

Assessing Information and Communication Technology in Jordanian Universities

Hisham, Mobaideen, School of Information Management, Leeds Metropolitan
University, UK
H.Mobaideen@leedsmet.ac.uk

Abstract:

Technology can be considered today as a key factor for successful development in all industries. After the emergence of Internet and computer-aided educational programmes, teaching institutions have changed enormously in the way of providing education and training. Higher education is an 'information intensive industry'. There is a provision of the changing qualification required by the workforce and how higher education should cope with the changing role of information and communication technology for individuals, organizations and society. There is high demand by governmental and private sectors for new universities educational programmes that cover the new technology developed for use. For instance, hospitals nowadays recruit qualified staff, who graduates from technical teaching programmes at the universities. The same for factories which require professional employees qualified in using the latest technology.

Traditionally, a key use of ICT in support of teaching and learning has been computer-assisted learning. Some universities have set up special units to support teaching staff in the development of packages but others have ignored these developments

Universities are changing the format of lectures from conventional open materials to virtual lectures. Virtual lecture materials are designed to be multimedia packages. The online courses can then be made available to continuing education students worldwide who are interested in enhancing their knowledge, skills and abilities in international business management, marketing and finance, and all other areas.

Jordan, as an example of a developing economy, was selected because of the country's vision for the future of education and its people; to build a knowledge economy, encourage, entrepreneurial actions by its citizens, and to participate in the information communications ICT

Keywords: Information and communication technology, Jordan, E-learning

1. INTRODUCTION:

The acceleration of technology pressures higher education institutions [HEIs] to provide learners with technological skills (Fung, 2001). Technology can be considered today as a key factor for successful development in all industries. (George and King, 1991). Traditionally, a key use of ICT in support of teaching and learning has been computer-assisted learning. Some universities have set up special units to support teaching staff in the development of packages but others have ignored these developments. Higher education institutions HEIs, like other forms of organisation, have continually to re-assess their adoption of ICT. In addition to this, they must take into account how best to support teaching and learning for students and staff. ICT resources became a competitive weapon; this may mean changing the modes of studying through the emergence of the Internet which resulted in the birth of online education as another form of distance learning (Bell and Dallinga, 1994). The real educational value of the internet lies in the potential to bring about new forms of distance interaction. The internet changes the meaning of distance education that distance education existed long before the internet or even computers (Trentin, 2002), many universities teach some degrees online, and this process makes it feasible for students to attend online sessions through connecting to the universities' intranets.

ICT plays a main role in enhancing students' mobility, delivering information to provide broader access to knowledge. If we are concerned to predict the future we should get in, universities in the future are going to be completely different. (Fung, 2001)

There are many types of universities all over the world; different countries have different educational policies, but in general the move is to make the student pay-either before or after study. And many countries have a mixed model of HEIs-public and private. Public universities still in many countries sponsored by the governmental policies in which the cost is paid out of general taxation and external aid funding and donations mainly for capital development, technical assistance and staff training (Romero and Rey, 2004), While private universities fund themselves from own resources. There is call for sharing the financial base from students through tuition fees (Gabriel, 2003)

'The new competition in the educational market place has forced institutions to be more focused and competitive as they attempt to recruit these potential students, and if the information is not readily available to decision makers, the institution will struggle in defining its customer base, service area, core competencies, and other aspects necessary for an integrated marketing plan.' (Guan, Jeff et al, 2002)

Many countries in the third world are trying to follow western universities methods in teaching and learning, and dealing with daily routines using ICTs tools and materials to develop, and sustain the quality of educational systems in a globalized world.

HEIs from time to time try to develop programmes with effective integration and utilisation of ICT in their multidimensional functions and stimulate academics to explore opportunities posed by ICT much more or these institutions will be behind (Potgieter and Herselman, 2003) HEIs are now recruiting students globally – well some of them are; ICTs are critical in doing this; students now pay for themselves, and so government control of where they study is weakened; HEIs are therefore potentially competing with each other across the globe – and so within developing economies there is a possibility that HEIs from developed countries will cream off the best students.

Considering that Jordan is a developing country, with middle economy, higher education institutions technology acts to facilitate rapid interconnectivity between places that can be seen to collapse time and space differences. So in order to survive Jordan should follow up with these advanced technologies, So, Jordan could simply decide to subsidize students who go to Jordanian HEIs, or make the HEIs more attractive to students nevertheless it will no longer be isolated. (Al jaghoub and Westrup 2003) Very recently, Jordan has witnessed a revolution in bringing in information technology since the year 2000. To be fair, however,

financial and banking institutions have been keeping up with technological developments though partially sometimes, considering that most of them are branches for international and regional financial institutions and centers. Therefore, such branches must follow in integrating such services in order to be able to compete. So, 'distinction should be made among the three different uses of ICT in higher education, (1) learning about ICT; (2) learning with the aid of ICT (software tools), and (3) learning through ICT (courseware). The first point requires adequate technical infrastructure, especially in software. The first and second points combined would enable students and staff to have easy access to databases, search systems and the like. Point three relates directly to the learning process itself; it requires much greater self-reliance from students' (Hopkins, 1996, p. 8).

Jordan is an example of a country that has made a conscious decision to build a k-economy, Jordan was selected because of the country's vision for the future of education and its people; to build a knowledge economy, encourage, entrepreneurial actions by its citizens, and to participate in information and communication technology ICT. Here we are trying to ask if the higher education institutions (HEIs) in Jordan set to accept technology. What they have achieved so far and their future plan.

The contribution of my research will be:

- 1) Assessment of the current use of ICT in the Jordanian universities.
- 2) Developing a model for critical success factors for implementing ICT in HEIs.

2. ICT in Higher Education in the 21st Century

Recently, universities and other HEIs all over the world as well as learners and researchers, have devoted a considerable attention to the systemic use of computer networks for in-service training and, more generally, lifelong learning education. (Trentin, 2002) That nothing can work smoothly unless advanced technology is employed in the daily work and correspondences with others in the same institution as well as other institutions. In this respect, a number of possible approaches have been conceived, developed and tested. The real educational value of the internet lies in the potential to bring about new forms of distance interaction.

To describe the increasing use of ICT in the world, there are many terms besides the virtual and distance learning, online learning, defining themselves as virtual 21st century organizations.

One of the most successful uses of online programmes in research –based learning has been in courses where assessment has been flexible and takes place alongside the learning using the same online environment. Development in assessment for online and open learning environment is still a new territory with many features like being open, informed, dynamic, carefully, constructed, cumulative, and preserved. This may provide an equally useful guide for assessment of student work in relation to research capabilities. (Dempster, 2003) The uses of ICT offer the opportunity to reduce costs, or add value to enhance the quality of the project and programmes. (Farrell, 2000) moreover, internet interactive searching now is open to wide audience and considered in the framework of communication and culture transmission. (Iivonen and White 2001)

“As we move into the 21st century, these factors and others are bringing strong forces to bear on the adoption of ICTs in education and contemporary trends suggest we will soon see large scale changes in the way education is planned and delivered as a consequence of the opportunities and affordances of ICT”. (Oliver, 2002.p2)

3. New types of educational systems

The expectation in the 21st century led the directions and attitudes in the educational sector to be changed completely, learning and teaching transforming to become a business deals exploiting the human capital in the global world. To retain viability, universities will need to adapt their offering in order to attract students who can, literally, pick and choose learning packages from across the world. (Allen *et al*, 1997)

“Genuine distance education institutions and virtual universities have strategically adopted organizational, instructional and technological approaches for online learning”. (Molz *et al*, 2002 p46),

“E-learning is internet- enabled learning” (Gunasekaran, *et al*, 2002. p46)

(Sridhar, 2005) gave us a good definition for E-Learning “extend to digital collaboration, communities of interest, information and knowledge sharing”. (Sridhar, 2005 p258)

E-learning is learning through the internet. It is another name of online learning and one of the types of distance learning. It takes the format of computer-to-computer communication through a web site which is updated periodically, which from learning materials can be obtained.

“Online technologies are as much about communication as they are about information access and this creates a powerful combination in the context of learning”. (Sridhar, 2005 p258)

It’s true that one of the most benefits of online programmes lies in their potential to support styles of learning that is especially time-intensive for university teachers using traditional methods. Success is often evaluated on the basis of adoption rather than pedagogical viability and the educational benefits therefore remain unclear or dubious. (Dempster, 2003)

Using technology in the classroom and designing effective distance learning courses including technical support and course content can enhance students’ academic experience (Levy, and Murphy, 2002)

Distance learning is learning without bounds to place or face-to-face communication between teacher and learner. It can be done by many methods including TV, Radio, Internet and other technological means. It does not require full attendance in the teaching institution.

Universities are changing the format of the lectures from conventional open materials to virtual lectures. Conventional open learning materials are paper-based text books. While virtual lectures materials are designed multimedia packages. Virtual lecture makes use of text, images, sound video and interactivity to enrich the learning experience. The virtual lecture can be distributed on CD or made available over the Internet. This provides the characteristics of open learning: flexibility in location, time and pace. This is what is meant by virtual university (Evans & Fan, 2002). Other aspects of virtual university include virtual exams which allow students to gain feedback in their performance through instant computer-based assessment, virtual seminars which serve the functions of facilitating learner interaction by allowing the student to ask the tutor questions about the virtual lectures through an electronic discussion board (Evans and Fan, 2002) and virtual library which takes the format of digital books, journals and other e-resources (Siriwongworawat, 2003).

Virtual education passed through many uses generations, and finally, automated response systems that scan the text of incoming E mail and respond intelligently without human intervention. (Vitangcol III, 2002)

Virtual university allowed students to allocate in different places from the learning media and the instruction team, and they can access learning materials at any time.

4. ICT in HEIs in The developing countries

Many countries in the developing countries are trying to follow western universities methods in teaching and learning, and dealing with daily routines using ICTs tools and materials to develop, and sustain the quality of educational systems in a globalized world. In Africa the Association of African Universities tried to assess how African Universities are facing the challenges of using ICTs to build a pathway to the global information revolution, to improve their teaching methods, enhance learning, strengthen research functions, and manage library and other academic information services, to produce graduates endowed with high level skills in the new competitive global economy. The studies done in Africa identified a number of common obstacles to utilization of ICTs in African universities as follows:

External obstacles: lack of enabling environment, absence of national information and communication infrastructure policy, and high internet services providers (ISP) fees.

Internal obstacles: lack of strategies and plans, and absence of integrated ICT policies. Human resources-related obstacles: no trained technical and supported staff, absence of plans for integrating technology into teaching and learning. In addition the financial resources and uncertainty of donor funding may be the most daunting obstacles to the aspirations of African universities to become active players in the global knowledge revolution.

So every institution should be able to assess its current situation with regard to its capacity to use ICT in teaching and learning, research outreach and professional services, as well as to achieve internal administrative efficiency. Association of African Universities; www.aau.org/english/documents/ICT-guid.pdf

ICT are having impact on development in two ways: first it can directly enhance human capability. Second, ICT can affect development as a result of their impact on economic growth. And provide access to information that can create earning opportunities, increase the impact of education. (Al jaghoub and Westrup 2002)

5. In Jordan, however:

Considering that Jordan is a developing country, Jordan has suffered from keeping up with the tremendous and accelerating developments in information and communication technology (ICT) emerging from natural renaissance in all areas emphasizing, therefore, that information and communication systems (ICT) are an aspect resource, and an essential part of the organization resources.

In response to a challenge posed by His Majesty King Abdullah II early 1999, Jordan's private Information & Communication Technology (ICT) sector has tried to become a major contributor to Jordan's economy. The ICT higher education has played a major role in fostering the ICT business through establishing linkage and enhancing collaboration to better serve the sector's needs and help to develop a knowledge-based economy.

<http://aece.yu.edu.jo/ict/summary.htm>

“During the past two decades, the role of institutions of higher education in society in Jordan has fundamentally changed. Universities no longer have an exclusive franchise as the primary producers of knowledge, disseminators of knowledge, or the validation of professional workers”. (Hashemite Kingdom of Jordan Update, 2001)

<http://publications.worldbank.org/ecommerce/>

Access to higher education in Jordan is open to holders of the General Secondary Education Certificate who can then choose between public or private universities. The credit-hour system has been adopted at all universities, which entitles students to select courses according to a study plan. At present, there are eight public and eleven private universities in Jordan. All post-secondary education is the responsibility of the Ministry of Higher Education and

Scientific Research which was established by the new Higher Education Provisional Law (No 41). The Ministry includes the Higher Education Council and the Accreditation Council.

<http://66.102.104/search?q=cache:zsGeytEJ:www.lmu.edu/globale>

This project is designed with the aim to assess how the latest technology can be transferred to Jordanian universities.

Request letters were sent to all the universities in Jordan (eight public and eleven private) inviting them to participate in the research. Four universities two private and two public out of nineteenth universities promptly responded and evinced a strong wish to get involved in this study. The four universities met the sample requirement as this research aims to assess information and communication technology in both public and private sectors. The public universities represent the traditional methods in teaching and learning with some demand from the government to improve these traditional methods via ICT adoption in their daily work and pedagogy.

The first university chosen is the oldest public higher educational institution in Jordan. Its capacity as a comprehensive teaching, research and community-service institution enables its students to choose from a wide range of programs- more than 3500 different courses are offered by some 18 faculties. Faculty members shoulder the responsibility of delivering a quality education to the 32,322 students who are pursuing a wide variety of undergraduate and graduate programs. And its funding resources come from many directions (the annual budget, student fees from different programmes, government subsidy, the investments in immovable properties, and consultancy comes from different training programmes holding in it is centres, and finally extra aid comes from international organisations and institutions). Therefore; it suits the research sample as it represents the most traditional teaching methods which the proposed research model could positively impact.

The second university is midway in changing its teaching strategy, comprises twelve faculties (Arts, Engineering, Science, Law, Business Administration, Educational Sciences, Sports Sciences, Sheridan, Agriculture, Nursing and Paramedics, and Medicine, Social Sciences). This is in addition to the Deanship of Students' Affairs, the Deanship of Scientific Research, the Deanship of Higher Studies, and the Center for Southern Studies and Continuing Education, Computer Center and many other facilities. All of these Faculties are equipped with the most modern laboratories and computers to serve teaching and research. It is considered now as one of the biggest universities in the country with a total intake of nearly 16,000 students from all over the country and abroad. And its funding resources similar to the first university recourses, both of them are public universities and resources not confined these origins, (the annual budget, student fees from different programmes, government subsidy, the investments in immovable properties, and consultancy comes from different training programmes holding in it is centres, and finally extra aid comes from international organisations and institutions) Thus, it is worth observing how the change and adoption of ICT within this university is being achieved, in addition to its competitive experience within the private sector.

The third university was chosen as it is the oldest in the private sector. Since its founding year in 1990, this university has set a role model for launching many other privately owned universities in Jordan and in the Middle East. It presents its teaching mission through six faculties (engineering, pharmacy, info. technology, finance, humanities, and law). Students could choose from twenty programs afforded by the university. Financial resources come from (students' fees, utilization in immovable properties and from the owner of the university).

The fourth university is also private and it represents the modern teaching methods in Jordan. And is the most advanced in ICT infrastructure compared to the other universities, it enables

its students to choose from a wide range of programs distributed between ten faculties (arts, science, engineering, law, pharmacy, IT, financial resources, nursing, evening studies, graduate studies). Faculty members shoulder the responsibility of delivering a quality education to the more than 7500 students who are pursuing a wide variety of undergraduate and graduate programs. Financial resources as a private university come from many origins (students' fees, principal, revenues from investments in many projects and holding training courses, in the university centres.

I used case study approach which allows the use of a combination of varied data collection techniques. "The case study's unique strength is its ability to deal with a full variety of evidence: documents, artifacts, interviews, questionnaires and observations" Yin (1994) Case study, like other research strategies, is away to investigate the empirical topic by following a set of prespecified procedures. Case study deals with the problem from four directions: what the questions to study, what data are relevant, what data to collect, and how to analyse the results. The main purpose of the design is to help to a void the situation in which the evidence does not address the initial research questions. Typically, a case study researcher uses interviews and documentary materials first and foremost, (IS World.org,). I did a pilot study to explore and identify critical issues pertaining to ICT diffusion in HEIs in Jordan, this was carried out in the mid of the last year, it reflected my objectives and went toward my ultimate goals and helped me to define my research questions and objectives. Then I interviewed staff at different levels. Levy (1988) used open-ended interviews as recommended by Yin (1984) to expand the depth of data gathering, and to increase the number of information, in my research semi-structured interviews were used to enhance the researcher to acquire information that might not have become available through the questionnaire or observation. Interviews conducted with individuals whose responsibility included some aspect of information and communication technology (ICT). It's ideal for the case organization under study. These interviews were semi-structured, which included open and closed questions. Each interview consisted of including twenty three questions covering all study variables and objectives (See the appendix). The methodology which used (as I mentioned) was case study, Yin (1994) and it has four stages:

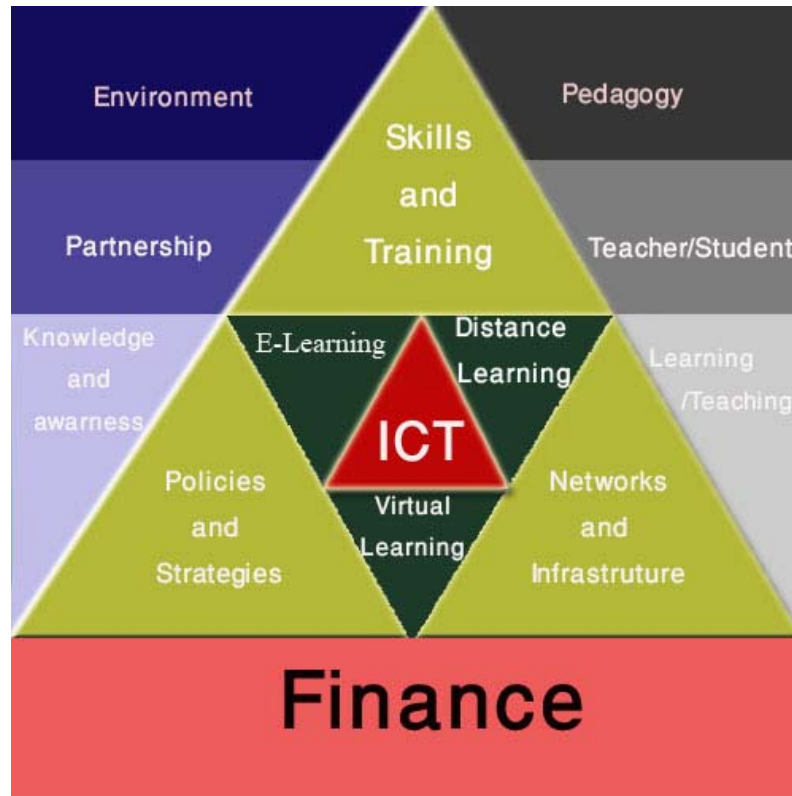
- Design the case study.
- Conduct the case study.
- Analyse the case study evidence.
- Develop the conclusions, recommendations and implications.

The first three questions (1,2,3) are intended to explain and examine the acquisition of ICT in higher education institutions [HEIs] and the impact of ICT on the nature of higher education institutions in Jordan. The second four questions (4, 5, 6, and 7) deal with another part of my study which is to define and analyze the range of ICT implementation in higher education Institutions [HEIs]. The third set of the questions (8, 9, 10, 11, 12, 13, 14, 15, and 16) relate to the important force of my study, to assess the critical successful factors (CSF) for ICT development in HEIs. The fourth group of the questions (17, 18) is planned to explore and investigate the viewpoints of the interviewees about ICT in HEIs in Jordan as an example of HEIs in the developing economy. And the final set of my questions (19, 20, 21, and 22) is about the main resource to adopt, implement, and develop ICT in HEIs .by understanding existing funding strategies for ICT in HEIs, to propose a framework for the development of funding strategies and business world.

Part of my field work conducted over the summer in Jordan, included a review of each university's documents in their sites as this provided me with more insights into the education system employed there, and indicated whether or not the university in question employs computer-assisted learning. Levy (1988) established construct validity using the single-case exploratory design, and internal validity using the single-case explanatory design. Yin (1994) suggested using multiple sources of evidence as the way to ensure construct validity. So, I

used multi-sources of evidence to provide validity and reliability, and finally develop the conclusions, recommendations, and implication.

I developed a model including my vision about the whole situation in HEIs; I tried to apply this model to every case in my field work, and reflect my vision on the real situation.



Model.1 ICT's Critical success factors in HEIs

5.1 Explanation of the Model:

ICT has become the essential factor for developing the education in the current century. In this model I put ICT in the inner triangle as the centre of the implementation of the E-learning, distance learning and virtual learning, as new types in the learning/ teaching process. ICT in the inner triangle forms the middle one. The outer triangle includes the critical success factors which are training and skills still needed to improve the educational process as a whole, and to qualify the different users in the different levels, policies and strategies of the higher education institutions are still one of the most important components which reflect the vision of the high management about short, middle, and long term strategies, to express how, to adopt, adapt, implement and transform, all functions to the new routes in the new educational world, and networks and infrastructure as a prerequisites to prepare the institutions ideally to accept the new technology smoothly of the ICT. All these triangles are based on the financial resources of the HEIs as the main point and the most important factor in this process. With no sufficient fund we are not able to recruit new types of technologies. The critical success factors are affected directly by some forces from bilateral fields, one from administrative forces and the other from academic forces. In one hand, the administrative forces include the environment surrounding the HEIs, here we are talking about internal environment or

organizational environment, and external environment, which includes the other institutions and organizations may either affected us or affected form us, positively or negatively, and the partnership with different sectors and communities, like private sector, educational sector, health sector, and even international community, in which our out puts are one of the most important inputs to other sectors and communities, like industry, banking, and any other areas, and the knowledge and awareness of the importance of ICT in HEIs, with no real awareness of the importance of ICT in HEIs the sum project will be failed definitely . In the other hand, the academic forces which can be pedagogy that every thing is coming to change the resources, materials, and ways in teaching, teacher and student are the main player in this game for accepting and using the ICT, and learning and teaching in the HEIs, the process became more interesting and attracting, using multimedia tools, even the role of every one is changing, using more sophisticated and developed methods, teachers became a facilitator or coordinator, and the students became a members in group.

5.2 Discussion:

After I had interviewed the subjected people and had reviewed each university's documents in their sites. I used multi-sources of evidence to provide validity and reliability. I found that administrative force with its elements (CSF) explains the urgent need to recruit ICT applications and programmes, this force deals, with internal and external environment, and touch awareness and knowledge of the importance and the necessity of ICT in global world from different users in the different levels and positions. The deep need is to bridge the relations between HEIs and other institutions and organizations in different sectors, and areas, locally and internationally.

Academic force with its elements (CSF), indicates that educational systems are going to change, from different directions, pedagogy including teaching/ learning plans, and methods to transform the pedagogy toward new educational systems, and the new role of teachers over students, and methods to explain required educational materials using ICT tools and applications, and the role of the students as the ultimate goal in HEIs, and how to recruit the potential students with good reputation, showing our strong outputs.

The outer triangle which includes (CSF) pointes to; the urgent need for training programmes to qualify users that every one must have- at least- the lowest standards of the knowledge, and skills about how to use ICT applications and programmes in the daily life. To work and tackle problems with comfortable minds, in both forces administrative and academic, digital environment have to be built based on good infrastructure, as well as create strong communication systems that would be connected with easy and fast networks. By so doing, we will be able to employ clear and written policies and strategies for long runs. Thus, the updating development in the HEIs world can be enhanced, this is reflecting the vision of his majesty and government care and commitments to build new educational era includes new types of learning (distance learning, E learning, and virtual learning), which are embedded in the inner triangle of the model by using the current and even more advanced ICT programmes and applications. As a result, the digital universities arrive the morning after the night before.

All these triangles are based on the financial resources of the HEIs as the main point and the most important factor in this process. With no sufficient fund we are not able to adopt new types of technologies and recruit qualified staff. Any shortage of funding would delay the progress of the project, reduce the benefit, increase the cost and time, or fail at the end.

6. Findings

- Most of the respondents focused on the cultural element. ICT always deals with different nations, cultures and languages. Every one should be aware of the importance and simplicity of new services that every one might make mistakes in his work, and lose information. Electronic systems secure this information in easy ways, and retrieve, review, and use it at any time without wasting time or efforts.
In Jordan we need to raise awareness regarding the benefit of ICT and provide students and staff in universities with access to infrastructure and not look at ICT as some thing for the elite which a limited number of people will benefit. The rationale behind this almost one third of Jordanian population is located in learning centers, in which the main problem within universities may be the flow of information and not the equipment.
- Jordan acts as a competition state based on co- ordination between private and public educational sectors and to achieve competitiveness in a globalized world, tries to adopt and adapt new technology in Jordanian universities, and it became obvious that educational institutions are competing to recruit the potential students and deal with them as a costumers from the commercial principle, and address the training needs of the students to use the available ICTs in Jordanian workforce after graduation.
- The majority of the respondents asked about the ways of how could we enlighten users about the role of ICT, as a central tool we must use for a vital demand in the outdoor market, and using ICT is to build a pathway to the information revolution, to improve teaching methods, enhance learning, strengthen research functions, and manage other academic information services, to produce graduates endowed with high level skills in the new competitive global economy. In Africa the Association of African Universities tried to assess how African Universities are facing the challenges of using ICTs, they conclude that there are an External obstacles: lack of enabling environment, absence of national information and communication infrastructure policy, and high internet services providers (ISP) fees. We keen to build an environment encourages implementing ICT programmes and applications; this environment could appoint the human understanding and ability to like the idea, to motivate them on the light of this understanding. ICT became industry and there is a dire need for qualified humans to produce, and perpetuate in commercial view.
- One of the most important problems faced by universities is the lack of training for staff and even students to learn the basics of IT competence. Association of African Universities concludes that Human resources-related obstacles: no trained technical and supported staff, absence of plans for integrating technology into teaching and learning. You cannot expect qualified teaching staff with no adequate computer hardware, software to keep immediate in touch with students, and what they are doing. Jordan still suffers from both absence of specialised IT institutions, or high skilled staff who are escaping to another institutions with high salaries and wages, even users, who still suffering from the absence of reasonable laps, hardware, and software, insufficient conformity between the academic profiles of present graduates and industry needs; and limited IT resources.
- There is consensus to activate many educational soft wares, in the classrooms and laps, using new ICT tools and accessories to get the extreme benefit, and to attract students and encourage them to contact, and communicate others via Email. The inadequate quantity and quality of computer forces teachers and staff who can afford the cost in purchasing their own hardware and software. Planning of ICT for teaching and learning, course development, course structure and assessment is yet to be

firmed. Some of the plans are still in the mind of the persons responsible for managing the new types of learning. Planning for using ICT in teaching and learning seems to be still on the drawing boards. This is consistent with (Hussain 2004) when talked about E learning in Higher Education Institutions in Malaysia

- Although we had transferred from the technology era to information era, to fund HEIs projects still considered as the most important element in this process. ICT is an investment more than wasting and attrition money, so interviewees assure that we should plan and work deeply practically before starting, and getting through in this programmes. And decision makers are still afraid not to continue, not to finish, or not to develop the projects (buy software, hardware, equipments, databases, or even not to develop the networks and infrastructure), We have to notice that we can not develop educational software without funding, and, moreover, we can not consider new technology as just a means to gain with whole education, especially if we know there are a shortage of subsidy from the government, and HEIs became nearly depending on its own resources. Institutions have to work with limited budget allocated for the development of teaching and learning materials, this wastes time and efforts and makes the process more complicated, and if found it is still incredible, outsourcing of new types of learning content development and training of lectures to use these types. This conclusion so close with the assessment had done by Hussain in Malaysia. Association of African Universities commented that, financial resources and uncertainty of donor funding may be the most daunting obstacles to the aspirations of African universities to become active players in the global knowledge revolution.
- Some of the interviewees talked about unstable mood by the decision makers, because there is no clear vision or written plan or strategies could afford these systems. (Hussain 2004) concluded that strategic intention of the senior management is not made clear to the e learning project members. And education experts are often not consulted at the initial decision making stage. We create the environment without legal framework; we should activate the electronic actions law to organize and follow up the functions and regulations in the work and clarify the high management strategies to be achievable in the daily work.
- One of the surprising findings comes up depending on the respondents comments that some of the users in different levels of the organizations did not accept new ICT applications and programmes for one reason: in order not to lose their power and to keep it in their hands, or lose their positions that consider new technology as new strange comer it must resisted, or this system must adapted with their personal goals. Those people have long experience exceed the age of this new technology, and regulations and laws protect them to the end.

7. Implications

- ICT is used in a wide range of applications in HEIs; we should in our institutions find the appropriateness of ICT to increase the efficiency of education delivery and adequate response to a new learning paradigm and the adequacy of the ICT for research and development in the light of globalisation.
- One of the key issues is that an assessment should be undertaken of the present status of ICT in HEIs on one hand, and the future needs, from the other hands.
- We should be concerned with preparing HEIs for success in today's world, success as individuals, as members of society, as workers, as lifelong learners. It seems clear

that among the most essential ingredients of success today is the ability to learn, communicate, evaluate, and manage all forms of information.

- In recent years, much attention has been given to the so-called “digital divide” between those who have access to various technologies and those who do not. HEIs reach now extends far beyond what was once possible or even imaginable. This transformative process will undoubtedly continue as broader bandwidth affords faculty and students, as well as administrators, access to new opportunities
- One of the key issues is infrastructure and existence of communication network, not less than good, which is very important to implement ICT in HEIs. Strong infrastructure encourages the development of ICT and present services in thorough and consistent way, and presents these services through new electronic systems, matching with new development in the international educational world.

8. Appendix:

Interviews questions

- To what extent do you think ICT is adopted by the university? What is the best method to adopt ICT in the university?
- Do think there is impact of ICT in higher education?
- What impact does ICT have on HE?
- What do you think the most suitable method for ICT implementation in the university?
- How did you implement ICT in your university?
- What factors do you think will help/ have helped in successful ICT implementation/adoption?
- Did you find any difficulties in ICT development in the university? If yes:
 - What are these difficulties?
 - Do you train your staff or student to use ICT?
 - What do you think the most suitable methods to train and qualify users to adopt and implement ICT?
 - How could you evaluate these training programmes and the successful ratio for ICT implementation efficiently, and effectively?
 - How could we benefit from adopting and implementing ICT in the class?
 - What is the usage ratio of ICT in the class? Do you think this adoption increase interaction between students and teachers?
 - Do you believe that current infrastructure is suitable to adopt and implement ICT in HEIs? How could we develop it for future?
 - Represented in its HEIs on the map of implementing ICT comparing, where would you classify Jordan with other countries in the developing countries?
 - What is your vision about the future of ICT in HEIs? From which view you mentioned?
 - What are the financial resources for ICT in the university? Do think these resources still sufficient?
 - What do you think the best way to secure funding ICT in the university?
 - What is the best way from your view point; find it ideal to fund ICT in HEIs in the future?
 - How could we benefit from the competing in the business world to fund ICT in HEIs?
 - Could you propose framework to fund this acquisition in demand over ICT in HEIs?
 - Do you have any comments or any thing you need to add?

Age: Qualifications: Gender: Position: Experience:

9. Bibliographies

- Al-Jaghoub S and Westrup C. 2003 'Jordan and ICT-
Led development: towards a competition state?
Information Technology and People, 16(1):93-110.
- Al-Jaghoub S and Westrup C. 2002 'ICT in developing
Countries and the role of the nation state;
Building a Software industry and bridging a digital divide? The case of Jordan
- Allen *et al.* 1997. 'Case Studies II: Integrating Learning with
Technology' *a series of case studies by the University of
Stirling's institutional TLTP Project Varsetile*, August.
- Association of African Universities, GUIDELINES FOR INSTITUTIONAL SELF-
ASSESSMENT OF ICT MATURITY IN AFRICAN UNIVERSITIES,
Sited at:
<http://www.aau.org/english/documents/ICT-guid.pdf>.
- Bell G.M and Dallinga C.1994 'Information Technology:
Issues for higher education management' London, Jessica Kingsley Publrs.
- Dempster J. 2003. 'Developing and Supporting
Research-Based Learning and Teaching through
Technology' *Chapter VII*, University of Warwick, UK
- Evan C. And Fan J.P 2002. 'Lifelong learning through the Virtual University,
Campus-wide information systems, Vol. 19(4): 127-134.
- Farrell G. M 1999 'the Development of Virtual
Institutions in Canada' sited at:
<http://www.col.org/virtualed/chapter2.pdf>
- Fung A. CW. 2001 'Using ICT as a Strategic Tool in
Education' Hong Kong Baptist University, March
- Gabriel G. C. 2003 'Decentralising asset
Management in a university environment using Web
Enabled technology Facilities' 21(10): 233-243
- George J. f and King J.L 1991 'Examining the Computing
And Centralization Debate' *Communications of the ACM*,
34(7)
- Guan, j. *et al.* 2002 'Institutional strategy and information support: the role of
Data warehousing in higher education'
Campus- Wide Information Systems, 19(5):168-174.
- Gunasekaran *et al.* 2002 'E-Learning: research
And applications, *Industrial and Commercial Training*,
34(2):44-53.

(Hashemite Kingdom of Jordan Update, 2001)

<http://publications.worldbank.org/ecommerce/>

Hopkins D.J 1996 ‘Information Technology and the Information Society in Europe: Expectations and Barriers To the Implementation of New Media in the Higher Education and Research Sector’ August

Hussain, R.M, 2004.E learning in Higher Education Institutions in Malaysia, Kuala Lumpur, Malaysia.

Sited at: <http://www.e-mentor.edu.pl/xml/wydania/7/102.pdf>

Iivonen and White, 2001 ‘the choice of initial web search strategies: Comparison between Finnish and American searchers, *the journal of Documentation*, 57(4):465-491

Levy, s., 1998, Information Technologies in Universities: *An Institutional Case Study*, Northern Arizona University

Levy Y and Murphy K. E 2002 ‘Online Learning Networks, 35th Hawaii International Conference on System Sciences, IEEE COMPUTER SOCIETY

Molz *et al.* 2002 ‘7 Suggestions for Better Integrating ICT Enhanced Instructional Approaches into Campus-Based Higher Education’ *the New Educational Benefits of ICT in Higher Education*, Germany: 46-54

Oliver R. 2002 ‘the role of ICT in higher education for The 21st century: ICT as a change agent for education, Western Australia.

Potgieter and Herselman (2003), using ICT in Tertiary Education – Do We Dare to Compare? *Proceedings of the 16th Annual NACCO*, Palmerston North New Zealand, July, pp 389-392.

Romero L and Del R. E 2004 ‘Competition Between public and private universities: quality, prices and Exams’ *working papers, Economic Series 23*

SUMMARY: 2004. AECE - Yarmouk University, Sited at: <http://aece.yu.edu.jo/ict/summary.htm>

Siriwongworawat S 2003 ‘Use of ICT in Thai Libraries: an overview’ *Program: electronic library and Information systems*, 37(1): 38-43.

Sridhar S. 2005. ‘E-Government –A proactive Participant for e- Learning in higher education, the journal Of American Academy of Business, Cambridge, 7(1):258- 268

Trentin G. 2002 ‘From Distance Education to Virtual Communities: The Wide Range of Possibilities for Using The Internet in Continuous Education and Training, *International Journal on E-Learning*, January-March

**Vitangcol III AL. S. 2002 ‘the Implications of Virtual
Education in Higher Education Institution’**

Yin, R. (1984), Case Study Research: Design and Methods, Sage, Beverly Hills, CA

**Yin R. K. 1994 ‘Case Study Research: Design and Methods’ 2nd edition.
Sage Publications**

<http://66.102.104/search?q=cache:zsGeytEJ:www.lmu.edu/globale>