Roadmap to Advance E-Learning Management System at the University of Jordan

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Abstract: Research works in the field of e-Learning are represented by a broad spectrum of applications, ranged from virtual classrooms to remote courses or distance learning. E-Learning, via Web-based courses, offers obvious advantages for learners by making access to educational resources very fast, just-in-time and relevance, at any time or place. In this paper, we present a vision of e-Learning for higher education institutions in Jordan, in general, and for The University of Jordan, in particular. In addition, we propose an approach for developing e-Learning Strategic Plan for the University of Jordan particularly. The Plan provides a roadmap for the effective integration of appropriate Web-based educational technologies and services as well as e-Learning management systems to strengthen the teaching and learning missions of the University of Jordan, on-campus, between campuses, and online. This study also seeks to assist in developing plans, strategies and programs that support education reform for the knowledge economy and utilizing e-Learning systems in higher education sector in Jordan.
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1. Introduction

E-Learning can be defined as the use of information and communication technology to acquire knowledge and improve skills at times and on terms defined by each learner in an interactive and engaging environment (Tomasegovic et al., 2011). It can cover a spectrum of activities from supported learning, to blended learning (the combination of traditional and e-Learning practices), to learning that is entirely online.

Recent technological advances have laid the foundation for a learning revolution that will clearly take place in the years ahead (Pantazis, 2001). The administration of the University of Jordan (UJ) believes that e-Learning will play a vitally important role in equipping students with the skills they need to succeed in the 21st-century digital economy.

Many universities and institutions of higher education have recognized the value of the Internet in changing the way people learn. Traditional classroom courses can be augmented with interactive materials on the Web and old fashioned courses can be transformed into e-Learning environments. However, few institutions have been able to embrace e-Learning in a way that enables widespread innovative uses of educational technology throughout the institution. Instead, many rely on individual faculty or departments to make their own decisions about how to implement an e-Learning environment that best suits their needs. The result is a hybrid of incompatible solutions that make it difficult for faculty members to share their work. The lack of a centralized organizational technical support can also limit the use of e-Learning tools to departments that have technical expertise.

Any academic institution striving to obtain a successful e-Learning Strategy must be prepared culturally as well as technologically (Macpherson et al., 2005). Cultural factors have tremendous impact on how people learn, including the style of interaction and communication, constituting the core foundation of e-Learning. These strongly affect two main components of online learning systems: (1) System development and design and (2) System usability and acceptance (Saba et al., 2012). Cultural orientation must be considered in e-Learning environments to design and promote a successful system (Downey et al., 2005). One of the features of a successful e-Learning system is the involvement of users' cultural characteristics in its design (Edmundson, 2007).

The higher education has been traditionally recognized as the base for learning, technological innovation, and knowledge creation. Empowering this base with widened and lifelong learning capabilities better promotes innovation, intellectual capital investment, social and economic development, and education empowerment. Recent advances in Information and Communication Technology (ICT) have spurred an increasing interest in e-Learning pedagogy to widen access to learning among universities' students through the use of ICT (Ministry of Higher Education and Scientific Research, 2009).

Consequently, the Jordanian Ministry of Higher Education and Scientific Research (MoHESR) has formed an e-Learning steering committee to draft a national e-Learning strategy in 2007 to support institutions of higher education in their move towards embedding e-Learning appropriately using technology to transform education into a learner-centric system that is internationally distinguished in its quality and impact, and to foster innovation and excellence in teaching and learning.

This strategy presents the strengths, weaknesses, opportunities, and threats for adopting e-Learning in the higher education institutions in Jordan; it includes seven strategic goals:

1. To enable higher education institutions in Jordan to adopt e-Learning and facilitate widening access to learning.
2. To support higher education institutions in their strategic planning with a holistic approach to embedding e-Learning including implementation, administration, and change management.
3. To create a culture and awareness for e-Learning.
4. To establish a robust integrated virtual learning environment.
5. To assure the quality of e-Learning and its impact on students' teaching, learning and assessment experience.
6. To promote learning and educational technologies research that focuses on student learning rather than on technology and on faculty and staff development.
7. To lead the move towards instilling lifelong learning and enabling connections between academic learning and experiential learning (MoHESR, 2009).

With a bold vision of His Majesty King Abdullah II, Jordan has endeavored towards building a knowledge-based economy, where the generation and the utilization of knowledge will contribute significantly to an economic growth and wealth creation. Accordingly, the whole country undertook a real revolution with a determined political will. Government institutions have adopted new tools for enhanced productivity and educational systems have inspired new learning methods inline with new installment of advanced network connectivity and state-of-the-art technologies. A process is still needed to be introduced to guarantee that educational systems are continuously and systematically reviewed and developed to meet the demands of a fast growing and evolving technology sectors. This will require establishing an effective educational platform that closely links the process of learning development to the creation of highly educated and better-informed labor force empowered with new values, ideas, skills, and knowledge that will enable Jordan to become competitive in the global arena.

Multimedia technologies enable instructors and learning content providers to model and present many different kinds of information in dynamic ways that help people learn more rapidly and effectively by doing rather than observing (Asiri et al., 2012). In addition, by creating communities of learners, e-Learning can help learners share information in both formal and informal ways. Numerous studies have shown that students learn faster with electronic means; they more accurately recall what they learned over a longer period of time; and they are better able to transfer what they learned to actual performance (Alkhateeb et al., 2010; Alwi & Fan, 2010; Awouters & Jans, 2009; Martin, 2008; Wilson et al., 2000). Enhancing the quality of e-Learning so that these benefits are more widely available is thus a vitally important priority for the years ahead.

The economic case for building a successful e-Learning future hinges in part on the efficiency of e-Learning and its role in improving the quality of education. E-Learning also holds enormous potential as a tool for reducing the costs of continuing and workplace education. However, the cost of courses delivered through e-Learning is usually higher than that delivered through conventional teaching (Guri-Rosenblit & Gros, 2011). In addition, e-Learning holds the potential to broaden access to high-quality education opportunities and, in turn, prepare Jordanian students for the knowledge economy. The new economy places a premium on innovation, customization, new business models, and new ways of organizing work (Abuloum & Qablan, 2008).

Universities are recommended to adopt e-Learning to improve students' skills and teach them new ways of managing knowledge and information; they can be more productive, find high-quality jobs, be self learners, and have a positive impact on the success of their future employers, their families, and their communities (MoHESR, 2009). E-Learning can certainly help students and faculty members keep abreast of the rapid changes in technology, the sciences, and other disciplines. It provides access to just-in-time information, advice and performance support (Rahim et al., 2012; Anand et al., 2012).

Despite the fact that there are some cases of Faculty in Jordanian Universities carrying their own experiments and using trial and error to search for innovations to enhance their courses, these efforts are not matched with a large-scale institutional support and structure to move these initiatives from innovations to standards. There is a need to spread the culture of using technology to enhance the quality of learning. Also, there is a need to build a system that is

driven by instructional technologies that include design and development of components. The research finding on cognitive and instructional practices can guide the design and implementation of integrating ICT in education (Rehman and Saba,2012).

The goal of the e-Learning is to embed technology integration through the creation of 21st century learning environments where traditional assessment criteria and expectations are exceeded. Learning, not the technology, is the essential focus of any strategic plan, and for this to become a reality, the technology must be mobile when needed, ubiquitous at all times and functional to support all educational objectives. University administration should focus on what is needed to engage students and enhance learning experiences, not just on what hardware and software is available. Students should be encouraged to use mobile and other devices as well as online resources in a supportive environment that encourages responsible and reliable digital citizenship. All faculty members should be encouraged and supported in their efforts to embed emerging technologies with confidence. To be able to do these, essential conditions need to be established and supported (Al-Shboul, 2011).

E-Learning is playing a significant role in global higher education. According to MoHESR (2009), the following emerged as priorities that many academic institutions can best be addressed by large scale adoption of e-Learning technologies:

1. The vision of His Majesty King Abdullah II that "Jordan will become an Information Technology hub for the region" has been a rallying call to all Jordanians to pull together to realize His Majesty's vision for the future benefit of all citizens. Critical to the ability of Jordan to enter the knowledge economy is the preparation of the country's key advantage – its human resources.
2. Providing more access to higher education institutions by accommodating working people, women, and people with special needs. Increasing number of high school graduates will increase the number of students heading to universities and other higher education institutions with no space or capacity to absorb them. E-Learning will enable institutions to admit more students by re-engineering the university required courses based on technology.
3. Improving to the quality of student learning by expanding the learning experience through increasing engagement, interactivity, and communications. Courses with e-content stimulate student interest, get students more engaged and as a result deepen students' understanding and help them achieve higher order thinking skills. This will help in raising the performance in the University Achievement Exam to the international level.
4. Reducing the cost of instruction by reorganizing the formats and ways courses are offered and taught. Also, virtual environments, labs and knowledge sharing, and collaboration have contributed cost reduction.
5. Reducing the students to faculty ratio; e-Learning is perceived as a possible solution to address this symptom.

As a result, this study proposes an e-Learning strategy for higher education institutions in Jordan to build a solid e-Learning capacity in Jordanian universities and to make the emerging educational technology easy and effective. Figure 1 shows e-Learning technology of our framework.

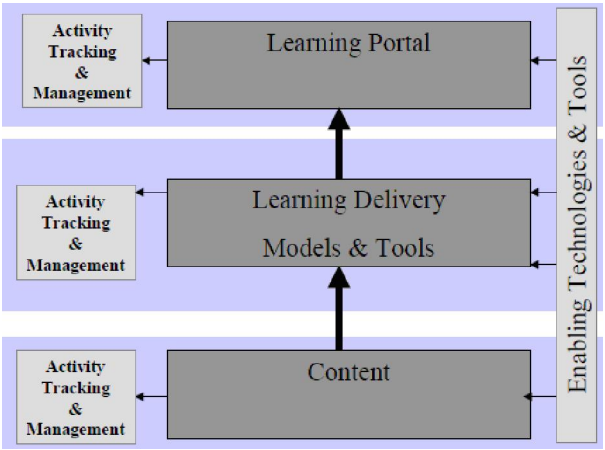

Figure 1. e-Leaning Technology Framework

In addition, in this paper, we propose a framework for introducing e-Learning in a traditional course, based on the experience derived from our personal involvement with the Web-enhancement of our courses via the e-Learning platforms. This framework will assist faculty members in higher education institutions in converting the structure of a typical face-to-face course into a Web enhanced one, following the rules of a well designed instructional model.

This paper is organized as follows: in section (2) we present some related work. In section (3) we give a brief overview about the University of Jordan and discuss a number of important issues related to the e-Learning systems and Web applications that are used in it. In section (4) we introduce our proposed e-Learning Strategy for Web-based e-Learning system within the context of the University of Jordan. In section (5) we describe the implementation of the

proposed strategy with an action plan. In section (6) we provide discussions related to the proposed strategy with some implications. The paper is finally concluded in section (7) with recommendations for future work.

2. Related Work

As instructors in educational institutions across the world experiment with technology, trying to take advantage of it in their courses, it is important to recognize that their role, as instructors, has remained essentially the same over the years: to educate and inspire students, and to offer them the means to build stable foundations for a successful future (Elarbi-Boudihir et al., 2011). While instructors can continue to be highly effective with the traditional lecture-style instructional method, a new technological resource, that of web-based learning management systems (LMS), is spreading out (Laurillard, 2002). Thus, our proposed model or strategy of applying e-Learning management systems in the institutions of higher education in Jordan suggests that e-Learning should be implemented gradually at the beginning to ensure a successful adaptation. In other words, we recommend to adopt a Blended Learning approach at first as shown in Figure 2; and then to move toward e-Learning approach partially or completely at later stages.

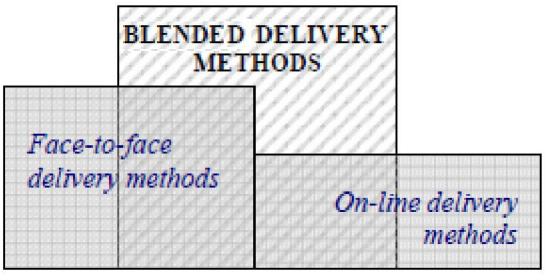

Figure 2. Conception of Blended Learning Model

Recently, several researchers studied the issue of Web-based learning and blended learning. One of the key issues for converting an existing face-to-face course to one based on technology is choosing the kind of blend to be used. A blend is an integrated strategy for delivering on promises about learning and performance, such as coaching by supervisor, participation in an online class, reference to a manual, participation in online communities etc. (Rosset et al., 2003; Rehman et al., 2009). The term *blended learning* is used to describe a learning format that combines several different delivery methods and also to describe learning that mixes various event-based activities, such as face-to-face classrooms, live e-Learning, and self-paced learning (Georgouli et al., 2008; Saba and Altameem, ,2013).

Georgouli et al. (2008) stated that options for blended learning go beyond the classroom; they can be formal and informal, technology- and learner-based, independent and convivial, and directive- and discovery-oriented. Also, options for blended learning involve a planned combination of approaches, such as coaching by a supervisor, participation in online classes, face-to-face tutoring, visiting websites, consulting manuals, attending seminars, workshops, and online communities.

Heinze and Procter (2004) have proposed the following definition for Blended Learning in higher education: Blended Learning is learning that is facilitated by the effective combination of different modes of delivery, models of teaching and styles of learning, and founded on transparent communication amongst all parties involved with a course. Figure 3 illustrates this definition.

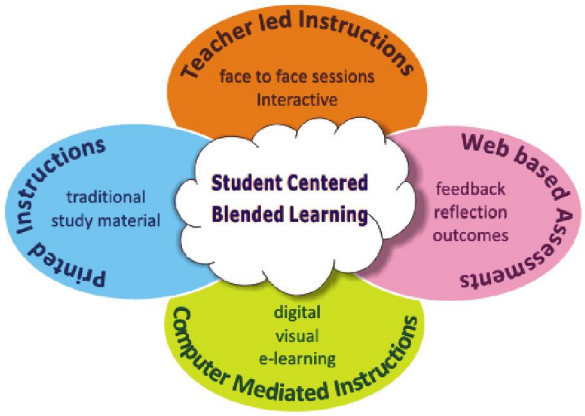

Figure 3. Blended Learning Approach

Harrison (2003) indicated that the starting point for the design of a blended learning conversion of an existing higher education program is the set of desired learning outcomes and the breakdown of the key learning points to be covered.

Many higher education programs are heavily classroom-based and contain large amounts of information that must be transferred to students. In this regard, Georgouli et al. (2008) pointed out that such programs can often be improved using delivery methods supported by Learning Management Systems (LMS), but information delivery does not have to be the only reason to use blended learning. Improving the quality of the learning experience, increasing the availability and accessibility of learning materials, and supporting collaborative activities are also important driving forces.

According to Voos (2003), there are two main aspects influencing the design of the blended learning: (a) the number of students having access to e-Learning technology at home; and (b) the effort required to upgrade the content in order to make it suitable for the online environment. Therefore, instructors using e-

Learning technology to enhance their courses should try to incorporate in their pedagogical model those learning factors that Information and Communications Technologies (ICT) boost particularly well and that are derived from educational technology research.

Ghaleb et al. (2006) indicated that e-Learning is not just concerned with providing easy access to learning resources, anytime, anywhere, via a repository of learning resources, but is also concerned with supporting such features as the personal definition of learning goals, and the synchronous and asynchronous communication, and collaboration, between learners and between learners and instructors.

Lee-Post (2009) demonstrated the applicability of an e-Learning success model to guide the design, development, and delivery of e-Learning through four action research cycles. A primary contribution of her research is in furthering scholars' understanding of how to define, assess, and promote e-Learning success. Lee-Post's e-Learning success model, as shown in Figure 4, proposes the use of an e-Learning success model to guide the design, development, and delivery of e-learning initiatives.

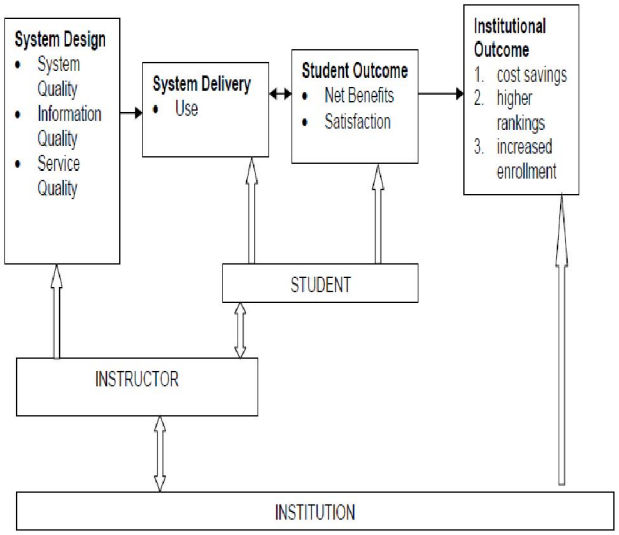

Figure 4. e-Learning Success Model (Lee-Post, 2009)

Thus, the validity of viewing e-Learning initiatives' development from an information systems perspective is supported by recognizing that these efforts are fueled by a common goal to harness new technologies to better meet the needs of their users. Lee-Post's e-Learning success model is useful for instructors to measure and evaluate e-Learning success; it assumes instructors are skilled system developers and enthusiastic e-Learning adopters.

However, in the case of the University of Jordan, Lee-Post's e-Learning model calls for institutional supports for instructors, in particular for those who are e-Learning skeptics. Some critical institutional supports include, first, a sound technical infrastructure such as campus-wide high speed Internet access, and institutional learning management systems like Blackboard or Moodle should be provided. Second, ongoing instructors' workshops should be organized to allow training and sharing of e-Learning best practices. Third, e-Learning developmental support in the form of technical and pedagogical aids should be established to facilitate instructors' e-Learning adoption. Fourth, technical support should be in place to address any issues that arise in e-Learning delivery and access. Fifth, incentives such as grants, awards and other forms of recognition should be placed to encourage e-Learning practices.

Lee-Post's e-Learning model also calls for an evaluation of e-Learning institutional outcomes so that the impacts of e-Learning can be assessed on the institutional level as well. Specific measures for institutional outcome can be cost saving, increased enrollment, higher rankings, increased endowment, etc. Lee-Post's model provides a more comprehensive view of e-Learning success – that students, instructors, and institutions all have roles to play (Lee-Post, 2009).

Fazlollahtabar and Abbasi (2012) explored learning management systems in e-Learning educational system; their study revealed that Learning Management System provides properties of an educational administrative system. Furthermore, they proposed a data flow diagram in an e-Learning system which plays as a decision aid for the administrators in the academic institutions. According to Fazlollahtabar and Abbasi, LMS has many benefits to the academic institutions such as manages learners and keeps track of their progress and performance across all types of learning activities. LMS also manages and allocates learning resources such as registration, classroom, instructor availability; monitors instructional material fulfillment; and provides online delivery of learning resources. LMS is a large Web-based software application comprising a suite of tools that centralizes and automates aspects of the learning process through the following functions: register learners; maintain learner profiles; maintain a catalogue of courses; store and deliver self-paced e-learning courses; download e-Learning modules and tools; track and record the progress of learners; assess learners; track and record assessment results; and provide reports to administration.

Pituch & Lee (2006) stated that the benefits of an e-Learning system will not be maximized unless learners use the system; they also indicated that whereas educational institutions have invested substantial resources in e-Learning systems, the benefits of such systems will not be realized if learners fail to use the system. Their study proposed and tested

alternative models that seek to explain student intention to use an e-Learning system when the system is used as a supplementary learning tool within a traditional class method. Additionally, based on e-Learning and information technology adoption literature and technology acceptance model (TAM) as shown in Figure 5, Pituch & Lee developed a model that integrates key constructs involved in e-Learning use. The constructs are (a) system characteristics such as functionality, interactivity, and response time (bandwidth capacity); (b) user characteristics, which means individual attributes related to technology usage and technical skills; (c) perceived ease of use and usefulness of the system, which impact intention to use a technology application; and (d) use of the technology, which means the user perceptions of the beneficial characteristics of the system.

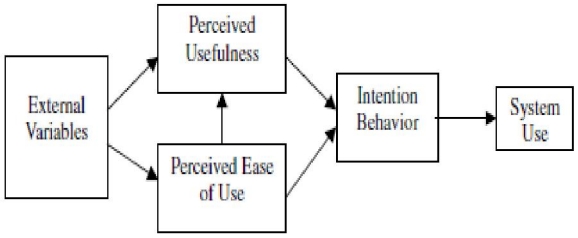

Figure 5. The Technology Acceptance Model

Salmon (2005) proposed an e-Learning strategy for higher education institutions in the United Kingdom (UK); he developed a strategic framework for e-Learning for the University of Leicester and pedagogical innovation in higher education institutions in UK. Salmon stated that academic staff are naturally reluctant to change their methods of teaching and learning without a deep understanding of why and how and what the impact will be in terms of quality and any resultant benefits. Furthermore, he indicated that most staff who are inexperienced in e-Learning initially believe that it is about technical 'solutions' rather than pedagogical innovation. Given the research imperative in most institutions of higher education, there are few direct benefits for academics to innovate in their teaching, and as such staff development and support are essential to promote and encourage uptake (Saba et al., 2011). To engage large numbers of academics, any approach must seek to ensure that ownership, not only of content but also of pedagogy, continues to lie directly within academic departments, but also recognizes that a wide variety of supportive mechanisms must underpin the continued developments.

3. Overview of the University of Jordan e-Learning

The University of Jordan (UJ) is both a modern as well as old leading academic institution of Higher Education in Jordan. Established in 1962, the University has, since then, applied itself to the advancement of knowledge no less than to its dissemination. Its emphasis is national, regional, and global learners' communities. UJ has 19 faculties, 2 deanships, and 15 centers in the main campus in Amman; in addition to 5 faculties in Aqaba branch in southern of Jordan. UJ offers 63 bachelor's, 81 master's, and 30 doctoral programs, in addition to 16 higher specialization programs in Medicine and one in Dentistry. UJ also offers one higher diploma program in ICTE, and 6 professional diploma programs.

In its capacity as a comprehensive teaching, research, and community-service institution, the University of Jordan enables its students to choose from a wide range of programs- more than 3500 different courses are offered by some 19 faculties. Given the global outlook, the progressive thinking, and diverse background, around 1628 faculty members shoulder the responsibility of delivering a quality education to the 36,400 students who currently are pursuing a wide variety of undergraduate and graduate programs. There are 2,295 international students coming from 63 countries (The University of Jordan, 2012).

All programs offered by the university combine traditional academic lecturing with the more liberal methodologies of instruction which are based on dialogue, research, problem-solving, and creative thinking. Theoretical instruction is further assisted with interactive multimedia teaching techniques and computer-based instructional materials to support, and eventually discard, traditional teaching methodologies. Field work, practical training, and applied research are essential components of most programs offered by the university. For sometime, UJ has been introducing and implementing the principles of Total Quality Management (TQM). With respect to Information Technologies, UJ is very well-positioned.

The University of Jordan took e-Learning and ICT-led development initiative in its vision since 2003, When the LMS was integrated into its information system; Blackboard in 2005 and Moodle in 2012. The UJ e-Learning initiative has four plans of action:

- The deployment of the necessary infrastructure and equipment for sparking the growth of e-Learning.
- Specific training at all levels and particularly for instructors, students, and administrative staff.
- The creation of the necessary conditions for the development of quality educational contents and services.

- Hastening the networking and cooperation at the national level. Figure 6 illustrates the UJ e-Learning Model.

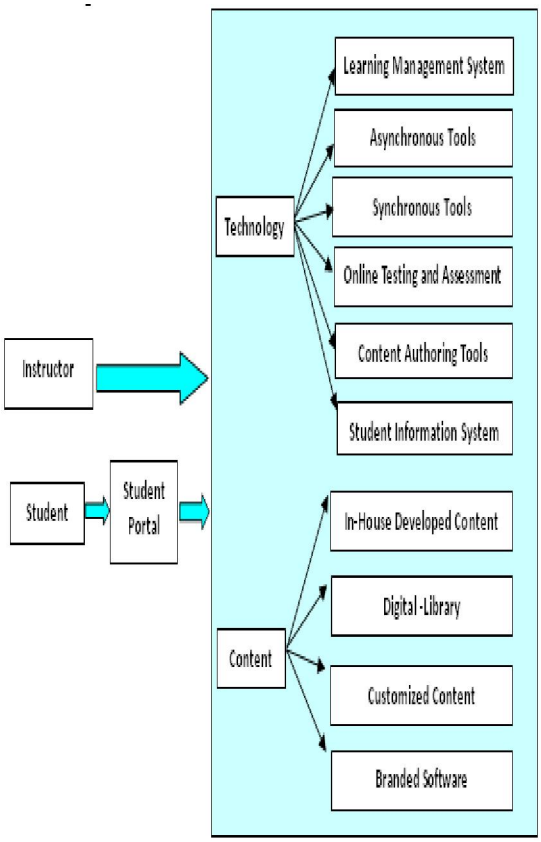

Figure 6. The University of Jordan e-Learning Model

Additionally, in terms of e-Learning and Web applications that are used by the university, UJ is typical of the traditional campus-based university keen to capitalize on the benefits of e-Learning, while also having to move to twenty-first-century online learning for some of its large-scale graduate programs. Preparing a strategic framework for the development of e-Learning at the UJ confirms that the university had recognized that e-Learning needed to be developed with appropriate pedagogical and learner-driven underpinnings. For this reason, the Deans' Council at UJ has established an e-Learning Office, which resides in King Abdullah II School for Information Technology, on November, 2012.

The move into the newly constructed e-Learning Office adds an exclamation point to this development. The renovation of classrooms and laboratories at the UJ campus and the learning center at UJ, are creating an environment where the infrastructure is now available to support the integration of e-Learning technology into classroom instruction. Moreover, the University of Jordan is placing an increased emphasis on online learning. Institutional initiatives have led to create online courses scheduled for 2012.

The University of Jordan has chosen the effective use of e-Learning technology as one means to ensure continuation of its traditional strengths in teaching and learning. This direction is made explicit in the University of Jordan Vision Statement for e-Learning: *University of Jordan embraces an e-Learning-centered approach with integrated technology, accessibility, and personal attention, resulting in quality learning and student success in a technology-driven future*. It can be noted that a vision is a statement of a desired future state. The purpose of the University of Jordan vision for e-Learning is to present a vivid and compelling direction for the Institution e-Learning plan that fits within the overall vision of the institutions (Saba and Rehman,2012).

However, in a 'teach-led old' university, dominated by campus learning in traditional subjects, the process of strategy development needed to be one of deep engagement of groups of administration and staff, academics, and support departments. Blackboard and Moodle are the two learning management systems already in use in some faculties on campus. There are well-established staff development and support process for use of learning technologies represented by the Computer Center, e-Learning Division specifically.

The existence of e-Learning Division located at the Computer Center, e-Learning Office located at Faculty of Information Technology, and Atheer Long Distance Center located at the Faculty of Educational Sciences reflect the University vision where it envisages an environment where the use of information and communications technology is regarded as an integral part of the university everyday practices and administration management. UJ acknowledges the potential of e-Learning to impact on learning outcomes for all students and the work habits of all staff. UJ e-Learning mission is to provide quality education that is accessible anywhere, anytime. Also to promote and support the effective use of technology in the curricula through improvements in existing programs and the creation of new technology opportunities for students, faculty, and the community.

For future expectations, the UJ is expected to:

- Continue training the faculty members in the university on the use of e-Learning management system.
- Contract and cooperate with international and regional communities in the field of e-Learning.
- Place a strategic plan for course delivery methods, from face-to-face courses in hybrid e-Learning to totally online courses for distance learning.

- Schedule courses to meet degree requirements for distance and off-campus learners.
- Create a distance learning program and associated courses which serves nationally and regionally.

4. Proposed Framework for e-Learning Strategy for the University of Jordan

In this section we will present our proposed framework for e-Learning Strategy for the University of Jordan. Initially, it is important to point out that the idea behind this proposed framework for e-Learning Strategy for the UJ is based on a previous work done by Dr. Al-Shboul when he conducted a workshop at the UJ in early September 2012; it was about e-Learning at the University of Jordan: A Vision and Thoughts to Improve its Deployment.

Our proposal (vision or approach) is that a suitable framework for an e-Learning strategy in universities in Jordan, specifically the University of Jordan, could be based on a 'resource-based' definition (Salaman & Asch, 2003) of the match that a university can make between its internal resources and skills, and the opportunities and risks created by its external environment (Salmon, 2005). Such a framework both implies identifying an individual institution's core capabilities and existing strengths (what it is good at, what makes it special), and how a strategy can take advantage of these in a competitive world (what it can do well and differently). A strategy based on those kinds of strengths would be more durable, and harder to imitate than 'off-the-shelf' strategies (Hamel & Valikangas, 2003) or those based on traditional market-led approaches (Salaman & Asch, 2003). Thus, choices of where to be innovative and where to increase the development of e-Learning should not be based on a bland view of 'market' but on a more complex view of the value of e-Learning meeting the university's mission and objectives as well as playing to its distinguishing institutional strengths (Richards et al., 2004; Rahim et al., 2011).

Our approach to engage others in the university with the e-Learning strategy addressed a number of key issues, outlined earlier in this paper. We would like to ensure that the model proposed took into account of the following:

1. The role for research into innovative pedagogy, linked directly to learning technologies.
2. The development of both core and peripheral learning technologies.
3. Realistic approaches to promote development for blended learning, especially in terms of student numbers and support.
4. An embeddedness in the university's overall aspirations, identified mainly through its existing formal plans and strategies but interpreted through formal and informal discussions.
5. The need to determine and make explicit the purpose of pedagogical innovation and the objectives of the scaling-up of e-Learning.
6. The importance of surfacing existing values in the university in a way that the best resources, projects, and motivations were preserved.
7. The strategy needed to sit within wider national frameworks and directions.
8. In the UJ context, faculty members in Faculty of IT, Educational Technology faculty members in Faculty of Educational Sciences, and developers and programmers in the Computer Center should team-up and work together when planning for and deploying the e-Learning at the university at an earlier phase.

However, innovation and change development in universities can never be a mere rational process (Jones & O'Shea, 2004). Developing e-Learning still involves considerable risk and opportunity costs, and few institutions have the resources to bet or a thirst for chancy ventures, and UJ was no exception while keen on pedagogical and quality development. The model developed as the basis of the strategy needed to be easy to understand and relate to at a variety of levels, while still offering opportunities to those with a taste for innovation. Given the huge pressure on all staff towards entrepreneurial, teaching and research activity, the strategy needed to have an element of 'enticement' and comfort about it.

While we were interested in the models of innovation such as Rogers (2003) and Somekh (1998), the linear process views appeared too simple to be useful as a framework for considering the complexity involved in e-Learning in higher education institutions in general.

As mentioned earlier, the e-Learning and pedagogical innovation Strategic Framework could be implemented gradually, by adopting blended learning approach, through out four stages:

- Stage one, represents the deployment of a university's existing core capabilities and capacity through incremental innovation.
- Stage two, suggests deployment of a university's key strengths in teaching excellence but with adjustments to new technologies.
- Stage three, suggests deploying the understanding of technologies already in place to promote business development, solve problems and increase quality of all kinds.

- Stage four, represents a more radical view of change using peripheral technologies, new LMS products and new implementations and missions related to e-Learning utilization.

Our proposed e-Learning Plan provides directions, management goals, and strategies within the context of this changing environment. It sets the direction for the development of e-Learning and supporting technologies and services within the institution. Several strategic goals emerged from the proposed e-Learning Strategy:

- Use a fully functional e-Learning Management System with clear and easy access to all institutional programs and services.
- Build partnerships to ensure that University of Jordan e-Learning programs and services meet the needs and appropriately utilize the resources of the community.
- Provide faculty development opportunities to enable faculty to work more effectively with technology in an e-Learning environment.
- Provide academic and technological support to enhance student learning.
- Establish appropriate governance, planning and management structures, and procedures to ensure successful acquisition, implementation and support of e-Learning technology district-wide.
- Provide necessary hardware, software, and infrastructure for faculty, staff, and students.
- Provide fully accessible, interactive, online library services and resources.

5. The Implementation of the Proposed Strategy

To achieve a successful implementation of the proposed e-Learning Strategy, four stages should be utilized.

Stage One: Suggests achieving growth with established *core* technological products and processes such as LMS and e-libraries, embedding them further into teaching and learning processes and using them for increasing numbers of purposes and students. Here is the gradual evolution from campus and/or traditional paper-based traditional learning to pedagogically sound e-Learning.

Much can be achieved by deploying 'off the shelf' technologies such as commercial LMS but they require careful institutional planning, investment in staff development and support, and excellent provision of ICT within university systems. They also require astute planning of mission, objectives, student requirements, and the resources for the support and development of the technology.

The university should first identify and target those areas where there is potential for growth, rapid improvement in quality or efficiency gains. The aim can be to move more of its regular learning into the e-environment but in a way such that will enable it to pilot transferable or scalable processes. To start with, the focus can be to further develop communication and group teaching in the online environment, rather than from print to online resources. At a discipline level, there is a potential to provide free academic courseware or learning objects that can be shared, versioned, or reused (Mason et al., 2005). Content is usually not viewed as a major differentiator by potential students: value lies in brand, support, group teaching, peers, and communication.

Personalization and choice based on learning needs is the first step away from the limitations inherent in printed texts, and face-to-face classrooms. As access to a wide range of resources becomes easier, and as the number of resources multiplies, it will become more possible to tailor access to the needs and interests of the individual learner while avoiding loss of economies of scale.

In this stage the university will be able to 'keep up' with the increasing uptake of e-Learning and offer acceptable online learning to students. The university will then be in a good position to expand into new locations, respond to funding opportunities, and into new types of courses.

Stage Two: This stage addresses many new learning and mobile technologies now available. However, most of the newer widely used technologies such as Smart phones, I-Pods, and GPS applications have not been developed for learning and need good understanding of potential teaching applications to be successful in new contexts. These technologies are currently considered peripheral. Some, however, may become core in the near future.

The implications of wireless networking are that, because content and communication is available anywhere, learning is no longer tied to a particular location. As more standardized encoded and syndicated content delivery becomes readily available, there will be little, if any, limitation on the place or manner in which learning may be available.

Many new technologies are appropriate for off-campus use, as combinations and blends, for dynamic delivery of content and for human intervention and support of online learning. There are new understandings of the use of knowledge creation, sharing and repositories that can be deployed. Many technologies can be channeled through the virtual learning environments or learning management systems.

Pedagogies in this stage need more exploration. Clearly small-scale pilots need to be

undertaken that focus on the changing nature of pedagogy, rather than rampantly developing more and more technological features. In this stage, the university can be confident in offering small-scale pilots with existing students, with a view to developing appropriate e-Learning pedagogy through evaluation, feedback and research. Staff development and new systems and processes will be necessary for scaling-up of offerings.

Stage Three: This stage represents using learning technologies to address *different* and *new* missions, levels and disciplines of learning and teaching but using the core expertise and technologies already developed. Realistic approaches must be taken into the consideration to reduce risks as far as possible. As e-Learning depends on volume, there should be a minimum contracted commitment before new e-Learning processes are developed.

Learning objects—a piece of digital resource, broken into small reusable chunks, that can promote learning—clearly fit into this stage, as they can be used in a wide variety of circumstances. Similarly the use of personal repositories, wikis and blogs can be a system for managing and sharing both pedagogical and content knowledge across a wide range of new missions.

There is an opportunity in this stage to use Web-based technologies such as LMS to enable 'joining up' of e-resources across the university community to enable students to make stronger and easier connections between the subject areas they study and the services they can use. An aspiration for this stage could be to ensure that every student of a university, regardless of location or mode of learning, receives equivalent services and learning experiences.

Stage Four: This stage is the most challenging, risky, and potentially rewarding. Research projects about e-Learning are being published that go beyond the simplistic 'what works' scenarios of stage one of technology introduction. They need exploring and bringing together into usable principles and understandings along with appreciation of their transferability into teaching and innovation in a university. This stage offers the greatest potential to successfully put a university on the e-Learning map.

Clearly the technologies here will be peripheral but the research will position the university well for developing local expertise, capabilities and competencies should they become core in the future through diversification. The university should allow new strategies to emerge to support an assessment of effective directions and the associated risks.

Engagement with this stage will require the university to continually scan the technology and develop one or two innovative projects or seek several smaller ones using peripheral technologies.

Consequently, a second objective of this study is to examine the applicability of an information systems success framework to e-Learning initiatives' development and assessment.

The value of using the proposed framework for e-Learning Strategy could be demonstrated using an action research methodology. Action research was introduced by Kurt Lewin in the 1940s to study social psychology and social changes at the University of Michigan's Research Center for Group Dynamics (Lewin, 1947). Lewin's work established the reputation of action research as a "science of practice" that is best suited for studying complex social systems by introducing changes into practice and observing the effects of these changes (Argyris et al., 1985). The fundamental contention of action research is that complex social systems cannot be reduced for meaningful study. As a result, the goal of action research is to understand the complex process rather than prescribing a universal law (Baskerville, 1999).

The complex nature of learning is summed up eloquently by Meyer (2002): *The problem with most research studies on learning is the difficulty of isolating factors so that their impact (if any) can be identified and understood, separate from the action of other factors in the environment. Unfortunately for researchers, learning is both complex and occurs in very rich environments. It is doubly difficult to unravel influences from the individual's personality, values, brain, background (family, school, friends, work), and, of course, the educational environment (classroom, teacher acts, pedagogical choices, tools) (p.24)*.

Consequently, action research can be lent well as the methodology of choice to a future implementation of the proposed strategy that is suggested by this study. Following the spirit of action research, this study recommends adopting an iterative process involving five phases to gain understanding of how to enhance e-Learning success for such future implementation and assessment: diagnosing, action-planning, action-taking, evaluating, and learning (Susman & Evered, 1978). The diagnosing phase identifies impediments to successful e-Learning initiatives so that measures to overcome these impediments can be developed in the action-planning phase. The action-taking phase then carries out the measures developed. The evaluating phase examines resulting changes from the actions taken to assess their impact on the success of e-Learning Strategy. The learning phase assimilates lessons learned and experiences gained towards a better understanding of e-Learning success at the UJ. These five proposed phases, which are recommended by Susman & Evered, of action research could be applied to this study in the future if the university decided to adopt the proposed

strategy; the five proposed phases are illustrated in Figure 7.

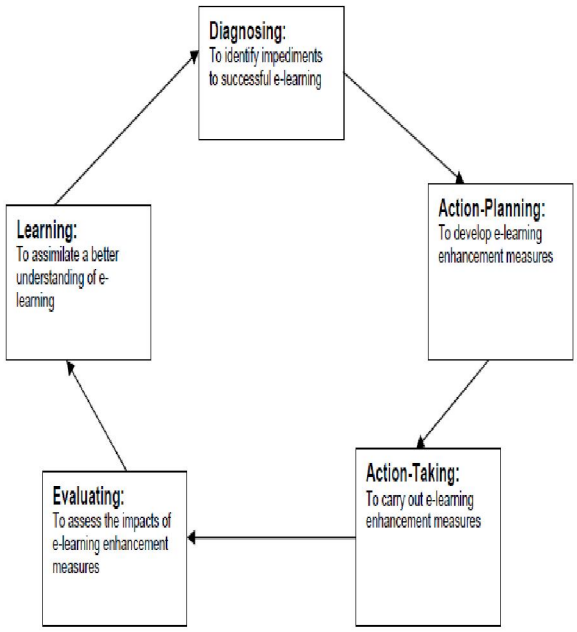

Figure 7. The Five Phases of Action Research (Susman & Evered, 1978)

However, planning process (action plans) for the proposed e-Learning framework at the University of Jordan is not a one-time event; it must be seen as an ongoing process because it is occurring in this dynamic and changing environment. Finally, the plan of actions must include the identification of individuals and groups who will take responsibility for the implementation of the goals, strategies, and objectives stated in the proposed plan.

The e-Learning planning approach that is suggested for use at University of Jordan from the proposed framework could be implemented by the following steps:

- Development of a vision of how e-Learning should add value in support of the University's vision, mission, and goals.
- Identification of the current state of e-Learning that will impact the University's approach and implementation of e-Learning.
- Development of guiding principles that should govern the decisions and actions of the University.
- Development of planning assumptions that detail the environment in which the University implements its e-Learning plans.
- Development of goals and strategies to enable the University to move forward toward its vision for e-Learning in alignment with its overall vision, mission, and goals.
- Development of an implementation plan that charts the responsible parties and timelines for completion of the University's e-Learning goals and objectives.

6. Discussion

Our study demonstrates the value of proposing and assessing e-Learning Strategy from an information systems perspective at the UJ. Specifically, the following observations, based on our teaching experience in online courses, are made from the development and continual improvement in designing, developing, and delivering the online course.

- The first step to ensure successful development and delivery of e-Learning initiatives is to understand students' learning needs and attitudes towards e-Learning through pilot studies. In doing so, issues in designing and developing e-Learning initiatives can be identified and addressed adequately before their actual delivery.
- A critical factor of e-Learning success is the online readiness of the students. Online readiness should be assessed along four readiness measures: academic preparedness, technical competence, lifestyle aptitude, and learning preference toward e-Learning.
- The overall success of an e-Learning initiative is dependent on the attainment of success at each of the three phases of e-Learning systems development, namely, system design, system delivery, and system outcome (Lee-Post, 2009).
- The success of the system design phase is dependent on the attainment of three success factors: (1) system quality; (2) information quality; and (3) service quality.
- The success of the system delivery phase is dependent on the attainment of success of the system design phase and one success factor: use.
- The success of the system outcome phase is dependent on the attainment of success of the system delivery phase as well as two success factors: (1) net benefits; and (2) user satisfaction.
- An action research methodology is an impetus for success dimension improvement. Rather than attacking the research issue in its entirety at the outset, action research encourages organizing the issue into manageable cycles. Findings from these cycles then converge to a full understanding

of the issue itself and how it should be addressed.

- A common interface allowing a seamless access to all course design elements is an important system design feature.
- Success criteria that are relevant to a specific e-Learning context should be defined and quantified to a desirable target level of performance. For example, the user satisfaction success criterion is defined as the students' opinions on e-Learning. It could be measured by two indicators on a Likert-scale: (1) the overall value of the course; and (2) the overall quality of teaching.
- Course improvements should be made by following a process approach to systematically raising the three quality ratings in the design phase first and proceed to boosting the use rating in the delivery phase, then followed by improvements in the user satisfaction, and net benefits ratings in the outcome phase.
- Institutional supports are critical to promote and facilitate e-Learning adoption among instructors.
- Institutional outcome should be measured to encompass an institutional perspective.

The framework that resulted in the development of this proposed e-Learning Strategy for the University of Jordan could be collaborative and enabled the University systematically to look at how to improve the teaching and learning process through e-Learning and the technologies, services, people, and processes that support it. In order for the proposed e-Learning framework to be truly successful, the University of Jordan must be able periodically to turn the goals and strategies of this proposed plan into concrete actions. The plan's list of objectives provides the first attempt to do this.

Moreover, for the proposed e-Learning plan to remain current and useful, it will need to be reviewed periodically. The planning assumptions and the University accomplishments should be evaluated against the proposed plan, with modifications made to the proposed plan and its implementation as appropriate.

Finally, the implementation of the proposed e-Learning Strategy is a University choice and responsibility. It should be monitored by an e-Learning Committee, which strongly suggested to be formed, to oversee the implementation of the infrastructure required to support the e-Learning Strategy.

7. Conclusion and Future Work

E-Learning systems have become popular tools for teaching and learning; e-Learning has grown significantly over the last decade to become a significant mode of instruction in higher education (Curran, 2004). Advanced e-Learning systems, such as Blackboard, Moodle, and self-created Web-based open source tools have been developed recently that integrate a variety of functions (Pituch & Lee, 2006). For example, these systems can be used to integrate instructional material (via audio, video, and text), e-mail, live chat sessions, online discussions, forums, quizzes and assignments, and the World Wide Web. With this kind of system, instructional delivery and communication between instructors and students can be conducted at the same time (synchronously) or at different times (asynchronously). Such systems provide a variety of instructional aids and communication methods, and offer learners great flexibility as to the time and place of instruction. As a result, these e-Learning systems may better accommodate the needs of learners who are geographically dispersed and have conflicting schedules. Given these advantages, it is not surprising that educational institutions are making substantial investments in e-Learning systems. Hence, this study proposed an e-Learning Strategy for higher education institutions to establish a cornerstone for any development program regarding e-Learning adaptation and utilization in academic settings.

This research moves the learner and instructor a step closer in harnessing the power of Internet-based technologies to enhance learning. We demonstrated the applicability of an e-Learning Strategy framework/model to guide the design, development, and delivery of e-Learning through four proposed stages combined with recommended blended learning approach. A primary contribution of this research is in furthering our understanding of how to define, assess, and promote e-Learning success in educational environments. To this end, success in e-Learning is defined as a multi-faceted construct that can be assessed along six dimensions including system quality, information quality, service quality, use, user satisfaction, and net benefits occurring in three phases (Lee-Post, 2009). The first phase is to attain system design success by maximizing the three quality dimensions. The second phase is to attain system delivery success by maximizing the use dimension. The final phase is to attain system outcome success by maximizing net benefits and user satisfaction dimensions. Each success dimension is quantified as a single numeric measure by aggregating the ratings of its set of attributing factors obtained via a course evaluation survey instrument. The overall success of e-Learning can then be evaluated for each dimension. A low score for any success dimension signifies a deficiency in that area and efforts can be devoted accordingly to rectify the deficiency.

The proposed e-Learning Strategy and pedagogical innovation framework for the University of Jordan provided an appropriate platform for the hundreds of formal and informal discussions needed to develop an e-Learning Strategy for the university. The strategy could be adopted by the University at a gradual level. As we introduce our proposed vision, implementation has commenced and evaluation processes are in place. We offer the framework here for feedback, critique, and exploration by others. We hope that it will provide an example of an attempt to capture the complexity of developing and implementing an e-Learning Strategy and that it will contribute to the understanding of change processes in higher education institutions associated with the introduction of ICT in learning and teaching process. New approaches are so much needed if e-Learning is to succeed in becoming successfully embedded in higher education institutions to the benefit of learners and faculty members alike, and within a climate of promoting e-Learning and teaching research.

Furthermore, this study corroborates the well-established importance of the belief constructs. That is, the perceived ease of use of the system influenced the perceived usefulness of the system, and both belief constructs were important determinants of e-Learning system use. As an e-Learning system should be perceived as both easy to use and useful to maximize use of the system, faculty members, when feasible, should demonstrate use of the technology and/or provide instructional materials that would ease student learning of the technology. In addition, this study suggests that faculty members should describe how the technology will benefit students and help them learn course content or achieve other learning goals, as students who perceived that the system would help them learn expressed a greater intent to use the system.

Given the increasing use of e-Learning systems, a better understanding and implementation of effective system characteristics will enhance the use and educational value of such systems. Therefore, this study concludes and suggests that developers, designers, and institutional purchasers of e-Learning systems carefully consider the needs and values of system users and ensure that the system characteristics in question effectively meets these demands.

E-Learning technology activation within the University of Jordan needs determination of requirements of applying e-Learning. They can be divided into three categories.

Infrastructure: (a) Software or programs such as e-Content production programs; Learning Management System; lectures recording and re-broad casting systems; virtual classroom systems; and Web Portals. (b) Hardware such as virtual labs; audio and video conferences; and e-Courses developing and producing laboratories.

E-Content production: (a) Content development team includes: Graphic Designer; Graphic Developer; e-Content Developer; Instructional Designer; Project Manager; and Subject Matter Expert. (b) Center organizational structure. (c) Project Coordinator.

Training the university staff to deal with e-Learning: Includes training for all the university staff (faculty members, students, and administrators) in order to cope with the new concept of e-Learning; this training will be for a limited number of the university staff, those who have experience in this field so as to be the basic element for training the rest of the staff.

In summary, the UJ proposed framework for e-Learning Strategic Plan will be valuable for implementation of technology-based change as well as for planning for applying Blended e-Learning approach at the University of Jordan. The proposed e-Learning Strategy can serve as a useful vehicle for actions when utilizing Web-based technology in academia. The proposed strategy may be transferable to contexts in other universities in Jordan.

In short, the proposed e-Learning Strategy framework for the institutions of higher education in Jordan can be applied to different disciplines and to undergraduate and graduate level of courses as well. However, since this study represents a proposed strategy for institutional level, there is a need to broaden the current student-centered perspective; therefore, for future work an extended e-Learning success model is desired to give recognition to the role that students, instructors, and institution play in making e-Learning a success experience. Additionally, future testing and validating of the proposed e-Learning Strategy framework will be beneficial to the continued growth of this important research area.

Lastly, e-Learning in the public universities in Jordan is just an electronic tool that support the traditional way of learning which depends on face-to-face learning. Therefore, for future work, in order to support the exchange of information about e-Learning and build on the experiences of different Jordanian academic institutions, an online survey is recommended and needed to understand what is being developed and implemented in terms of e-Learning activities, capacities, and infrastructure. To gathered information on how e-Learning is perceived and implemented at Jordanian academic institutions, the suggested survey will need to cover the following topics: e-Learning and networking, e-Learning activities, and strategy and policy for e-Learning in Jordan.

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