IS E-LEARNING CAPABLE AND MATURE? APPLYING EMM TO JORDANIAN UNIVERSITIES

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Abstract:
Most Jordanian universities have invested in some sort of e-learning systems in order to support “blended learning” or pure “on-line learning” modules. Recently, an increasing number of private and public universities adopted e-learning to enhance the effectiveness and quality of teaching and learning and reduce the costs. E-Learning Maturity Model (eMM) is a tool for assessing current capability and provides a quality improvement for e-learning projects. Assessments of e-learning capability have been made of 8 universities in Jordan for this research; 3 public and 5 private universities.

Across the universities assessed, there is clear evidence that some universities are more capable than other universities in the five categories assessed (Delivery, Planning and Definition dimensions). However, there is very little evidence of capability in the management and optimization dimensions across all the universities assessed. E-learning Maturity Model (eMM) has a number of benefits for the universities assessed, as it provides a road map for universities to improve their e-learning quality.

The results of this research are hoped to be useful for researchers and policy makers as they provide a clear insight to other developing countries about the capability and maturity of e-learning projects in Jordanian universities when planning for and developing their e-learning systems.

Keywords: e-Learning, Maturity, Capability, eMM, Jordan.

1 INTRODUCTION:
E-learning is about the delivery of course content through electronic media, such as Internet, Intranets, Extranets, satellite broadcast, audio/video tape, interactive TV, and CD-ROM (Urdan & Weggen, 2000; Al-Yaseen et al., 2011; Ramayaha and Lee, 2012). E-learning has been viewed as identical with web-based learning, Internet-based training, advanced distributed learning, web-based instruction, online learning and open learning (Khan, 2001; Tagoe, 2012). E-Learning has many benefits (Alexander, 2001; Marengo and Marengo, 2005; Brady et al., 2010; Paechter et al., 2010) that can be delivered. E-learning system can be a synchronous (real time) or asynchronous (anytime and/or anywhere); synchronous learning can supports live; oral; visual communications between instructors and students. Synchronous learning can be attained by using the audio systems to support oral communications or by using of interactive keypad devices to support the exchange of data and voice or by using of the videoconferencing technologies. In asynchronous learning the communication between instructors and students at a different time and can be achieved using text material; recorded video and recorded audio (Al-Yaseen et al., 2011).

E-Learning in developing countries is a fast growing market; the average money spent on education is considerably higher than the international average. There is a strong interest in education, motivated by large-scale changes both within the national and the global economic systems (Al-Yaseen et al., 2011).
1.1 Higher education in Jordan:

Three new public universities have been established recently reaching a total of 10 public universities in the country. Private universities have seen a rapid increase in enrolments as well. Since 2000 to 2006, enrolment in 12 private universities grew by about 18 percent annually from 36,642 to 55,744. The enrolment cap in the private universities restricts the ability of university to absorb increasing number of higher education students. Projection for the number of students entering university is 92,000 per year by 2013 up from 50,469 in 2005 (World Bank, 2009).

Studies at university level in Jordan have three stages: stage one (undergraduate level): Bachelor's Degrees normally takes four or five years depending on the field of study. Stage two (Postgraduate level): a Master's degree is awarded after a further one to two years' study following a Bachelor's Degree. Stage three (Doctorate): a Doctorate Degrees is awarded after three to five years of further study and the submission of an original dissertation. Non-traditional studies: Distance higher education, this type of education is offered at the newly established branch of the Arab Open University (MoHESR, 2012).

The first Jordanian university, the University of Jordan was established in 1962. Today there are eleven public universities. In the past, higher education was the exclusive duty of government, but the role of the state in this sector decreased with the establishment of the first private university, Amman Al-Ahliyya University, in 1990. The emergence of private universities was a necessary development to face the problem of the lack of university seats and to solve the problem of increasing demand. Privatization of higher education has increased gradually and today there are sixteen private universities. Foreign universities became also common in higher education. (i.e., German Jordanian University, established in 2005, Arab Open University established in 2002 to provide continuous education for all ages, New York Institute of Technology, DePaul University, Columbia University, German-Jordanian University and the American University); George Washington University has a plan to open a medical university in Jordan.

Most universities have invested in some sort of e-learning systems in order to support “blended learning” or pure “on-line learning” modules. Recently, an increasing number of private and public universities who are adopted e-learning to enhance the effectiveness and quality of teaching and learning and reduce the costs (Al-Yaseen et al., 2011).

The paper is structured as follows: the introduction included a review of the education system in Jordan. Section 2 discusses the e-Learning Maturity Model (eMM). Section 3 discusses the research approach followed by a discussion of the main findings in section 4. Finally, in section 5 the main conclusions, recommendations and the lessons learnt of the paper are discussed.

2 E-LEARNING MATURITY MODEL (eMM):

The e-Learning Maturity Model (eMM) is a tool for assessing current capability and provides a quality improvement by which the universities can assess their capability in order to develop, deploy and support e-learning (Marshall and Mitchell, 2005, 2006, 2007; Marshall, 2010a; 2010b; 2011). The eMM has been applied in New Zealand (Marshall, 2006a; Neal and Marshall, 2008), the United Kingdom (Bacsich, 2006; 2008; Sero, 2007) and is currently being applied in universities in Australia, the United States (Marshall et al., 2008) and Japan. The eMM divides the capability of the university into 35 processes grouped into five major categories or process areas (Learning category, Development, Support, Evaluation and Organization). Learning process is directly impact on pedagogical aspects of e-learning; development process is surrounding the creation and maintenance of e-learning resources; support process is surrounding the support and operational management of e-learning; evaluation process surrounding the evaluation and quality control of e-learning through its entire and organization process is associated with institutional planning and management. Each process or category is assessed of five dimensions (Delivery, Planning, Definition, Management and Optimization). Delivery dimension is concerned with the creation of process outcomes; planning dimension assesses the use of predefined objectives and plans in conducting the work of the process; definition dimension covers the use of institutionally defined and documented guidelines, standards,
templates and policies during the process implementation; management dimension is concerned with how the institution manages the process implementation and ensures the quality of the outcomes of e-learning and the optimization dimension captures the extent to which an institution is using formal approaches to improve the activities of the process (for more details on eMM, see Marshall, 2010a; 2010b).

3 RESEARCH APPROACH

There are 27 universities in Jordan; 10 public and 17 private universities. Assessments of e-learning capability have been made of 8 universities in Jordan for this research; 3 public and 5 private universities using the methodology of Marshall and Mitchell (2002; 2003; 2004). The questionnaire was sent to the people who are directly involved in developing and implementing e-learning projects in these public and private universities in Jordan.

The questionnaire assesses the capability of the university through 35 processes grouped into five major categories or process areas; each process is broken down within each dimension into practices (for example, see Figure 1).

![Figure 1: Snapshot of eMM capability assessment practices and exemplars (from Marshall, 2007)](image)

Then each practice is assessed for each process for performance from (Not practiced/not adequate) to (Fully adequate) as shown in Figure 2; the ratings of each dimension are done based on the evidence collected from the university whether or not the practice is performed. Data collection for this research took place through October, 2012 to May, 2013.

![Figure 2: eMM capability level ratings (based on Marshall, 2007)](image)

4 FINDINGS AND DISCUSSION

The following sub-sections illustrate a recent university assessments of e-learning capability undertaken in 8 Jordanian universities using version (2.3) of the e-learning maturity model (eMM)
(Marshall, 2007) in order to exemplify how the assessments are envisage and how this data/information can be used to assess strengths and weaknesses of each university.

4.1 Learning process:

Figure 5 presents the results of assessments of learning category; it includes ten processes (L1-L10) that directly impact on educational aspects of e-learning throughout five dimensions (delivery, planning, definition, management and optimization).

**Delivery dimension** is concerned with the creation and current status of process outcomes. Assessments of this dimension are aimed at determining the degree to which the process is seen to activate within the university (Marshall, 2007). Through the eight universities assessed a variety of capabilities were found. Some universities such as (A, B, D, E and H) were assessed as having strong capability in the learning category showing fully adequate capability in all processes, as they (A, B, D, E and H universities) have clear, well structured learning objectives and learning outcomes; providing their students with mechanisms for interaction with teaching staff; skill development; expected staff response time; feedback on students’ performance within the courses; support, and clear timetables and deadlines. F university was assessed as having largely to fully adequate capability in the learning category in most processes. C and G universities are not as capable as other universities with evidence that the learning process is not performed well (partially adequate rating of the delivery dimension in most processes).

**Planning dimension** is concerned about assessing the use of predefined objectives and plans in conducting the work of the process. B, D, E and H universities perform the learning process very well (fully adequate rating for the planning dimension). A, F and to some extent C universities are not performing the learning process well (partially adequate rating for planning dimension). G university shows absence in the learning process (not adequate rating for the planning dimension) in all the learning area processes.

**Definition dimension** covers the use of institutionally defined and documented standards, guidelines, templates and policies during the process implementation. E and to some extent B and D universities are more capable in the learning process in this dimension (definition) than other universities with evidence that the learning process is mostly performed well. A, F and H universities are mostly not performing the learning process well (partially adequate rating of L1, L2, L3 and L9 processes) while showed absence in providing students with expected staff response times and engaging students learning design (L4 and L7) and showed. C and G universities showed absence in most learning process of the definition dimension.

**Management dimension** is concerned with how the institution manages the process implementation and ensures the quality of the outcomes. D and E universities are not performing the learning process well (partially to largely adequate rating of the management dimension processes). B and H universities are significantly less capable in the learning process with evidence shown by the partially adequate rating for (L1, L2, L3 and L8) and absence in the other management dimension processes. A, C, F and G universities showed absence in the learning process (not adequate rating for the management dimension).

**Optimization dimension** captures the extent university is using formal and systematic approaches in order to improve the activities of the process to achieve pre-defined objectives and learning outcomes. A, D and E universities showed a little evidence of capability that the process is performed well (partially adequate rating for the Optimization dimension). B, C, F, G and H universities showed no evidence of capability in performing the learning process (not adequate rating of the optimization dimension).
4.2 Development process:

Figure 6 presents the results of assessments of development category, it includes seven processes (D1-D7) that surrounding the creation and maintenance of e-learning resources throughout five dimensions (delivery, planning, definition, management and optimization).

**Delivery dimension**: A, B, D, E and H universities are mostly performing the development process very well with evidence shown by the largely to fully adequate rating of the delivery dimension. F university and to some extent G university are not performing the development process well with evidence shown by the partially to largely adequate rating for the development dimension. In G university, there is no explicit plan links e-learning technology, pedagogy and content used in courses; courses are not designed to support disabled student, the physical e-learning infrastructure are not reliable, robust or sufficient, and e-learning infrastructure are not integrated using defined standards. C university is not performing the development process well with evidence shown by not adequate rating for delivery dimension in all the seven processes.

**Planning dimension**: E university and to some extent D is mostly performing the development process well with evidence shown largely to fully adequate rating of the planning dimension. E university showed full capability in processes (D2-D6) and large capability in processes (D1, D7) while university D showed full capability in only (D3 and D4) processes. A, B, F and H universities are significantly less capable in the learning process with evidence shown by the partially adequate and in some development processes largely (D2) rating for the planning dimension. University H showed full capability in providing its teaching staff with design and development support when engaging in e-learning. C and G universities showed absence in performing the development process (not adequate rating for the planning and definition dimensions in all processes D1-D7).

**Definition dimension**: E university is mostly performing the development process very well (largely to fully adequate rating of the definition dimension). A, B, D, F and H universities are significantly performing the development process well (partially to largely adequate rating of the definition dimension). G university showed partial capability in providing teaching staff with design and development support when engaging in e-learning; Course development, design and delivery are guided by e-learning procedures and standards; and in having explicit plan links e-learning technology, pedagogy and content used in courses. There is little evidence across the 8 universities that courses are designed to support disabled students (process D4 in definition, management and optimization dimensions).

**Management dimension**: B, D and E universities are mostly performing the development process well with evidence shown by the largely adequate of the management dimension except in managing the design of the courses in order to support disabled students. A, C, F, G and H universities are mostly not performing the development process well with evidence shown by the partially adequate of the management dimension and showed absence capability in most processes.

**Optimization dimension**: A and E universities are mostly not performing the development process well with evidence shown by the partially to largely adequate of the optimization dimension. University A showed large capability in using formal and systematic approaches in order to provide teaching staff with design and development support when engaging in e-learning and to guide Course development, design and delivery by e-learning procedures and standards. B, C, D, F, G and H universities showed absence in performing the development process (not adequate rating for the
optimization dimension) as they do not have formal or systematic approaches in order to improve the activities of the development process to achieve pre-defined objectives and learning outcomes.

Figure 4: eMM assessments of Development category of 8 Jordanian universities arranged by dimension

4.3 Support process:

Figure 7 presents the results of assessments of support category; it includes six processes (S1-S6) that surrounding the support and management of e-learning.

**Delivery dimension:** A, B, D, E and H universities are performing the support process very well with evidence shown by the fully adequate of the delivery dimension. F and to some extent G universities are mostly performing the support process well with evidence shown by the largely adequate of most of the variables in the delivery dimension. However, C university is not performing the support process well with evidence shown by the partially adequate for all the delivery dimension.

**Planning dimension:** E university is the only one which performing the support process very well with evidence shown by the fully adequate of the planning dimension. B, D and H universities are performing the support process well with evidence shown by the largely adequate of most of the variables in the planning dimension. C and G universities showed absence in performing the support process with evidence of not adequate rating for the planning dimension, as the students are not provided with technical assistance and they were not provided with library facilities when engaging in e-learning, further, teaching staff are not provided with e-learning pedagogical support nor technical support.

**Definition dimension:** B and E universities are performing the support process well with evidence shown by the largely adequate of the definition dimension. A, D, F, H and to some extent G universities are not performing the support process well with evidence shown by the partially adequate of the definition dimension. C university showed absence in performing the support process with evidence of not adequate rating for the definition dimension.

**Management dimension:** B and E are performing the support process well and in some variables are less capable with evidence shown by the partially to largely adequate of the management dimension. D and to some extent H universities are not performing the support process well with evidence shown by the partially adequate of the management dimension. A, C, F and G showed absence in performing the support process with evidence of not adequate rating for the management dimension.

**Optimization dimension:** D and to some extent B universities are not performing the support process well with evidence shown by not adequate to partially adequate in most of the optimization dimension. A, C, E, F, G and H universities showed absence in performing the support process with evidence of not adequate rating for the optimization dimension.
4.4 Evaluation process:

Figure 8 presents the results of assessments of evaluation category; it includes three processes (E1-E3) that surrounding the evaluation and quality control of e-learning through its entire lifecycle.

**Delivery dimension:** A, B, D, E and H universities are performing the evaluation process very well with evidence shown by fully adequate and the strong capability of the delivery dimension. F university is performing the evaluation process well with evidence shown by the largely adequate of the delivery dimension. G and to some extent C universities are not performing the evaluation process very well with evidence shown of the partially adequate of the delivery dimension as they do not conduct a regular review of the e-learning aspects of their courses.

**Planning dimension:** D, E, H and to some extent B are performing the evaluation process well with evidence shown the largely adequate of the planning dimension. A university is not performing the evaluation process well, and C, F and G universities showed absence in performing the evaluation process with evidence of not adequate rating for the planning dimension.

**Definition dimension:** B, D and E are not performing the evaluation process well in most of the definition dimension with evidence shown by partially to largely adequate of the definition dimension as they have some standards, guidelines, templates and polices for regular review of the e-learning aspects of courses. A, F and H are not performing the evaluation process well with evidence shown of partially adequate of having standards, guidelines and templates during the process implementation. C and G showed absence in performing the evaluation process as they do not have defined or documented standards, guidelines or templates for regular reviews of e-learning courses.

**Management dimension:** B, D and E universities are performing the evaluation process well, they have documented standards for evaluation but without ensuring the quality of the regular reviews of the e-learning aspects of their courses. A university is not performing the evaluation process well with evidence shown of partially adequate of management dimension. C, F, G and H showed absence in performing the evaluation process as they do not manage the implementation process in order to ensure the quality of the outcomes.

**Optimization dimension:** All of the eight universities showed absence in performing the evaluation process with evidence of not adequate rating for the optimization dimension. As regular reviews of the e-learning aspects of courses are not conducted, furthermore, students and staff are not able to provide regular feedback on the quality and effectiveness of their e-learning experience.

4.5 Organization process:

Figure 9 presents the results of assessments of organization category; it includes nine processes (O1-O9) that associated with institutional planning and management.

**Delivery dimension:** A, B, D, E and H universities have strong capability as they are performing the organization process very well. F is performing the process well in most the delivery dimension
variables. C and G are not performing the organization process well with evidence of partially adequate rating in the delivery dimension.

**Planning dimension:** D is performing the organization process very well with the assessment of use of predefined objectives and plans in conducting the planning dimension. A, B, E and H are performing the organization process well with evidence of largely adequate planning dimension. F is not performing the organization process well with no assessment use of predefined objectives and plans. C and G showed absence in performing the organization process without predefined plans associated with university planning and management.

**Definition dimension:** D, E and to some extent H and A are performing the organization process well with defined and documented standards, guidelines and templates and they have explicit plan for e-learning initiative. B, F and G are not performing the organization process well with some documented standards, guidelines and templates but without an explicit plan. C university lack of guidelines and templates of any explicit plan for e-learning initiative.

**Management dimension:** D and E are performing part of the organization process well, they have some process implementation for ensuring the quality of the e-learning program outcomes. B and H are not performing the organization process well with no clear plan for ensuring the quality of the e-learning outcomes. A, C, F and G showed absence in performing the organization process without adequate process to be implemented in order to ensure the quality of their outcomes.

**Optimization dimension:** All the eight universities showed absence in performing the organization process with evidence of not adequate rating for the optimization dimension. As the universities do not follow explicit plan for e-learning technology decisions; and the lack of institutional strategies and operational plans.

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<tr>
<th>Dimension 1: Delivery</th>
<th>Dimension 2: Planning</th>
<th>Dimension 3: Definition</th>
<th>Dimension 4: Management</th>
<th>Dimension 5: Optimization</th>
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*Figure 7: eMM assessments of Organization category of 8 Jordanian universities arranged by dimension*

**5 CONCLUSIONS, RECOMMENDATIONS AND LESSONS LEARNED**

The research includes assessments of e-learning capability done in eight Jordanian universities using version (2.3) of the eMM (Marshall, 2007). These universities range from small to medium universities, three public universities and five were private.

Across the universities assessed, there is clear evidence that universities A, B, D, E and H are more capable than the remaining universities (C, F and G universities) in the five categories in (Delivery, Planning and Definition dimensions) as they had clear, well structured statements of learning objectives. However, there is very little evidence of capability in the management and optimization dimensions across all the universities assessed.

The lack of clearly managing process implementation and ensuring the quality of the e-learning outcomes, as well as a week using of formal and systematic approaches to improve the activities of the process to achieve pre-defined objectives is evident in the weaker capability assessed for the Management and Optimization dimension across all the universities in the sample.
It is recommended that all the assessed universities focus on the following aspects of Management and Optimization dimensions:

**Learning**: universities need to focus on managing and implementing the learning process to ensure the quality of the e-learning outcomes and increase the use of formal and systematic approaches to improve the processes that directly impact on pedagogical aspects of e-learning to achieve pre-defined objectives.

**Development**: universities need to focus on managing and implementing the development process to ensure the quality of the e-learning outcomes and increase the use of formal and systematic approaches to improve the processes that surrounding the creation and maintenance of e-learning resources.

**Support**: universities need to focus on managing and implementing the support process to ensure the quality of the e-learning outcomes and increase the use of formal and systematic approaches to improve the processes that surrounding the support and operational management of e-learning.

**Evaluation**: universities need to focus on managing and implementing the evaluation process to ensure the quality of the e-learning outcomes and increase the use of formal and systematic approaches to improve the processes that surrounding the evaluation and quality control of e-learning through its entire lifecycle, furthermore, universities need to implement a process to allow students and staff to be able to provide regular feedback on the quality and effectiveness of their e-learning experience and to conduct a regular reviews of the e-learning aspects of courses are conducted.

**Organization**: universities need to focus on managing and implementing the organization process to ensure the quality of the e-learning outcomes and increase the use of formal and systematic approaches to improve the processes associated with institutional planning and management. Furthermore, e-learning technology decisions should be guided by an explicit plan; e-learning initiatives in the universities should be linked to the universities’ development plan; and universities’ strategies and operational plans.

E-learning Maturity Model (eMM), has a number of benefits for the universities assessed, for example: it provides a road map for universities to improve their e-learning processes; it can also provide university management with the model necessary to guide long term institutional e-learning planning and change projects. Furthermore, eMM can help universities leaders assess their institution’s e-learning maturity in order to improve the quality of their e-learning investments.

References


