-Neto João, & Costa Ana (2020).Enterprise maturity models: a systematic literature review. Enterprise Information Systems Journal. ISSN: 1751-7575 (Print) 1751-7583 (Online) Journal https://www.tandfonline.com/loi/teis20

- Sherry, A. C. (2003). Quality and its measurement in distance education. In M. G. Moore & W. G. Anderson (Eds.), Handbook of Distance Education (pp. 435-459). Mahwah, NJ: Lawrence Erlbaum Associates.

- SPICE Software Process Improvement and Capability Determination 18th International Conference, SPICE 2018, Thessaloniki, Greece, October 9–10, 2018, Proceedings Editors

- Tarhana Oktay, and Turetkenb, and Hajo A.Reijersc (2016)Business process maturity models: A systematic literature review. Information and Software Technology Volume 75, July 2016, Pages 122-13