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Improving higher education in Egypt through e-learning programs: HE students and senior academics perspective

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Abstract: The large number of students per class in the Egyptian Higher Education (HE) has highlighted the need for e-learning adoption; as it can serve a great number of students regardless of class capacity. Although literature is rich with studies regarding e-learning and how it is adopted, technologies cannot be adopted regardless of the stakeholders' perception, readiness and preferences. Thus, the research inquires on: 1) the effects of the perceptions of HE students and academics on the provision and use of e-learning; 2) the opportunities of improving HE in Egypt through e-learning from the same perspective. Accordingly, HE students and academics, as the two main e-learning stakeholders, were surveyed. A structured questionnaire was administered to target HE students, where data was statistically analysed. Academics were interviewed and data was transcribed and interpretively analysed. Findings enabled researchers to provide HE decision makers with clear guidelines on adopting e-learning in Egypt.

Keywords: e-learning; perception; e-readiness; higher education; stakeholders.

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1 Introduction

The ways services are delivered to customers have changed, and automated applications were noticeable due to the penetration of technology and computers in many different sectors including education (Abd El Aziz, 2009). The number of university networks worldwide has been growing rapidly and students have started to use computers and the internet as a vehicle for self-directed learning, educational broadcasting and videoconferencing (Varis, 2006).

The environment of HE is developing due to a number of factors such as rising costs, shrinking budgets and an increasing need for distance education encouraged the realisation of e-learning in HE, creating new and exciting opportunities for both educational institutions and students (Wagner et al., 2008).

E-learning has been defined in different ways as shown in the work of Wagner et al. (2008). It is generally defined as the "*instructional content or learning experience delivered or enabled by electronic technologies*" (p.26). E-learning has also been defined as "delivering educational material through the use of the internet, intranets/extranets, audio- and videotape, satellite broadcast, interactive TV and CD-ROM which can also be used for interaction among members". Blended learning is a type of education that combines face-to-face classroom methods with computer-mediated activities. It is a relatively new concept with a mixed track record that has more advantage and preferred by both instructors and students (Watson, 2004). Integrating certain types of technology into the classroom gives teachers and students a real-time feedback so that each student can work freely and can give teachers accurate information that can help in grouping students according to comprehension levels on specific subjects (Marsh, 2012).

In the Egyptian industry, learning is a major fragment. Learning institutions in Egypt have recognised the significance of investing in technology in order to address factors such as controlling costs, attracting students and fulfilling customers' needs like most service providers worldwide (Weinert, 2005). Therefore, in order to promote e-learning in Egypt, it is required to understand how different stakeholder groups perceive e-learning, and whether the variety of perceptions affect its provision and use in the Egyptian context.

1.1 Problem definition

As a service provider in a major sector of the Egyptian industry, learning institutions have realised the importance of investing in technology to control cost, attract students and fulfil customers (Weinert, 2005). Literature has been rich with studies regarding

e-learning potential benefits. It also provides a clear view on how e-learning is adopted in developed countries. However, technologies cannot be adopted regardless of the adopters' nature, perception, readiness and preferences.

The quality of HE in Egypt is decreasing due to the rapidly growing enrolment that started in the 1970s and 1980s, which, as a result, lead to crowded classes and the decrease of resources available (Richards, 1992). However, although e-learning seems to be the dream that would solve the education hassle in Egypt by considering it one of the optimal solutions for the Egyptian HE, still it is not utilised according to its capacity. Therefore, in order to make e-learning more popular and to successfully adopt this technology, it is necessary to understand some of the e-learning stakeholder group's perception, readiness and preferences.

A number of studies have investigated the perception of e-learning and social awareness. Unfortunately, previous studies have come to their conclusions based on sampling only students as the main e-learning stakeholders and end users (El-Zayat and Fell, 2007; Abdel-Wahab, 2008; Bertea, 2009; Hashem, 2009; Hegazy and Radwan, 2010). It is recommended that further research is needed to decide whether e-learning is preferred by students and/or whether e-learning is actually considered better than traditional instructional methods in a Middle Eastern context and consequently in Egypt.

Therefore, it was important to investigate how different perceptions of e-learning in Egypt in the HE sector affect its provision and use in Egypt and the ways in which e-learning can promote HE in Egypt will be also addressed.

1.2 Aim of the study

The main subject of the research paper is to investigate how the two main HE stakeholders' perceptions affect its provision and use in the Egyptian context and the ways in which e-learning could improve HE. Accordingly, in an attempt to answer the research questions, HE students and academics were surveyed in order to investigate e-learning different perceptions, readiness, provision and use, and whether it would improve HE and hence the quality of HE in general. Thus, the main objectives of the research at hand are to investigate the following:

- the main factors effecting the perception and readiness of HE students on the usage of e-learning
- the main factors affecting the readiness of HE academics regarding e-learning provision
- parents' potential acceptance of e-learning in higher education in Egypt
- factors affecting the recruitment of e-learning graduates
- driving factors of e-learning in Egypt.

Finally, the study uses structured questionnaires to target HE students. Data collected will be statistically analysed using a statistical package (SPSS). In order to get a clearer picture, it was worth interviewing HE academics seeking similarities and differences between the two perspectives and based on the study results, decision makers involved in the HE development are provided with clear directions and guidelines on adopting e-learning in Egypt.

1.3 Research questions

- What are the effects of the different perceptions of HE students and senior academics on the provision and use of e-learning?
- What are the opportunities of improving higher education in Egypt through e-learning programs from the perspective of students and academics?

In order to understand the research problem and in an attempt to answer the research questions, the following hypotheses were devised:

 H_01 : There is no relationship between students' e-learning perception and e-learning readiness in Egypt.

 H_02 : There is no relationship between students' e-learning readiness and e-learning provision and use in Egypt.

 H_03 : E-learning provision and use have no effect on the improvement of HE in Egypt.

Chi-square tests were used to assess whether the distributions of results differ by different questionnaire segments which might have arisen by chance. Interpretations are given in Section 6.1.3.

2 Higher education in Egypt

Egypt has a great potential to expand in e-learning activities due to its high population, which exceeds 84 million (Abd El Aziz, 2012). The Egyptian HE sector includes 17 public and 19 private universities, respectively, located within major cities engaging 14,31,469 and 71,715 students (Information and Decision Support Center, 2010). It was noticed that most HE problems occur in the public sector. Such large figures make regular attendance very difficult or even impossible for those who are located at a distance from their centres (El-Zayat and Fell, 2007).

The HE quality in Egypt has been declining due to the rapidly growing enrolment rate that started in the 1970s and 1980s, which lead to a large number of students per class (Richards, 1992; Rossiter, 1997; Beckstorm et al., 2004). The main reason behind this was the free admission to universities that started during Nasser's regime. As a result, Egyptian university classrooms became overloaded with some lecture halls reaching up to 1500 students.

The underfunding of universities in Egypt is mainly the prime reason for a lot of quality problems. University buildings are not in a good condition, most of them as Cairo University, for example, needs repair. Classrooms may also have poor equipment or insufficient according to the number of learners. The underfunded university libraries made most students and instructors depend only on the basic textbook for classroom materials causing learners to memorise what is in the textbook only without going through other secondary materials. Professors teaching in public universities are neither well paid nor graded on their performance or the rates at which their students pass or fail (Beckstorm et al., 2004). Consequently, setting up private tutoring programs in universities is considered common to make extra money.

On the other hand, the current Egyptian public university system in Egypt does not prepare students for career opportunities. Numerous graduates lack strong quantitative skills and/or do not have much knowledge of the use of technology like computers. Most of the Egyptian universities do not guide students about job-hunting, job training and other career-related skills such as networking. As a result, all these factors point towards a lack of preparedness for the job market and current market requirements (Richards, 1992; Holmes, 2008).

The previously mentioned HE conditions in Egypt highlight the importance of increased flexibility provided by the broad variety of e-learning techniques; which could be the solution to a number of HE problems in Egypt (El-Zayat and Fell, 2007).

3 E-applications in Egypt

3.1 E-commerce in Egypt

The impact of e-commerce on developing countries could be even stronger than that on developed countries because the scope for reducing inefficiencies and increasing productivity is much larger in the developing countries (El Gawady, 2005). Accordingly, the role of information and communication technology is increasingly affecting the Egyptian environment and the way services are provided (Kamel, 2002); especially as e-commerce promises enormous opportunities for the Egyptian market.

E-commerce could enable Egypt to experience a more open economy, help in the nation's economic development, and provide new opportunities for penetrating international trading. However, there are a number of barriers that face the adoption of e-commerce, some of which are lack of consumer awareness, corporate awareness, training, trust and resistance to change together with the language barrier (Kamel, 2002; El Gawady, 2005).

Thus, in order to keep pace with the developed world and to leverage its developmental plans, a number of developments need to take place to transform the above-mentioned challenges into opportunities (Hegazy and Abd El Aziz, 2002). Such developments would have to be carried out by the government in collaboration with the private sector to provide a horizontal approach to development in order to avoid the creation of gaps within the community and also to be able to realise the critical mass required for a successful e-commerce community to prevail.

3.2 E-learning attempts in Egypt

E-learning is believed to be as one of the main elements that would support the formation of modernisation in the Arab region and is seen as an important tool for enabling Arab citizen to gain access to high-quality HE. However, financial, pedagogical and attitudinal factors are the main limitations for adopting such technology (Abouchedid and Eid, 2004). A number of studies have stated that HE institutions, mainly public ones, consider adopting as an important turning point (Mourad, 2010).

The free internet access nationwide, with more than 15,000 ports serving 2 million users, and Digital Subscriber Line (DSL) in Egypt, has enabled many users to utilise the high speed and affordable service, which has reached 19.99 million users and 1190.61 thousand DSL users in 2010 (Information and Communication Technology Indicators Bulletin, 2010).

The Egyptian government frequently admitted its inability to support the HE system without the active support of the private sector as well as the adoption of the new open access online education service (Mourad, 2010). The introduction of innovative programs that focus on problem-solving and applied work is part of the solutions offered in which boosting e-learning programs is considered (Richard, 1992). As a result, efforts were made by the government to introduce new modes of open access online education services not only for HE but also for secondary schools (Mourad, 2010).

E-learning has been applied in Egypt in a number of projects that took place mainly in undergraduate education, where the Ministry of Education (MoE) used interactive CD-ROMs and virtual class technology in a number of schools. The number of classes and schools that used such technology increased to reach 450 class and 50 schools by 2004 (Fayek, 2004; El Shenawi, 2010). According to the same study, the MoHE had a number of e-learning applications in Cairo University through an open learning program, Military Technical Collage using virtual class technology, German University (GUC) in which e-learning technology helped in bringing live industry to education and the American University of Cairo (AUC) which uses WebCT as a learning management system (Fayek, 2004; El Shenawi, 2010).

The Arab Open University (AOU) is one of the important projects in Egypt that uses e-learning. It offers degrees through distance learning that relies on course lectures laid out in textbooks, CD-ROMs, audio and video cassettes, etc. Kamel and Wahba (2003) presented Egypt's experience with the Global Campus project aiming to deliver programs using a hybrid model of traditional and unconventional ways relying on distance learning. The project included modules on CD-ROM and on the internet in a mixed learning environment, together with local learning support centres such as the Regional Information Technology Institute. Using the internet, students are provided with tools to facilitate their learning, communicate with their UK-based tutors and enable group discussions and online resources.

Several e-learning projects have been initiated by a number of Egyptian government universities since 2002 such as Higher Education Enhancement Project (HEEPEE), Open source platform for higher education (MEDA) and Tempus projects (Abdel-Wahab, 2008). The Egyptian Ministry of HE has made its first attempt to establish an e-learning university in collaboration with HE institutions in Italy, Canada and the USA to launch Egypt's first electronic non-profit university. It is assumed that e-learning could provide solutions to problems such as overcrowded classrooms and transportation problems that have been obvious.

E-learning in Egypt provides an economic and more suitable solution to the HE problems by filling in the gap between the number of university places available and the growing demand for HE (Khaled, 2008). National studies regarding Egypt's readiness for e-learning have discovered positive results, and governmental plans have been offered to support e-learning infrastructure (Baraka, 2005). Not to mention that, despite the poor perception of e-learning in many parts of the Arab region in 2004, Beckstorm has proved the Egyptian readiness for e-learning (Abouchedid and Eid, 2004).

In the same token, Abdel-Wahab (2008) measured student's intention to adopt e-learning in the University of Mansoura, where results revealed that 79.8% of students intend to adopt e-learning. Attitudes towards e-learning usefulness, ease of use, pressure to use and the availability of resources needed to use it are all predictors in modelling student's adoption intention (El Gamal and Abd El Aziz, 2011).

In order to meet the students' needs and cover the job market requirements, the Egyptian government should consider e-learning, especially in the HE, where most of the problems originate (Abdel-Wahab, 2008; Khaled, 2008). Yet, there are challenges to adopting e-learning. According to El Shenawi (2010), the accreditation and evaluation criterion of e-learning certificates is needed to guarantee e-learning success. On the other hand, El-Khayat and Narraz (2010) argues that e-learning should consider Egyptian students' social traits and characteristics. Unawareness, resistance to change and computer/internet illiteracy are major challenges of adopting e-learning in Egypt (El Sebai, 2006; Abdel-Wahab, 2008).

In a nutshell, although e-learning in Egypt has many challenges, yet the perceived usefulness outweighs the disadvantages. Therefore, in order to successfully adopt it, main stakeholders cannot be ignored (Abd El Aziz et al., 2007); especially service providers and users who directly deal with the system (Goode and Moutinho, 1995).

3.3 E-learning readiness

According to Samson (2011), readiness for an organisation intending to adopt e-learning can be defined as the "*mental or physical preparedness for that organization for some e-learning experience or action*" (p.126). Since the number of organisations adopting e-learning is increasing, it is important to assess their readiness and to match learning strategies with local needs, which is why a number of countries have developed their own strategies to implement e-learning for their HE. However, there is still a great demand to discover ways to blend e-learning into organisations, especially in HEIs (Mackeogh and Fox, 2009).

Many authors emphasised the need to adopt e-learning with careful planning to prevent failure (Aydin and Tasçi, 2005). Anderson (2002), Bean (2003), Chapnick (2011) and others designed several models to assess individuals' or organisations' readiness for e-learning, which have been mainly developed for commercial organisations rather than HEIs. These models consider views, needs and experiences of different stakeholders such as policymakers, administrators, lecturers and learners.

3.4 *E-learning implications in developing countries*

E-learning is seen as a tool that provides numerous advantages for learning especially in the higher education sector. Increasing access to higher education especially marginalised groups in rural areas besides cost effective and more flexibility are on top of e-learning drivers. Unfortunately, e-learning adoption faces many challenges especially in developing countries. The great dependence on traditional ways of teaching and learning specifically in higher education has been a major reason behind the lack of essential e-learning enablers such as computer devices and computer skills (Dhanarajan, 2001; Heeks, 2002; Rajesh, 2003).

Interactive learning environments as e-learning require active participation of student, which is uncommon in developing countries (Eastmond, 2000; Evans, 2005; Sehrt, 2003). Students are still more oriented towards gaining knowledge mainly from their instructors and used to studying from text books and notes, which is not the case in e-learning environments where the role of instructors is mostly guidance. Since e-learning is a concept that has originally emerged in the West, where countries are more developed; it is essential to understand its challenges before adopting it in the developing

countries' context (Andersson, 2009). Thus, the potential benefits that e-learning could offer to higher education especially in developing countries could be achieved.

Akbar (2005) identified the main challenges and key role players concerned with implementing the needed strategies for promoting e-learning. The first concern was the infrastructure of e-learning facilities and resources. National strategies and plans for e-learning established by the government are the starting point, ensuring the development of ICT infrastructure, developing expertise on e-learning teaching modalities for professional development, establishing partnership and cooperation among the stakeholders. The quality of the e-learning programs offered was also another major concern in the same study. Ensuring the quality of e-learning materials in collaboration with governmental institutions and academicians, certification of the programs and promoting awareness of e-learning facilities among the learners were on top of the challenges discovered.

Those results were not far from Andersson and Grönlund (2009) who studied the major challenges for e-learning, in general, and the differences concerning challenges for e-learning between developing countries and developed countries. After an extensive literature review, the study identified 30 challenges for e-learning that were grouped under four main categories:

- course challenges: concerned with content, design and delivery of courses
- challenges relevant to individuals' characteristics, students as well as teachers
- technological challenges: concerned with infrastructure, costs, usability and appropriateness of technology
- contextual challenges: concerned with organisational, cultural and societal challenges.

The study revealed that although all challenges are also relevant for developing countries, factors related to individuals' characteristics such as orientation towards students' activities, self-learning and motivation in developing countries were less important. Therefore, there is a need to change the teaching pedagogy to be more oriented towards students' activities, self-learning and motivation. This change will affect traditional learning methods and consequently e-learning environments after some time; thus, crossing this barrier.

In the same token, Bhuasiri et al. (2012) identified the critical success factors that influenced the acceptance of e-learning systems in developing countries among two stakeholder groups, ICT experts and faculty. Six dimensions for implementing e-learning systems in developing countries were discovered, including learners' characteristics, instructors' characteristics, institution and service quality, infrastructure and system quality, course and information quality, and extrinsic motivation. Based on the results, the most important dimension for ICT experts was learners' characteristics, whereas infrastructure and system quality were the most important dimensions from the faculty perspective.

Similarly, Ssekakubo et al. (2011) conducted a survey through interviewing the key e-learning personalities involved in e-learning programs in five different universities in Africa. The study aimed at identifying the underlying causes of failure in Learning Management Systems (LMS). The study discovered that the failure of LMS supported e-learning initiatives in developing countries is not mainly in technology, but rather more

with the ways institutions are using the LMS to improve, support and facilitate student learning. Some of the most probable causes of failure identified were: high ICT illiteracy rates among the student community, low comfort levels with technology, usability issues of LMS, poor marketing strategies, ineffective maintenance strategies and insufficient user/technical support. The study recommends that if LMS have the potential to accomplish their potential benefits in the developing world, future research and development efforts should be aimed at overcoming barriers discovered.

4 Research framework

A survey was designed based on an extensive review literature. Data collected during the survey seeks to investigate both stakeholder groups' perception and readiness towards the adoption of e-learning, and whether it affects the provision and use of e-learning in Egypt, enhance HE in Egypt and how whether its adoption can fill in the gaps and solve problems that occur in the current HE.

Figure 1 Research framework



In order to test the strength of the relations between each variable in the above research framework, simple regression analysis was calculated, given the equation: Y = a + bx, where Y is the dependent variable and x is the value for the independent variable. The results obtained helped determine the effect of e-learning perception on the readiness to use e-learning, the effect of the readiness to e-learning on its provision and use in the Egyptian context, and the effect of the latter factor on the HE improvement in Egypt.

The final conclusion is formulated after analysing the data collected during the questionnaires distributed among HE students statistically besides interpretative analysis for the interviews conducted with senior academics.

5 Methodology and data collection

Structured questionnaires were distributed over 200 student respondents at the Arab Academy for Science and Technology and Maritime Transport (AASTMT). AASTMT was selected as a sample of undergraduate HE in Egypt since it is one of the largest and oldest private universities after the AUC with four main branches located in the major

cities of Egypt (Cairo, Alexandria, Port Said and South Valley). The geographical distribution of the university's branches has helped the researchers gain a representative sample of the Egyptian context on which the results were based. Questionnaires were distributed in Alexandria and Cairo branches among both business administration and information technology students. Data collected was statistically analysed using SPSS. Results are described in Section 6.1.1.

Ten semi-structured interviews were designed and conducted with senior academics at the same schools in order get a deeper insight and a broader picture of the research problem. Interview data was transcribed and interpretively analysed. The triangulation of methods used to collect data has helped better answer the research questions (Section 1.3).

5.1 Questionnaires

A structured questionnaire was designed to survey students' usage patterns, e-readiness, their perceptions and priorities with regard to e-learning usefulness, effectiveness, implementation issues and opportunities for HE improvement through e-learning programs. The survey was administered in the two main cities in Egypt. A total of 101 valid questionnaires were returned from 200 distributed at the AASTMT (Cairo and Alexandria Branches) as a sample taken from the private HE. The AASTMT was chosen as it is one of the oldest private universities located in Egypt after the AUC besides ease of accessibility and time issues since the researchers are academic staff.

Questionnaires were designed in English and translated into Arabic. Questionnaire forms were distributed in both languages, according to respondents' preferences. All questionnaires were distributed by hand during lectures after taking the consents of faculty, deans, lecturers and students.

The questionnaire included nine variables distributed among 14 different questions. It included seven multiple choice questions, two ranking questions and five Likert scale questions. A summary of the questionnaire form is presented in Table 1.

No.	Question	Possible answers
1	Your internet access is mostly from	Home/Work/Other
2	How often do you access the internet?	Daily/Weekly/Monthly
3	Do you use the internet for educational purposes?	Yes/No
4	Have you ever heard about e-learning?	Yes/No
5	Which would you prefer?	Traditional/E-learning
6	Would your parents encourage you to have your HE certificate from an e-learning university?	Yes/No
7	Would your parents agree to enrol you and fund your studies at an e-learning university program?	Yes/No

Table 1Questionnaire summary

Table 1	Questionnaire summary (continued)

No.	Question	Possible answers
8	Please rank the following e-learning criteria by putting them in order of importance for you, using 1 to mean the most important, and 5 to mean least important.	1: Most important 2: Important
	Internet connection should be reliable	3: Less important
	E-learning programs should be useful and effective	4: Not important
	Ease to use course electronic material	5: Least important
	E-learning certificate should be accredited	
	Creating societal awareness of e-learning concept	
9	HE problems are:	1: Strongly agree
	Free education	2: Agree
	Large number of students per class	3: I do not know
	Lack of innovation in programs	4: Disagree
	Poor instructor capabilities	5: Strongly disagree
	Limited budgets	
	Lack of practical work	
	Admission system to universities	
10	E-learning challenges ranking	1:Most important
	Lack of face-to-face interaction and close supervision	2: Important
	Non-real time feedback to enquiries and assignments	3: Less important
	Cultural resistance to change and adaptation to technology	4: Not important
	Technological gap (Internet speed and bandwidth/computer skills needed)	5: Less important
	Lack of normal college environment	0. Deust important
	Establishing and developing reliable course material	
11	E-learning graduates may gain more skills due to:	1: Strongly agree
	Use of computer applications	2: Agree
	Encouraging responsibility	3: I do not know
	Search and data gathering abilities acquired	4: Disagree
	Experiencing practical work environments	5: Strongly disagree
	Use of recent up-dated information sources	
	Availability of free time to develop talents	
	More team work involvement	
12	E-learning graduates may be acknowledged by employers because:	1: Strongly agree
	E-learning graduates studied the same set of topics	2: Agree
	E-learning exams and grades have valid criteria	3: I do not know
	E-learning graduates got the same practical training	4: Disagree
	HE authorities supports e-learning programs	5: Strongly disagree
	E-learning graduates acquired the same knowledge	
	Employers are familiar with e-learning systems	

Table 1Questionnaire summary (continued)

No.	Question	Possible answers
13	E-learning graduates may have equal recruitment chances because:	1: Strongly agree
	E-learning graduates are considered well educated	2: Agree
	E-learning graduates are regarded as skilful and responsible	3: I do not know
	employees	4: Disagree
	E-learning graduates have practical experiences	5: Strongly disagree
	E-learning certification is admired by employers	
	E-learning is approved by HE authorities	
	Employment depends on other factors (e.g.: extra training courses and experience)	
	Employers are familiar with e-learning systems	
14	E-learning may improve HE because it:	1: Strongly agree
	Is a solution to HE problems	2: Agree
	Is an effective educational way	3: I do not know
	Supports more discussions via online tools	4: Disagree
	Adopts a variety of learning styles	5: Strongly disagree
	Develops computer/internet skills	
	Encourages accessing online updated data	
	Helps in developing learners personality	

5.2 Interviews

Ten semi-structured interviews were conducted with senior academics as a major representative of the e-learning stakeholders. The interview form consists of eight semi-structured questions and one ranking question. Participants were senior staff members working at the AASTMT located in both Cairo and Alexandria branches. Interviews were conducted according to participant's convenience after taking necessary consents. Most interviews were audio taped except if refused by participants. The language used during interviews was mainly Arabic. Translation and transcription of responses are described in the following section. A list of the interview questions are shown below:

- Do you think e-learning is a useful way of learning in HE? Why?
- Do you think e-learning is applicable to Egypt? Why?
- Can e-learning be part of the solution to HE problems in Egypt? Why/How?
- Do you think e-learning will help graduates gain more skills? How?
- What are the skills that e-learning could improve in HE graduates?
- Would you encourage an e-learning program in your university? Why?
- Will e-learning graduates be equally acknowledged and appreciated by the society as traditional graduates? Why?
- Will they have equal job opportunities? Why?

- Please rank the following e-learning criteria based on the level of importance according to your point of view
- Internet connection should be reliableE-learning programs should be useful and effectiveEase to use course electronic materialE-learning certificate should be accreditedCreating societal awareness of e-learning concepts

6 Analysis of data

6.1 Questionnaires

Simple frequencies derived for the questionnaire variables are reported below. SPSS was used to code and analyse data. Chi-square tests were used to assess whether the distributions of results differ significantly by different population segments which might have arisen by chance. If the answers were ordinal, mode calculations was used to analyse the data. Simple regression analysis was also used to determine the relation between different variable categories described before.

6.1.1 Statistical results

Frequencies

- 91.1% of students sampled accessed the internet from their homes, while the rest used other places (e.g. Libraries and Cyber cafés).
- 96% of students use the internet on daily basis, while 3% and 1% use the internet weekly and monthly basis, respectively.
- The majority of the sample under investigation (92.1%) uses the web for educational purposes, while the rest uses the internet for entertainment and other applications.
- A very large percentage of students (89.8%) were aware of e-learning as an educational platform.
- Nearly half of the sample (51.5%) preferred the e-learning in HE.
- 77.2% of students believed that their parent's would encourage them to join an e-learning university and 76.2% of the same sample was sure of their parent's enrolment and funding to an e-learning university.
- The lack of practical work and the admission system to universities was considered as the most significant HE problems as seen by 60.2%.
- E-learning graduates may be more skilful because of the use of updated information sources (44.4% agree and 41.4% strongly agree), more team work (54.5% agree and 35.4% strongly agree) and the acquired search and data gathering abilities (44.4% agree and 41.4% strongly agree).

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- 7.1% strongly disagree and 32.3% disagree that e-learning graduates will not be equally acknowledged by employers because they did not acquire the same knowledge. On the other hand, the majority agreed that they will gain acknowledgement due to the HE authorities' support, with 59.6% agreeing and 14.1% strongly agreeing.
- The majority of students agree that e-learning graduates may have equal recruitment chances due to practical experience acquired (17.7% strongly agree and 58.3% disagree) besides the dependence of employment on factors as training and experience (19.6% strongly agree and 55.7% disagree).
- 43.9% and 38.8% of students agreed and strongly agreed, respectively, that e-learning programs may improve HE because it adopts a variety of learning styles, while 31.6% and 50% of students agreed and strongly agreed, respectively, that the computer and internet skills may be the main reason.

6.1.2 Mode calculations

Raking given to the e-learning success criteria is prioritised according to their importance given by the students:

- accreditation of the certificate
- creating social awareness of e-learning concepts
- easy to use course electronic material
- usefulness and effectiveness of e-learning programs
- reliability of internet connection.

Raking given to the e-learning challenges is prioritised according to their importance given by the students:

- non-real-time feedback to enquiries and assignments
- cultural resistance to change and adaptation to technology
- technological gap (internet speed and bandwidth/computer skills needed)
- establishing and developing reliable
- lack of normal college environment
- lack of face-to-face interaction and close supervision.

6.1.3 Chi-square tests

In order to analyse the data collected, null hypotheses were tested using chi-square to assess whether the distributions of results differ by different questionnaire segments which might have arisen by chance. Interpretations are described below.

 H_01 : There is no relationship between students' e-learning perception and e-learning readiness in Egypt.

Chi-square = 115.789^a (*df* = 4, *sig.* = 0.000). According to the above results, the null hypothesis could be rejected. The interpretation is that there is a relation between the perception and readiness of students concerning e-learning. It could be concluded that an increase in the level of student's perception will directly affect their readiness to adopt e-learning.

H_02 : There is no relationship between students' e-learning readiness and e-learning provision and use in Egypt.

Chi-square = 129.838^a (*df* = 4, *sig.* = 0.000). Again the null hypothesis could be rejected. The interpretation is that there is a relation between the readiness of students concerning e-learning and its provision and use in the Egyptian context. It is clear that student's readiness will have a significant effect on its provision and use in Egypt.

H_03 : E-learning provision and use have no effect on the improvement of HE in Egypt.

Chi-square = 131.970^{a} (*df* = 5, *sig.* = 0.000). The results gained allow us to reject the null hypothesis. The interpretation is that there is a relation between the provision and use of e-learning in Egypt and the improvement in HE. It could be concluded that the provision and use in Egypt will have significant effect on the HE improvement.

6.1.4 Regression analysis

In order to determine the strength of the relationships between HE students perception, readiness to e-learning adoption, provision and use, and HE improvement, questionnaire variables were divided into four main categories: e-learning perception, e-learning readiness, e-learning provision and use, and HE improvement. Regression tests shown in equation: Y = a + bx, where Y is the dependent variable, a is the Y intercept, that is the value of Y when x = 0, b is the regression coefficient which indicates the amount of change in Y given a unit change in x, and finally x is the value for the independent variable. The results are shown in Table 2.

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Dependant (Y-Intercept)	Independent (X-Intercept)	<i>Coefficients</i> $(Y = a + bX)$
E-learning readiness	E-learning perception	Y = 2.766 + 0.218X
E-learning provision and use	E-learning readiness	Y = 1.708 + 0.633X
Higher education improvement	E-learning provision and use	Y = 2.002 + 0.469X

The above results illustrate the impact of e-learning perception of e-learning on the readiness to e-learning adoption, where an increase in perception by 0.218 will cause an increase in e-readiness by this amount. Similarly, the provision and use of e-learning in Egypt is directly affected by the readiness to e-learning adoption, where an increase in e-readiness by 0.633 will cause a direct increase in the provision and use of e-learning. HE improvement in Egypt through the introduction of e-learning programs will be strongly affected by the provision and use of such programs, where an increase in the provision and use of e-learning by 0.469 will cause a direct increase in HE improvement.

6.2 Interviews

Interpretative analysis was conducted to analyse interviews after translation and transcription. Common ideas generated from the interview gained were grouped into main themes that would help in building the views of senior academics. For the ranking question, mode calculations were used.

6.2.1 Results

It was found from interviewing 10 senior academics in business administration and information technology schools in public and private universities that:

- When asked about the usefulness of e-learning as an educational mode in HE, most 1 academics considered e-learning as a useful method of learning in HE due to the advantages it offers. "e-learning offers an education service independent of time and place which can offer an educational service to a large number of students" (Cases 1, 5 and 7) "especially those with job and family conditions" (Cases 2 and 6). "EL encourages students to take full responsibility of their learning, develops internet and computer skills and is seen as cost effective since the costs of learning as transportation for example is eliminated" (Cases 3 and 7). From the interviewee's point of view, e-learning will open new ports of education in Egypt besides solving some of the existing common HE problems as overcrowded classrooms and large tuition fees in private education (Case 4). One of the interviewees (Case 10) considered that the introduction of e-learning in Egypt is essential since it matches the technological revolution that we touch globally. On the other hand, a completely opposing opinion was addressed by one of the senior academics interviewed (Case 9). She believed that the usefulness of the system depends on the efficiency of the service offered. She added that: "students would not have the appropriate experience needed for e-learning that would be enough to keep them motivated".
- Eight out of ten seniors interviewed supposed that e-learning is applicable 2 to Egypt. They claimed that the technological infrastructure in Egypt represented by the increase in the number of internet users, software developers, internet service providers (ISPs) and other resources needed is suitable and available. "The increasing number of students acquiring a he certificate is another important promising factor (Cases 1–4). The applicability of e-learning in Egypt is now more possible especially after the Egyptian revolution and realising the power of the internet and information technology. Therefore, there is more respect for education through the internet (Case 5), which makes our culture more ready" (Case 8). The infrastructure offered by universities and government is a factor highlighted by one of the interviewees (Case 10) that would ease the applicability of e-learning in Egypt. "Spreading e-learning is the great challenge, therefore its applicability will be limited for the time being" (Cases 6 and 10). On the other hand, interviewees who were not convinced of the applicability of e-learning in Egypt believed that students are not yet ready to use this type of education for learning (Cases 7 and 9). "The main problem will be the communication through the internet".

- 3 Almost all respondents (nine out of ten) believed that e-learning could be a part of the solution of HE problems in Egypt. Interviewees stated that e-learning can solve some problems as high-density classrooms, shortage in financial resources and traffic problems (Cases 1, 2, 5, 7 and 10), and hence improving the teaching and learning process (Case 2). "The learning process will be facilitated through giving more opportunities for discussion (Case 3). E-learning could be a way out of problems such as the lack of resources and high tuition" (Case 5). Some of the academics interviewed considered e-learning as a partial solution but on solid basis. "Solid infrastructure and quality of curriculum are factors that should be taken into consideration (Cases 5 and 8). The HE problems in Egypt are spread throughout the different educational majors in Egypt, while e-learning can only be applied in certain applications" (Case 10). E-learning was also seen as an alternative solution to traditional HE only in emergency conditions or crisis (Case 6).
- 4 Most of the senior academic interviewed agreed that e-learning graduates will gain more skills than traditional graduates. Internet, computer and research skills were the most common skills mentioned (Cases 2, 5, 6 and 7). Other skills were also mentioned as group work, independent thinking, self-confidence, expression of ideas and communication skills (Cases 1, 2 and 6). "Self-motivation is another gained skill by an E-learner" (Cases 5 and 9). Case 10 believes that: "E-learners will gain more skills but not in all applications as mentioned before", while Case 4 had a completely different point of view believing that the normal university environment helps students gain skills.
- 5 When asked about the skills that e-learning could improve in an e-graduate, it was totally agreed that e-learning will improve a number of skills in the e-learning graduate. Once again information technology, research, internet, and computer skills were commonly mentioned. Besides, time management, writing skills, language skills and scientific thinking were also stated.
- 6 About the encouragement of e-learning in universities, a large number of academics encouraged the adoption of e-learning in their universities. Their justification was centred around the idea of e-learning as an alternative track to on-campus HE that would increase the number of students registered without overloading universities. "*E-learning could reach some populations of students that were not reachable before*" (Cases 1 and 2). It is also seen as an effective alternative in political or medical situations (Case 2). "*Encouraging e-learning will guarantee gaining the benefits of opening up a new market*" (Case 5) and "will increase the number of *learners without putting more pressure on universities besides helping in and the spread of the educational mission which is the main aim of universities in the first place without any boundaries or obstacles. It is also an additional source of income to universities. If e-learning is implemented effectively it will enhance the reputation of the university offering this service" (Case 6).*

On the other hand, academics opposing this idea clarified that by stating that: "students are not yet ready" (Case 9), "training must be provided first" (Case 7). "Strong technical infrastructure, development of effective course material, continuous help and assistance must be established" (Case 7). One of the deans

interviewed added that: "in order to adopt e-learning in undergraduate programs, experiences from other e-learning pioneer universities must be used and we have to apply it on a small scale at the beginning" (Case 10).

7 Regarding the acknowledgement and appreciation of e-learning graduates, different responses were gained. Some interviewees were quite sure of this point; "self-confidence and self-motivation will give them a step up" (Case 7). Another academic interviewee (Case 8) clarified that: "there are e-learning programs spread worldwide and their graduates are appreciated so there should not be any problems".

A completely opposing opinion was given by one of the academics who believed that e-learning graduates would be seen as less quality graduates regarding the amount of knowledge, skills and education they gained (Case 4). Another point of view was described by a number of academics stating that: "*it is not yet the time for the appreciation and acknowledgement of e-learning graduates*". Case 10 stated that: "*appreciation would not be gained except after the spreading of e-learning and gaining trust from society besides offering a high-quality e-learning service. The culture of job market should be adapted first. Acknowledgement and appreciation are the main challenges*" (Case 1) "*which would be met by applying strict quality dimensions. Mindset concepts about e-learning in a country like Egypt will take a lot of time to change*" (Case 6).

A number of responses were not certain of this particular point. Responses like "not sure", "do not know" "it depends on", etc. were gained. "The labour market is unaware of e-learning as a concept" (Case 2). "Accreditation and awareness might increase the value of e-learning graduates" (Case 5). "A lot of factors will help; accreditation, skills gained, quality of programs and reputation of university will play an important role" (Case 9).

Various responses were gained concerning the recruitment chances for e-graduates. 8 Only one of the academics was quite sure that e-learning will have equal or even more job opportunities. He justified that: "e-learning graduates would have passed through a real challenge which will make them preferred more by employers" (Case 7). On the other hand, another group of academics were positive regarding this point after taking into consideration certain conditions as cultural awareness (Case 7), employment in certain non-practical applications only (Case 8) and accreditation of the certificate (Case 9). A different group of interviewees was not sure of their answers; they stated that: "recruitment depends on a number of factors" (Case 3) "as awareness of employers about e-learning as an educational concept" (Case 2), "skills gained by e-learning graduates" (Cases 4 and 5) and "accreditation of programs offered" (Case 5). Two out of ten interviews were quite sure that e-learning graduates will have less recruitment chances. They believed that the lack of awareness of e-learning at the job market and missing quality standards (Case 1) besides the limited e-learning service offered (Case 10) are the main reasons behind this.

9 Results gained from the ranking question showed that senior academics prioritised the accreditation of the e-learning certificate and creating social awareness of e-learning concepts as the most important. Reliability of the internet connection was the second most important criteria followed by the creation of useful and effective e-learning programs and lastly the use of electronic materials easily.

6.2.1.1 Senior academic themes

- The majority of academics considered e-learning as a useful learning mode in HE in Egypt due to the advantages it offers, while a minority believed that dealing with e-learning needs experience that student's lack.
- Two different themes were discovered. The majority of academics interviewed assumed that e-learning could be easily applied in Egypt; however, spreading it is the main real challenge. On the other hand, respondents disagreeing with this concept justified that student's are not yet ready to use this educational mode.
- Most of the academics interviewed considered e-learning as a partial solution to HE problems in Egypt in the public and private domains; however, factors as the quality of curriculum and strong infrastructure availability should be considered. In addition, e-learning was seen as an improvement tool only in certain non-practical application.
- Although the majority of academics were sure that e-learning will help in gaining more skills and enhancing student's personality besides improving computer and internet skills mainly, it was suggested that the normal college environment is still an important source from which students gain most of their skills.
- A large number of academics encouraged the adoption of an e-learning track in their universities. They considered e-learning as an alternative effective educational track without overcrowding schools. Conversely, a minority supposed that training must be provided to students first besides the application to a small scale of students.
- There was not a clear theme regarding the acknowledgement and appreciation of e-graduates from the job market. Different opinions were gained.
- There was not a clear theme regarding the job opportunities offered to e-graduates from the job market as regarded by senior academics. Different opinions were gained.
- The accreditation of the certificate is prioritised by senior academics.

7 Discussion

As Egypt is a developing country with a high rate of illiteracy, it was expected that HE students would use the internet infrequently. Results gained showed that the majority of students under investigation access the internet from their homes on daily basis. It could be concluded that Egyptian HE students are frequent technology users and there seems to be no problems in accessing the internet.

Since the concept of e-learning is new to Egypt and most of students use the internet on daily basis, it is expected that HE students use the internet for entertainment purposes rather than educational ones, consequently students will not be aware of e-learning as an educational mode due to the very limited attempts of applying e-learning in HE in Egypt and the wide-spread concept of traditional on-campus HE instead. Surprisingly, the results gained demonstrated exactly the opposite; where the majority were found to use the internet for educational purposes and are aware of e-learning as an educational mode. It could be concluded that young adults are familiar with using the internet for educational purposes, which is an encouraging output concerning investigating e-learning perception and adoption in Egypt.

Since the advantages of e-learning program have been clear and obvious, and due to the fact that it has not yet dominated the Egyptian market, HE students in Egypt were not expected to have an inclination towards any learning modes. Results confirm this, where nearly half of the sample prefer on-campus traditional HE. Accordingly, e-learning perceived benefits are not yet obvious for young adults. This shows that the Egyptian culture seems to resist change and fear uncertainty.

It was also expected that parents would not encourage e-learning. Amazingly, only 25% of respondents supported this expectation. The majority of students stated that their parents would encourage e-learning and may provide the needed funds. On the other hand, a large number of academics encouraged adopting e-learning in their universities. They considered e-learning as an alternative effective educational track without overcrowding schools. It could be concluded that a large portion of the Egyptian society is aware of e-learning benefits and encouraging it. The existing problems of HE besides the high tuition fees of private HE are the main reason behind their choices. E-learning is seen as a compromise for HE problems. These results validate those gained by senior academics where e-learning applicability in Egypt and its usefulness are confirmed. The lack of student's experience in dealing with this educational mode still remains an obstacle.

Results achieved from students and senior academics illustrated that there is a consensus regarding the accreditation of the e-learning certificate and creating social awareness about e-learning, respectively, as success factors for e-learning in Egypt. Although e-learning benefits are clear and students are willing to engage in e-learning, the accreditation is the most important factor. This rings the bell for more investigation about e-learning accreditation plans according to the government.

Since e-learning is well established worldwide and Egyptian HE students are aware of it as an educational mode, e-learning challenges were thought to be equally important. Results demonstrated that most of students have seen that non-real-time feedback to enquiries and assignments and cultural resistance to change and adaptation to technology are the most important challenges. This explains that more clarifications are needed from the e-learning service providers to enhance student's perception and increase confidence, assurance and trust. From the students' point of view, the resistance to change should decrease to deal with e-learning.

As HE in Egypt is overloaded with major problems, it was expected that there is no significant difference between various problems mentioned. The result gained proved significant differences between various HE problems. The lack of practical work and the admission system to universities were considered as the most significant HE problems as seen by private HE students. That's why most of the academics interviewed considered e-learning as a partial solution to HE problems in Egypt in the public and private

domains; however, taking into consideration the quality of curriculum and reliable technological infrastructure availability. As a result, e-learning should be regarded as a vehicle that would solve HE problems and thus improves it. The results gained demonstrated that e-learning is seen as a tool for improving only certain points that HE lacks. Adopting a variety of learning styles and developing computer and internet skills may be the main reason as seen by students.

There was a consensus between students and academics that an e-learning graduate would be more skilful than traditional on-campus students especially in computer and internet. E-learning would promote its graduate personality due to the use of recent updated information sources, more team work involvement and acquired search and data gathering abilities.

As e-learning has been implemented worldwide, it was expected that e-learning graduate would have the same recruitment chances as a traditional graduate. Acknowledgement of graduates and job opportunities offered by employers depends on a number of factors, one of which is the certificate offered to graduates. Therefore, the acknowledgement of e-learners and employment chances given to e-graduates is a point that was investigated in this research work as seen by students and academics.

Different themes were gained concerning the acknowledgement and appreciation of e-graduates. Some students believed that offering e-learning certificates from HE authorities would encourage their acknowledgement and appreciation, others believe that e-graduates did not gain the same amount of knowledge needed and will be less acknowledged by employers. Academics interviewed had different opinions too, where some believed that e-learning is spread worldwide and will not be a problem, while others believed that e-graduated would be considered of less quality than other traditional HE graduates. Some academics have highlighted the fact that there are not any e-learning graduates yet, and thus it is hard to judge their quality and differences compared to the traditional learning graduates.

Students believed that e-graduates would have the same job opportunities as traditional ones as a result of the practical skills gained by e-learning graduates especially in computer and internet skills. Similarly senior academics interviewed had various responses concerning this point. There was not a clear obvious pattern in responses gained. However, factors such as increasing cultural awareness and accreditation of the certificate were commonly mentioned. It could be concluded that e-learning is still immature to evaluate the response of employers towards e-graduates which shows that further investigations regarding governmental authorities and labour market are needed to deeply analyse the results achieved so far.

8 Conclusion

E-learning seems to be the upcoming trend. It has been spreading worldwide. However, Egypt has not really begun to take the advantage of the e-learning medium. Although the adoption of e-learning in Egypt can provide a suitable solution to HE problems by filling in the gap between the number of available university places and the growing demand for HE, e-learning in HE has not yet dominated in the Egyptian Market. Although Egypt has already launched its first non-profit private electronic university, the main HE stakeholders still seem to doubt the effectiveness of such a mode. They prefer the traditional on-campus learning mode as a way to avoid uncertainty.

Most senior academics interviewed consider e-learning as a useful learning mode that could easily be adopted. E-learning can partially solve the overcrowded HE classrooms problem in non-practical fields. E-learning is a mode that they would adopt after taking care of certain aspects such as quality of curriculum and students' training. E-graduates would gain more skills mainly computer and internet skills. Academics were not sure about the acknowledgement and appreciation of e-graduates as compared to traditional correspondence. They were not certain about their recruitment chances. The accreditation of the certificate is a priority for all academics needed for the success of e-learning.

HE students are the end users and one of the main HE stakeholders. Their perception and readiness to use e-learning is expected to have a direct impact on the provision and use of e-learning in Egypt. Results gained from previous statistical analysis proved that HE students have some common criteria that are encouraged concerning the adoption of e-learning in Egypt. However, the accreditation of the certificate and awareness of the society towards e-learning concepts including the job market are their main concerns.

Finally, it is now clear that the main challenge that faces the spread of e-learning in Egypt is cultural awareness and accreditation of the certificate offered. Governmental authorities offering e-learning may have the upper hand in creating social awareness to society, where they should announce that e-learning is an equivalent mode that offers HE certificate which is not less in quality than traditional certificates. The rules and regulations on which students are assessed must be clear and known. The accreditation of certificates is a vital point; especially after launching the Egyptian Electronic University to assure society and the job market in particular.

Results have shown that as the stakeholders' perception increases their readiness towards e-learning increases which will consequently increase the provision and use of the new educational platform and thus increases its quality. Therefore, efforts from governmental authorities and e-learning providers are highly needed in promoting e-learning awareness and will increase the e-learning provision and use and thus improve HE in Egypt.

9 Recommendations

The research investigation has revealed that for e-learning to be efficiently utilised in Egypt, a number of recommendations are suggested for HE authorities and academic institutions in Egypt. These recommendations are listed below:

- Promoting the concept of e-learning and its learning techniques to the key stakeholders as students, academics, employers, governmental authorities. Benchmarking with successful implementation of e-learning in similar developing countries is a necessity.
- Development of strategies and plans by higher educational authorities and policy makers to assure that e-learning is an effective alternative route to HE.
- Preparing separate accreditation criteria designed especially for e-learning tracks and the obligation of their implementation if possible, higher educational authorities, policy makers and educational institutions could play an important role in establishing valid criteria that would assure the effectiveness and efficiency

of e-learning to the society. Accreditation of e-learning certificates could be an obligatory condition to all institutions.

- Offering good job opportunities for the first group of e-learning graduates could give a sense of confidence to society, especially if supported by higher education authorities and major employers.
- Offering e-learning scholarships to excellent secondary school students and employers who wish to gain a higher education certificate may encourage awareness among the society and promote the value of the e-learning certificate and educational experience.

10 Future work

Investigating other main stakeholders' perception such as HE government representatives and major employers becomes a normal logical sequence to strengthen the study implications and help in building a complete picture about the readiness and perception of the Egyptian context towards e-learning adoption. These investigations are planned to take place in a larger study from which the study at hand is a part of.

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