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FACULTY OF SOCIAL AND HUMAN SCIENCES

School of Education

Investigating the Efficacy of E-learning for Egyptian Higher Education

by

Tamer Sameer AbdEl-Badea AbdEl-Gawad

Thesis for the degree of Doctor of Philosophy

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ABSTRACT
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Abstract
Using e-learning has become a credited learning delivery method in developed countries. The importance of this research arises from a widespread acknowledgement that implementing and evaluating quality in the learning process, whether it is face-to-face or e-learning, is important to guarantee the success of developing learners’ understanding and knowledge.

The research uses an instrumental case study to investigate the efficacy of e-learning in the Egyptian higher education context and to produce a model of implementing and evaluating quality in e-learning systems. Several methods are adopted including interviews, questionnaire, focus groups, VLE feedback, and a pre-post achievement test to collect the data.

The study describes the participants’ attitudes toward e-learning, what they perceive as quality e-learning systems and as critical success factors for implementing such systems inside the Egyptian higher education, and how they view the effectiveness and quality of e-learning systems. In addition, the study indicates that the majority of the participants are satisfied with using e-learning systems in their learning as long as the critical success factors are applied. This research also suggests that e-learning has a positive impact on learners’ achievement levels.
“The problems that exist in the world today cannot be solved by the level of thinking that created them.”

-- Albert Einstein

Teaching computer-maintenance to Egyptian higher education learners has always confronted with difficulties and problems such as: concentrating on the theoretical aspects and neglecting the pragmatic parts of the curriculum (observed via the researcher’s experience in teaching this particular curriculum); the management restricting computer devices that can be used for maintenance training at the faculty even in the presence of the lecturer; the large number of learners in each session which prohibit learners from practising the skills included in the curriculum; the lack of resources available to the learners; dependence on only one method of teaching in which there is no interactivity at all between the learners, and even between the learners and their instructor; lack of curriculum activities which learners can participate. Thus, teaching computer-maintenance curriculum to Egyptian higher education learners requires searching for the appropriate methods and strategies for delivering the curriculum content in a suitable format to the learners in order to solve the present problems. E-learning represents a relatively new basic method for delivering such curriculum to Egyptian higher education learners; it contains the possibility of resolving a lot of the problems which face Egyptian higher education such as: the quality of learning; access to education and training; the increasing cost of education; and the cost-effectiveness of education. Many researchers have suggested that e-learning has the abilities to solve a lot of these problems (Allen, 2002; Barclay, 2003; El-Zayat, 2000; Horton, 2002; A. Inglis, 1999; Lee, 2005; Sloman, 2002). Therefore, the researcher has a solid belief in e-learning systems as an efficient, quick and affordable solution to Egyptian higher education problems.

This research aims to make changes in the higher education sector in Egypt through submitting new aspects to enhance Egyptian higher education which mainly focuses on teaching the curriculum through paper-based teaching only, therefore by providing a
new method for delivering the curriculum there will be an argument about the efficacy of e-learning in the Egyptian higher education context. This argument will generate questions about the possibilities of e-learning and its benefits, which will be a great accomplishment. To create a dynamic state of thinking about e-learning in a static society like Egyptian higher education is a difficult thing to achieve and if this happens as a result of this research, it will be a breakthrough.

The researcher has chosen participants from amongst Egyptian higher education learners from the faculty of specific education/ instructional technology department/ computer-teacher division for reasons of: ease of access; availability of the required equipment; and official approval and understanding of the nature of the research.

Certainly in countries such as the UK, the problems of using e-learning systems would not be as noticeable as they are in Egypt because the UK has the experience, the possibility and familiarity with using e-learning systems. However, Egypt suffers from a lot of problems confronting the adoption of e-learning systems such as: low education budget; insufficient experience of using e-learning systems; defective computers supply; and old fashioned technology.

As a result of these problems, this research anticipates that e-learning will be relatively inefficient for in the Egyptian higher education sector due to:

- The lack of enhanced technologies.
- The lack of experience in dealing with e-learning systems.
- Ignorance of the importance of transforming the curriculum into e-learning systems within Egyptian higher education institutions.
- Background; as Egyptian educators prefer the face-to-face method to deliver curriculum to any new methods. Egyptian teachers prefer traditional teaching methods because it gives them a lot of control over the learners as well as they become adapted to it. Meaning, they have the tools needed to teach and they do not feel that they need new methods to deliver their curriculum, as it will put an extra duties on their shoulders.
- The public and officials’ ignorance of the importance of e-learning systems.
- The absence of strategic views regarding the usage of e-learning systems as a credited delivery method.
- The defective computer devices inside the Egyptian higher education institutions.

On the other hand, the challenging minds of the Egyptian learners could be an indication for an expected efficiency of e-learning for the Egyptian higher education context, because the researcher believes that they have the abilities to cope with any
kind of technology as long as they have the opportunity and affordances to interact with such technologies.

I realise that facing all these challenges in implementing an e-learning system in the Egyptian higher education context could result in a lot of difficulties for the researcher, but if this study could overcome these challenges to place Egypt alongside countries more experienced in using e-learning systems, then it could truly be said that this research have achieved something.

It is possible that a new theory about e-learning will not be generated nor the face of education changed, nevertheless this research and future research can still be devoted trying to adapt e-learning systems to enhance education at the higher education level in Egypt; changing the perspective of the people and authorities in Egypt towards e-learning; and trying to find an appropriate method to establish and evaluate quality as a criteria of excellence in e-learning systems. Thus I hope my research will be a step on the way to change:

- Peoples’ thoughts about e-learning as a trustworthy method of delivering curriculum.
- The authority’s traditional way of thinking about the best method to deliver the Egyptian higher education curriculum. By starting to adopt new methods to deliver curriculum.
- The Interface of multi-media programs - which are common in Egypt now - into quality e-learning systems through developing a systematic approach (model) to guide future researchers on implementing quality in their e-learning systems.

**Context of the research:**

This research is carried out in the Egyptian higher education context with participants from fourth year grade learners at the computer-teacher division/ Instructional Technology Department/ Faculty of Specific Education/ Tanta University.

The official language of teaching is Arabic. The main purpose of this study is to determine the efficacy of e-learning systems for the Egyptian higher education and to generate a model of implementing and evaluating quality inside e-learning systems.

The Computer-maintenance course is a 2-hour “lecturer” and 4-hour “section” throughout 14 weeks. The curriculum emphasises the fundamentals of computer-maintenance skills. Topics covered by the curriculum expose learners to a range of maintenance skills such as loosening and (re)constructing computer parts and discovering faults in computers.
The e-learning system was designed by using open source VLE builder software (Moodle) that allows the researcher to build the VLE for the computer-maintenance curriculum. The designed VLE includes only two units of the curriculum: the Motherboard and Storage Devices. The Motherboard unit has been chosen because the content relates to most of the computer’s components. The Storage unit was chosen upon the personal experience of the researcher, because the most significant problems facing learners is usually caused by insufficient knowledge of storage devices.

The construction of Egyptian higher education sector

This study is set within the context of the Egyptian higher education sector and based at a typical provincial state University in northern Egypt. There are 17 state Universities (governmental) with 295 faculties and institutes. These universities follow the Supreme Council of Universities, which plans the general policy of university education and scientific research and coordinates among the universities in their various fields of activity. The council is set up under the presidency of the minister of higher education and comprises all university presidents in its membership in addition to five members at most who have experience in the affairs of university education. (Ministry of Higher Education, 2007).

In addition to the state universities, the Egyptian higher education has different types of private higher education institutions including “intermediate private institutions” and “higher private institutions”. Both kinds of private higher education institutes were supervised by the Ministry of Education “Until 1961 when the Ministry of Higher Education came to supervise them. These institutes are owned by associations or individuals. In the eighties and nineties, the number of intermediate and higher institutes increased. However, demand for establishing private intermediate institutes receded because of the expansion in establishing higher private institutes with the students flocking to them in the hope of obtaining a higher education certificate. The number of higher private institutes reaches 109 and intermediate institutes 10” (Ministry of Higher Education, 2007: p. 54).

The Egyptian higher education learning environment has many challenges including: over-population and large class sizes; the severe shortage in the number of teachers; poorly trained teachers with low wages and status; and a centralised, test-driven curriculum focusing on rote memorisation of material. (NCERD, 2001; Warschauer, 2003; UNESCO, 1998; UNESCO, 2003)

The utilisation of technology is a critical issue in Egyptian higher education; both administrators and learners are expecting faculty instructors to incorporate technology into their teaching. This is a developing challenge for the Ministry of higher education. The aim is for e-learning to be a credible curriculum delivery method in the Egyptian higher education sector.
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Chapter 1 ‘Introduction’

My thesis focuses upon an area of research I have always been interested in, which is the idea that computers can do everything on behalf of the user but the main challenge, as I considered it, is in the field of Education: computers can perform human’s tasks in almost every area, but can they teach?

These were my thoughts before I entered the field of Instructional Technology and began to understand that the computer can take one part of the task in what named “blended learning”; and they can change the whole learning environment from a “Face To Face” (FTF) exchange to a “Virtual Learning Environment” - as one of the e-learning terms - . This could help learners to be on their own during their learning process, Heppell (2007) said that: "Learning is breaking out of the narrow boxes that it was trapped in. VLEs are helping to make sure that their learning is not confined to a particular building, or restricted to any single location or moment". VLEs supported learning by providing the resources (Woollard, 2011: p. 30). This supporting process of learning is known by different terms for example; “computer-based learning”, “Online instruction”, CAL, CML, LPs, MLE, CMS, LMS, etc., Woollard (2011: p. 3) presents a good comparison between e-learning and other terms which used interchangeably. Thus whatever the terms used to identify e-learning, it will always have a core meaning “using networks to administrate and support learning and learners”.

Kearsley (1998) stated “Online instruction is defined as any form of learning and/or teaching that takes place via computer network”.

(Mason, Rennie, & NetLibrary, 2006: p. 124) identifies VLE as “the mix of hardware and software that is used to create online learning opportunities" and they looked at it as an attempt to emulate all aspects of the learners’ learning environment, but in an online manner using ICT and, normally, a computer network such as the internet or a college/university intranet. Thus, the researcher is going to use the terms e-learning and VLE as equal.

European Commission (2001) defined e-learning as “the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaborations”.

E-learning systems use the computers’ abilities to mimic the ordinary learning environment whilst making all the learning operations virtual. Meaning, everything that the learners need, they will find between the virtual walls of the e-learning environment.
This research is focusing on the area of e-learning quality and the main concern of this research is not to identify this term but to search for suitable methods of measurement to clarify whether an e-learning system has a quality of learning according to a suggested model of e-learning quality. The researcher designed and implemented an e-learning system (VLE) to teach two units from the computer-maintenance course to the fourth year grade learners /computer-teacher division/ Instructional Technology Department/Tanta University and put the proposed e-learning system under real and hard test in the Egyptian Higher Education context in order to clarify; the validity and suitability of the suggested model and to what extend that model could guide researchers in building and evaluating quality in their own e-learning systems.

**Research questions:**
1. What is the suggested model to guide design and evaluate quality in e-learning systems?
2. What is the efficacy of the suggested model in designing and evaluating quality in e-learning systems?
3. What is the efficacy of using e-learning in the Egyptian higher education context?
4. What is the effectiveness of the suggested e-learning approach on learners’ achievement level in the computer-maintenance curriculum?
5. What is the effectiveness of computer-maintenance e-learning system on learners’ satisfaction toward e-learning as a delivery method?

**Research aims:**
1. Generate a model for implementing and evaluating quality in e-learning systems.
2. Create an e-learning system for the computer-maintenance curriculum.
3. Indicate whether this e-learning approach is effective on learners’ achievement levels or not.
4. Indicate whether this e-learning system has a positive effect regarding the learners’ attitudes toward e-learning or not.
5. Indicate what affects the learners’ preferences for one type of learning delivery method over another.
6. Create suitable combinations of measurements to insure the quality of e-learning.
Significance of the Study:

The purpose of this research is to: examine the efficacy of e-learning systems for the Egyptian higher education; and present practical recommendations to establish, enhance, strengthen, and evaluate quality in e-learning systems. Therefore, this research gains its importance from:

1. Seeking to investigate how to accomplish and evaluate the quality of e-learning systems.
2. Its unique structure to investigate the efficacy of e-learning systems in the context of Egyptian higher education;
3. Constructing a model for implementing and evaluating quality in e-learning systems;
4. Establishing a group of critical success factors (CSF) for implementing e-learning systems in the Egyptian higher education context;
5. Being a step forward in applying the benefits of e-learning systems.

An outline of each chapter is provided below.

Chapter 2: What are the values of e-learning, quality in e-learning and what is the suggested e-learning quality model?
This chapter reviewed literature to address the terms of e-learning; what it means; what its values are; its historical background; how it can be used for educational purposes?

Then the term “Quality in E-learning” is discussed attempting to investigate the criteria involved with establishing and evaluating quality in e-learning systems.

Chapter 3: Research Design and implementation
This chapter discusses the research design in detail including an examination of how both quantitative and qualitative methods were used to provide the necessary data to judge the efficacy of e-learning for the Egyptian higher education and to investigate the efficacy of the suggested model to implement and evaluate quality in e-learning systems.

Then the chapter describes the processes of implementation, data collection and the elements that could have affected the collection of data and also the software used for the statistical analyses.

Chapter 4: Results and Analysis
This chapter describes the results and the analysis highlighting the used analysis framework, which lead the analysis process for both quantitative and qualitative data reaching to the findings of the research.
Chapter 5: Discussion
This chapter builds on the results from the analysis stage at chapter 4. There is a discussion about the effects of the suggested computer-maintenance e-learning system on learners’ achievement levels and on their satisfaction with the implemented e-learning system. Consideration is given to the topic of e-learning quality, how it could be achieved and what are the suitable methods to evaluate such quality.

Chapter 6: Conclusions, Implications, and Recommendations
This chapter tries to finish the story of implementing e-learning inside the Egyptian higher education sector. As a result of literature reviews, academic discussion (presentations), and the empirical evidences of analysis, a model for implementing and evaluating quality in e-learning systems is presented. In addition, the implications of this model and the study limitations will be discussed. Finally, recommendations for future research will be proposed.
Chapter 2 ‘Literature Review’

The proper artistic response to digital technology is to embrace it as a new window on everything that’s eternally human and to use it with passion, wisdom, fearlessness, and joy.


E-learning is a relatively new method for delivering teaching, and as a new method it needs to be used fearlessly to make the most out of it. Thus, this chapter reviews the literature and examines some of the potential issues and concerns in an e-learning environment through an assessment and re-evaluation of the current situation of e-learning systems, in order to define the quality in e-learning systems and determine how it can be established and evaluated.

The purpose of the literature review is to identify the current theories and practices relating to e-learning, and to be more specific, the ones relating to quality in e-learning systems. It aims to define the “domain” of quality e-learning, and to identify the features of the processes involved. It examines:

- The values of e-learning;
- Perspectives on e-learning systems;
- Critical success factors for implementing classless e-learning into the Egyptian higher education context;
- How quality could be accomplished in e-learning systems;
- Quality in e-learning systems (suggested model).

The aim was not to arrive at an overall definition of quality in e-learning systems; the challenge is to identify what exactly is the contribution of technologies to formal learning? This means asking: where do technologies actually make a difference in terms of quality learning? What can e-learning systems do differently which is not better done in the traditional way? This means two main theoretical undertakings must be connected:

1. Identifying what counts as a quality e-learning system;
2. Identifying quality e-learning system processes within the large framework of learning in higher education in order to be understandable.

In relation to (1) identifying what counts as a quality e-learning system, there are considerable differences in the literature, based on views concerning pedagogical
issues as the powerful engine for generating quality in e-learning systems, while others concern technology as the primary concern in e-learning systems. As a result the research generates quality e-learning critical success factors (CSF) to clarify the distinct between quality and non-quality e-learning systems.

In relation to (2) a framework emerged to be considered as a contextual basis (model) for generating and evaluating quality in e-learning systems, which will be discussed in the following sections.

The values of e-learning;

It has become clearer that ordinary paper-based learning suffers from a lot of problems until it became more like the cureless patient, thus educators have looked for new methods to deliver their teaching; ways of delivery that meet their expectations and fulfil their teaching aims. Thus most of the recent educational development studies try to use, evaluate, enhance, and generalise these new methods of delivery which has been variously named with terms such as: “Internet-based learning”, “Online instruction”, CAL, CBL, CBA, CML, CAI, CAA, etc., which could be referred to as “forms of teaching, training, or tutoring” (Woollard, 2011: p. 3).

Whatever the differences regarding the suitable term to use, in order to identify this new way of delivering the curriculum, one constant remains: tutors are delivering their teaching electronically through the web; that is what makes it preferable to call this method; E-learning.

In order to get to know what is behind this term it is not enough to find a name for it, rather its aspects must be identified and its effects on the learning process and learners clarified as well.

It is important to uncover the effectiveness of e-learning on learners’ achievement levels. Identifying how the e-learning delivery format affects learning outcomes and learners’ satisfaction has become an important research topic for researchers and practitioners in Higher Education. (D. H. Lim, Morris, M. L., & Kupritz, V. W., 2006; Selim, 2010)

In addition to identifying how e-learning affects learners’ achievement and satisfaction this research also tries to capture the matrix of elements that influence the quality of e-learning, defining how they could be addressed in designing and evaluating e-learning systems.

Elements regarding e-learning from the early stages to its current state will be reviewed, in order to reveal any misunderstanding about the terminology and ideas. It will also reveal how the research dealing with the subject of e-learning developed.
Perspectives on E-learning

It is important to reach an understanding regarding the term "Learning" before getting involved with the term "E-Learning". Learning is defined as a relatively permanent change in an attitude or behaviour that occurs as a result of repeated experience (Kimble, 1963). Thus with e-learning the same outcomes are expected but they will be achieved electronically.

At the beginning it is clarified that the term e-learning has been adopted by a number of different learning constituencies: work-based training, higher education, vocational education and schools, and policy makers. Each group brings its own particular emphasis, priorities, expectations and understandings. Despite the different terms used to describe e-learning, it all comes back to the usage of internet in learning.

Online instruction is defined as any form of learning and/or teaching that takes place via a computer network (Kearsley, 1998). As a result of the appearance of multimedia the European Commission (2001: p. 2) defines e-learning as “the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaborations.” This definition considered one of the first to highlight the relationship between e-learning and the quality of learning.

Other researchers insisted on including the adjectives of e-learning into the definition such as Raab (2002: p. 221) who identified e-learning as “a learning situation where instructors and learners are separated by distance, time, or both.”, while others advocated their definition to the effectiveness and advantages of online instruction. Online instruction addresses the issue of time and place constraints on delivering learning experiences to distant learners and allows flexible learning modes so learners can control their learning path, pace, and contingencies of instruction (Hannafin, 1984).

Morrison and Khan (2003: p. 2) defined e-learning as “an innovative approach for delivering electronically mediated, well-designed, learner-centred and interactive learning environments to anyone, anywhere, anytime by utilizing the internet and digital technologies in concern with instructional design principles”.

Khan’s definition of e-learning has brought one of the most significant contributions to e-learning definitions simply because it combines the practical part with the theoretical part in one simple definition. Furthermore, it includes many of the possible affordances of e-learning in the definition. As a result of this review one can use the term “e-learning” equally with other terms like “Distance Education”, “Web-Based Instruction”, “Online Instruction”…, because they are all names for the same purpose, “a term comprising one letter representing a physical property of technology (e for
electronic) and the hoped-for outcome (learning) for one participant in the interaction” (Thompson, 2007).

Advantages and values of e-learning

As a result of the many possibilities that e-learning have, it is important to seek the answer of the next question: What the “e” is going to add to our learning? Pachler (2009: p. 4) answers this question as follow:

1- Speed:
   - Speed of response is often important in enabling feedback to have an effect;
   - Support rapid interaction - the ability to give feedback quickly means that the student’s next problem solving iteration can begin more quickly.

2- Processing:
   - Automation: in some situations the e-assessment system can analyse responses automatically and provide appropriate feedback;
   - Scalability: can often be the result of some level of automation;
   - Adaptivity: systems can adapt to learners.

3- Communication:
   - It enables rapid communication of ideas across a range of audiences;
   - This communication aspect means that aspects of the communication can be captured and given a degree of semi-permanence;
   - This semi-permanence supports the sharing of intellectual objects.

4- Construction and representation:
   - Representation: the ability to represent ideas in a variety of ways and to move between and translate these representations;
   - Technology can support learners in the representation of their own ideas;
   - Through representation, technologies enable concepts to be “shaped” and this helps learners develops their meaning;
   - In representing their ideas in digital artefacts learners open up a window on their thinking;

5- Mutability: shared objects are not fixed; they can change/be changed easily.

E-learning considered a method of delivery that has a lot of potentials in the education criteria, many researchers focused on the benefits of e-learning such as: Bouhnik (2006: p. 299) who stated “e-learning has four advantages including:
• Freedom to decide when each online lesson will be learned;
• Lack of dependence on the time constraints of the lecturer;
• Freedom to express thoughts, and ask questions, without limitations;
• The accessibility to the course’s online materials at learners’ own election.”

Furthermore, Capper (2001: p. 8) identified “e-learning benefits as:

• Any time: A participant can access the learning program at any time that is convenient;
• Any place: The participants do not have to meet;
• Asynchronous interaction: Interactions can be more succinct and discussion can stay more on-track;
• Group collaboration: Electronic messaging creates new opportunities for groups to work together by creating shared electronic conversations and discussions;
• New educational approaches: Many new options and learning strategies become economically feasible through online courses.”

Moreover, one can notice more advantages of e-learning such as:

• Reducing the costs of education.
• Reducing the technophobia of the learners.
• Encouraging learners to learn more and faster.
• Improving the equality of learning opportunities by reinforcing various learning styles and supplying a wide range of activities that suit all kinds of learners. For example it includes those best at working individually, cooperatively or collaboratively, and recognises preferred learning approaches including kinaesthetic, verbal or visual.
• No user “ramp-up” time: With many people already on the web and comfortable with browser technology, learning to access e-learning is quickly becoming a non-issue (Rosenberg, 2001).
• Support localisation (including the local languages) (Weller, 2006: p. 102).

At the same time, Cantoni (2004: p. 336) pointed out that e-learning is usually less expensive to deliver; it is self-paced (usually, e-learning courses can be taken whenever necessary); it is faster (learners can skip material they already know); it provides consistent content; it works from anywhere and anytime; it can be updated easily and quickly; it can lead to increased retention and a stronger grasp of the subject (because of the many elements that are combined in e-learning to reinforce the message, such
as video, audio, quizzes, interaction, etc.); it can be easily managed for large groups of learners, creating interaction that engages the attention; provides immediate feedback; learners can customise the learning material to their own needs as they have more control over the learning process and the possibility to better understand the material; learners may have the opportunity to enter a risk-free simulation environment in which they can make mistakes without directly exposing themselves.

In addition e-learning have proven its efficacy in developing learners’ knowledge and independently. “Many lecturers indicated that e-learning had been effective in helping learners to independently manage their own learning and in developing and reinforcing knowledge (understanding).” (Golden, 2006: p. 33)

As a result of the endless possibilities and advantages which the “e” could add to ordinary learning, many changes in the field of education have happened especially regarding overcoming the boundaries of geographical locations. The advancement of online instruction has opened a new area in distance education and contributed to the expansion of the educational opportunities by reaching people in various geographical locations thereby allowing learners global access to education (Heinich, 2002).

One of the most powerful affordances of the e-learning system is its ability to adopt collaborative and personalised learning styles; an argument between researchers arose regarding the best style to use in e-learning (CAUDIT (Council of Australian University Directors of Information Technology), 2010; Selim, 2010; Woollard, 2011).

Many e-learning researchers are focusing on interaction and collaborative learning as important affordance of e-learning and as key elements in high quality educational experiences, while others consider personalisation as the most appropriate method to follow in e-learning systems. This is a big issue for debate because a number of online education researchers, including Harasim (1989), Hiltz (1994) have been exploring interaction and collaborative learning in computer-mediated communication (CMC) for almost twenty years without any clear proof that collaborative learning is any better than personalised learning.

The defenders of interactivity and collaboration argue that it is the instinct of learners to be collaborative and they demonstrate results, obtained via a lot of research relating to ordinary paper-based learning, that reinforce the collaborative style of learning. While the other side argue that e-learning is a self-efficacy learning style, where everything relies on the learner’s ability to learn alone and therefore it has to be a personalised learning environment to be adequate for learning alone.

Garrison (2003: p. 41) stated “Interaction is the defining component of the educational process and occurs when learners transform the inert information passed to them from another and construct it into knowledge with personal application and value.”
Many scholars identify various types and different levels of interactivity (Jonassen, 1998); (Rhodes, 1985); (Schwier, 1993); (Sims, 1994); (Sims, 2001) They include: learner and learner; learner and teacher; learner and content; and learner and interface.

The Institute for Higher Education Policy’s Quality on the Line report recommended that Web-based courses should be designed to “require learners to work in groups utilizing problem-solving activities in order to develop topic understanding” and to use materials that "promote collaboration among learners."(Institute of Higher Education Policy, 2000)

Yet designing online courses solely for the purpose of having collaborative or problem-solving activities should not be the primary goal of any instructional designer. Thus designers and providers for online education must first “determine the vision and goals for the learning experience, as well as how theoretical commitments to teaching and learning can guide their design” (Duffy, 2004: p. 321).

The researcher could argue that the strength of an e-learning system is in its ability to host a whole range of learning styles, whether you love to work in groups or prefer to work alone, you will find what you are looking for inside the e-learning systems.

**Challenges of e-learning**

Most learners in the advanced world are accustomed to use e-learning systems, and are comfortable with the idea of computer mediated teaching at least some of the time. However, what is not so commonplace, at least, not yet, is the use of technology to automate the assessment of students’ performance.

In spite of the many promising features of online instruction, its capability to engage learners in learning events unless the learners are self-motivated and active learners (Daniels, 2000) and have strong organisational skills in their learning habits for successful learning are limited (Oh, 2005). A sense of belonging or community is often reported lacking during online learning experiences, preventing the development of shared feelings and emotions between learners and instructors. Research indicates that a high rate of learners who commence e-learning courses do not finish them (Dutton, 2002).

These suggest that there is something wrong with the e-learning systems. These systems require an in depth look to uncover and understand the reasons why learners are often dissatisfied with their e-learning experiences and therefore do not finish them.

Bouhnik (2006: p. 300 ) contended that student’s e-learning dissatisfaction could be caused by the following:

- Lack of a firm framework to encourage learners to learn;
• A high level of self-discipline or self-direction is required;
• Absence of a learning atmosphere in e-learning systems;
• The distance-learning format minimises the level of contact, as well as the level of discussion, among learners. In other words, e-learning lacks interpersonal and direct interaction among learners and teachers.
• The learning process is less efficient. When compared to a face-to-face learning format, e-learning requires learners to dedicate more time to learning the subject matter.

Nkhosi & Marshall (2009: p. 273) defined what went wrong with e-learning systems in the University of the West Indies was due to the learners missing the face-to-face interaction; there was not enough communication between them and tutors; the slow response of tutors and the problems with getting grades; and the time it took to get accustomed to the new environment, which many described as impersonal.

Regarding the last argument about the challenges of e-learning one can note that there are few challenges which e-learning did not manage to overcome such as: the lack of interaction between the tutor and the learners and between the learners themselves; the dedication required from the learners; the high numbers of learners dropping out from the system; and the insufficient tools for evaluating the skills development of the learners.

Critical Success Factors for implementing Classless E-Learning in the Egyptian Higher Education

The Arab countries have witnessed, as never before, a remarkable trend to enrol into higher education sector (UNESCO, 1998). This increase is driven by the enlarged population and the growing demand for education by people; and the governments’ commitments to increase the accessibility to higher education (UNESCO, 2003). In addition, the rise of unemployment in Egypt has forced a lot of high school learners to apply for higher education hoping to maximise their opportunities to find employer and better prospects for employment.

The challenge is that Egyptian educational institutions do not have sufficient financial resources to expand their facilities to be able to accommodate the increasing numbers of learners. Moreover, the challenge of providing flexible and lifelong learning opportunities has spread the perceptions that Egyptian higher education institutions are not capable of coping with the new demands of their societies. Hence, Arab countries have adopted radically new visions in order to enhance their educational systems. One of these visions is e-learning. In response to the growing demands for higher education, e-learning initiatives have been adopted in countries like Egypt,
Saudi Arabia, Jordan, Lebanon, Palestine, United Arab Emirates, and Bahrain (UNESCO, 2002). These initiatives face many challenges and boundaries which could prevent the successful integration of new technologies into the educational system as they hope. Hence, it is understandable why the level of quality in the e-learning systems in the Egyptian higher education is not as high as expected nor required by a developer’s education service.

Leggett & Persichitte (1998) identified five categories of barriers to technology integration (TEARS): “T” time (to plan, collaborate with peers, prepare lessons & materials, explore, practice, evaluate, develop, maintain and expand skills); “E” expertise (technology training must be: available, hands-on, systematic, on-going); “A” access (must have uninterrupted, on-demand—inside & outside classroom); “R” resources (to purchase, maintain, upgrade technology, training, support); “S” support (administrative & technical). In addition, Antonacci (2002) added self-efficacy to the boundaries of integrating modern technologies into learning.

The Egyptian learning environment suffers from the same challenges and more, which many researchers have identified including: over-population; large class sizes; the severe shortage in number of teachers; poorly trained teachers with low wages and status; and a centralised, test-driven curriculum focusing on rote memorisation of unimportant material. (NCERD, 2001; Warschauer, 2003)

Faculties’ utilisation of technology is a critical issue in higher education; administrators and learners are expecting faculty instructors to incorporate technology in their teaching. Showing case the similar examples could highlight some of the challenges that this research could come up with solutions for them inside the Egyptian higher education sector; For instance, Yaghoubi et al. (2008: p. 90) defined many critical problems that face the transaction process from traditional education into a modern one in the Iranian society which could be summarised as following:

- Lack of realistic comprehension concerning the process of learning
- Ambiguous understanding about learners' educational needs in different levels
- Defective implementation of computer hardware and software
- Weak IT education
- Weak IT infrastructure
- No realistic point of view or strategic programme for higher education
- Budget and equipment shortages
- Influential atmosphere of political, social and economic situations
- Lack of information literacy
The researcher’s suggestion is to identify “classless e-learning” as a means to facilitate the smooth integration of modern technologies inside the Egyptian higher education. AbdEl-Gawad (2010: p. 1) defines “Classless e-learning” as an idea that crossed the researcher’s mind during the praying time. The talking was about the pilgrims and their standing over the mountain ‘Arafaat’ wearing the same two simple sheets that cover their body without any discrimination between poor and rich or educated and ignorant. The idea of equality among the Muslims that driven me to think about e-learning as a possible method of delivering learning to all learners without any distinctions, regardless of their learning style and preferences, or background and prospective perception. To be able to address all the possible audience, this is named “classless learning”.

Current efforts in the Egyptian higher education:
Egyptian higher education does not embrace e-learning as an official learning delivery method. Abdel-Wahab (2008) noted (Beckstrom, 2004) explanation that the Supreme Council of Universities provided no accreditation for any educational programmes supported or delivered through e-learning. Although, this official non-recognition of e-learning as a supported learning delivery method inside the Egyptian higher education. There are some developments in the Egyptian learning environment as a general. Since the beginning of 1994, the ministry of education has established “Technology Development Centre” (TDC) which has grown since then to include more than 600 full-time staff by 1999. (Warschauer, 2003)

This TDC arisen the awareness among educators with the importance of technology integration into the educational environment. This awareness was accompanied by the gradually growth of Internet users in the Egyptian society. In its latest report regarding the numbers of Internet users in Egypt, the UN agency for information and communication technologies reported that the number of Internet users in Egypt in 2009 are “16636000” users with a percentage of 21.1% of the Egyptian whole population (ITU, 2009). In addition, the next table will show the percentages of internet users with regard to the whole population in Egypt from year 2000 till 2009. (See table “1”)

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Users</th>
<th>Population</th>
<th>% Pen.</th>
<th>Usage Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>450,000</td>
<td>66,303,000</td>
<td>0.7 %</td>
<td>ITU</td>
</tr>
<tr>
<td>2006</td>
<td>5,100,000</td>
<td>71,236,631</td>
<td>7.0 %</td>
<td>ITU</td>
</tr>
<tr>
<td>2008</td>
<td>10,532,400</td>
<td>81,713,517</td>
<td>12.9 %</td>
<td>ITU</td>
</tr>
<tr>
<td>2009</td>
<td>16,636,000</td>
<td>78,866,635</td>
<td>21.1 %</td>
<td>ITU</td>
</tr>
</tbody>
</table>

Table 1 Internet Usage and Population Growth in Egypt
The last demonstration of the increasing numbers of Internet users in Egypt give a hope that Egypt will be capable of adapting e-learning as a delivery method, and it gives an indication that Egyptian have got the abilities to effectively engage with the e-learning once it is decided to be among the credited methods to deliver Egyptian higher education curriculum.

As a result of these potentials, the ministry of communication and information technology explained that “in addition to, providing quality education for all, preparing young people to the global market, developing competitive skills geared towards exporting services, the EEI higher education track plan is implemented across 17 public universities complementing the efforts of the Ministry of Higher Education to accomplish the next objectives:

- To increase access to technology
- To qualify universities staff, and administrators to use Information Technology efficiently
- To promote e-learning as a basic component in the higher educational process to overcome the challenges related to large numbers, diversity and special needs
- To integrate and activate the ICT pillar in the reform of faculties of education”

Abdel-Wahab (1967: p. 157) stated “in order to provide the growing population of Egypt with quality, accessible, and abundant educational opportunities, both the government and the private sector are eager to develop alternative programs and delivery methods.”

An e-learning unit at Mansoura University was established in 2005 to promote and encourage the use of e-learning in teaching and learning, and other scholarly pursuits through a variety of academic activities. Clearly, e-learning at the University of Mansoura is at its early stages (Glaser, 1967: p. 157).

It is clear right now that e-learning in Egypt is in its early stages. Government conferences, educational organisations and educators have noted that more systematic research is needed to develop the theory and practice of this system according to the Egyptian circumstances. It is also mentioned that the last government paid a lot of attention to this kind of education delivering systems as it is considered to have the potentials to provide the kind of quality learning that represents one of the country's priorities. Thus, the government has sponsored a number of researchers to study e-learning in countries which are considered to be pioneers in this field. The researcher is one of those who have been sponsored to study in the UK.
Despite impressive advances in hardware and software affordances, the problem of underutilised new technologies continues. Thus, it is important to understand how quality in e-learning systems could be embraced by the educational institutions and their learners.

**How quality could be accomplished in e-learning systems;**

In order to evaluate e-learning systems, a series of evaluation processes should be established to inshore that the designed e-learning systems will be efficient. On the contrary of the many voices asking for the necessity of evaluation, one can notice that "there are voices calling for not to concentrate on evaluation because:

- Evaluation is too expensive and difficult. Many training organizations believe they lack the budget, time, or skills necessary to mount an effective evaluation program without endangering their primary mission of conducting training;

- Results will be meaningless. Many in training fear that all the effort of an evaluation program may be pointless as it is nearly impossible to accurately gauge the effectiveness of training. Some feel that benefits are too subjective and ephemeral to measure and that they take too long to accrue;

- Irrelevant factors dominate results. Training can fail for reasons other than the training product itself. Real world results have many causes.

- Evaluation is too political. In a highly contentious organization, the idea of evaluation can set off political battles and organizational paranoia". (Hoyle, 2006: p. 2)

From my point of view; Quality in e-learning systems is a mixture of elements of satisfaction:

- Stakeholders' satisfaction with the e-learning system;
- Authorities' satisfaction with e-learning outcomes;
- Communities' satisfaction with regard to the sociological impact of e-learning on learners;
- Work market's satisfaction with regard to the abilities of graduated learners from e-learning systems.

The term “Satisfaction” could be defined as the “Confident acceptance of something as satisfactory, dependable, true, etc.” (Ssemugabi & Villiers, 2007)

This research adopted the usage of the term Satisfaction because despite being satisfied with the system, it includes recognition of both the advantages and disadvantages of using e-learning systems which could benefit the researcher in defining the criteria which would determine the quality of e-learning systems.
Critical dimensions of quality in e-learning systems:

E-learning is defined as “the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaborations” (European Commission, 2001). This could be an indication to declare that the invention of e-learning was meant to enhance the quality of learning in general and in order to ensure the quality of learning. It is important to investigate the inner quality of e-learning systems to guarantee that they have the desired effects over the quality of learning as a general.

E-learning quality has critical dimensions to address in order to accomplish the desired quality of learning:

- Technological dimension;
- Design dimension including (instructional design, interface design, pedagogical issues, learning activities, learning style);
- Policy dimension.

Technological dimension:
Lim et al. (2006: p. 1) stated that the origin of online instruction is distance education. One can note from the related literature four generations in the development of online instruction: (a) printed instruction, (b) early technology in broadcasting systems, (c) online instruction, and (d) web-based teleconferencing (Morabito, 1999).

Whereas one can notice that in the last 150 years distance education has “evolved” through four generations, beginning with correspondence study, through those characterised by the mass media (television and radio), synchronous technologies (video- and audio-conferencing), and computer conferencing, to the emerging fifth generation, “the educational Semantic Web” (Thompson, 2007).

One can notice that before the appearance of the World Wide Web there were a lot of differences between the terms (distance education, computer-based training, and computer-assisted learning), but the appearance of the World Wide Web in the early 1990s has eliminated a lot of these differences and brought about the appearance of new terms such as (on-line instruction, online learning, MLP, MIE, CAL...etc.) Which could all be referred to with the term “e-learning”.

Stakeholders are all the parties involved in the e-learning system.

Authority in this research means the ministry of higher education.
According to O'Mahony (2004: p. 685) a number of factors have assisted this perception such as: Increasingly sophisticated web browsers; increasingly sophisticated web scripting languages; increasing bandwidth, improved data compression techniques; increased access to powerful personal computing devices; and increased levels of user knowledge and understanding.

The most significant issues which could be observed in the early e-learning initiatives were: the intensive focus on technology (Holt, 1995; Taylor, 1996), that is, the “e” aspect of e-learning, the digital software and hardware technologies that lead current information, communication and network environments; they have been largely based on traditional concepts of teaching and learning (Coman, 2002; New Zealand Council for Educational Research, 2004). The traditional pedagogy, a content-centred approach, relies on the delivery of information to learners (New Zealand Council for Educational Research, 2004; Newton, 2002). Accordingly, technologies were employed (e.g. video, audio or audio-on-demand etc.) to facilitate one-way communication via the internet. This first phase of online instruction largely emulated the traditional teaching environment in the new digitally connected environment.

Due to the technical limitations of networks and servers, learning institutions’ adoption of Web-based technologies environments led to omission or misuse of much of the richness of interactive possibilities of online instruction (Crisp, 2002).

The mass-usage of e-learning systems and the tremendous volume of research conducted to find out how to benefit from the new technologies and discover suitable pedagogical approaches to be used in e-learning systems, led to the discovery of many significant trends associated with innovations in e-learning such as: technologies which increase the level of synchronous and two-way interaction and communication at a distance, over internal networks and the Internet; one-to-one and one-to-many media-rich technologies including video, audio, simulation and 3D immersive environments that is, wireless, mobile and satellite technologies, connecting with the Internet through TCP/IP (Transmission Control Protocol and Internet Protocol) and Bluetooth. Alexander (2004)

One of the most significant technological advancements was the invention of (Web2) which has been identified by its inventor Tim O’Reilly as: “

- Services, not packaged software, with cost-effective scalability;
- Control over unique, hard-to-recreate data sources that get richer as more people use them;
- Trusting users as co-developers;
- Harnessing collective intelligence;
Leveraging the long tail through customer self-service;

Software above the level of a single device;

Lightweight user interfaces, development models, and business models.”

(O’Reilly, 2005)

Kwan et al. (2008: p. 63) advocate that “the affordances of Web2 will: place emphasizes more on open communication, freedom to share and re-use, decentralization of authority, the market as a conversation, and a sense of civic responsibility. Internet social network, or online communities.”

Many benefits are afforded by Web2 but no opportunities come on a silver platter, each opportunity comes with its responsibilities and challenges. Kwan et al. (2008: p. 2) stated “Apart from the wider socio-political challenges, there are also the more technical challenges related to the introduction and use of new educational technologies. For instance, the sheer range of new technologies present challenges in making correct selection decisions for specific learning tasks. This is further complicated by the existence of a wide range of software and limitations in infrastructure and resources available to higher education institutions”.

To conclude this- the technologies element of e-learning systems- It is worth saying that e-learning has benefited from the new technologies that have arisen throughout its innovation and development; from the initial phases of mimicking traditional instruction pedagogically to the breaking down of the old limited approaches (content-centred approach, the delivery of information to learners, etc.). As a result e-learning systems have provided more freedom via interactive, independent, trust based approaches however they are difficult to design.

The reasons for the challenges in the area of design could be: the difficulties of coping with the freedom of the users to use the system periodically; the difficulty of formatting an interactive approach that can adapt to all the users with their different learning styles; the massive amount of resources available on the internet (which make the designer feel whatever the number of resources included in the e-learning system it will still be limited). As a result of the previous review, it has become clearer that technology is not a stand-alone criterion in establishing the desired quality in e-learning systems.

**Design dimension:**

Designing an e-learning system is a complex process; it is not simply a process of gathering as many web resources and activities in one environment as possible. It exceeds this to mean designing and constructing a complete virtual learning environment for learners. Thus it is crucial to e-learning designers to understand the
preferences of the learners in order to try to fulfil their needs while designing the system.

To investigate learners' preferences for e-learning environments, the Preferences for Internet Learning Environment Survey (PILES), developed by Chuang and Tsai (2005), was administered. PILES were presented in a 5-point Likert mode, including the following eight scales, with a sample item provided:

When navigating in the internet-based learning environments...

1. Ease of use scale: I prefer that they are easy to use.
2. Relevance: I prefer that they present information that is relevant to me.
3. Multiple sources: I prefer that they can connect to rich web resources.
4. Challenging scale: I prefer that they make me think.
5. Student negotiation scale: I prefer that I can get the chance to talk to other learners.
6. Inquiry learning scale: I prefer that I can design my own ways of investigating problems.
7. Reflective thinking scale: I prefer that I can think deeply about new ideas.
8. Epistemological awareness scale: I prefer that they can explore the nature of knowledge deeply.

The reliability for each scale was high (alpha ranging from 0.85 to 0.93). Learners having higher than average scores on the scale showed stronger preferences for the specific features of internet-based learning environments.

Each of the above scales is an important point to consider and aim to fulfil when designing a quality e-learning system.

In order to capture the multidimensional issues regarding the design of quality e-learning systems the next pages will discuss the sub-dimensions of designing a quality e-learning system.

**Instructional design:**

One could argue that ordinary (FTF) learning has benefited a lot from psychology and its learning theories, the following represents a discussion regarding this point of view to investigate whether e-learning has benefited from it or not?

In the early stages of any learning environment, the emphasis is always on implementing content-centred practices, this could be because of the natural human tendency to concentrate on content. Or alternatively because; (i) it takes too long to figure out the nature of the learners; (ii) it takes time to get accustomed to content
before being able to achieve learner-centred practices.; (iii) it could that there is a natural theoretical move from concentrating on content to concentrating on the learner himself as the first beneficiary stakeholder.

Recently, there has been a growing emphasis on implementing learner-centred practices within e-learning environments. These practices focus on supporting learners in constructing their own understandings through complex learning experiences that emphasise interpersonal reasoning and social interaction (Duffy, 2004: p. 321).

The responsibility for determining whether it is going to be a content-centred or learner-centred practice lies with the instructional design that the educational institution in question chooses to adopt. One could argue that choosing the appropriate instructional design for: the learners’ learning style; the educational institution’s budget; and the teachers’ abilities is more important than providing the most advanced technologies.

Instructional design at the basic level can be tracked back to a number of learning theories; some of which appear in the works of behaviourists like Skinner and Thorndike because they were in the lead with the early efforts that eventually led to the idea of instructional design. Instructional design consists of several related theories and concepts that are rooted in learning theories (Paulsson, 2007).

The instructional design movement continued to evolve during the latter half of the 20th century and it has made a deep impression on “Technology Enhanced Learning” history with ideas such as the Teaching Machine, first introduced by Skinner, later re-launched by Gagné (Reigeluth, 1999). The appearance of the teaching machine accompanied the rise of “programmed instruction” as a new concept.

Later on, during the sixties, seventies, and eighties, programmed learning evolved into computer-based training and computer-based learning, and during the seventies learning theory and pedagogical practice started to move from behaviourist theories to cognitivist learning theories (Reigeluth, 1999).

It is important to differentiate between the terms involved in the criteria of instructional design. They are “Instructional design theory”, which deals with the methods of instruction and “instructional strategies”, which represent the practice of applying the theory to instructional development or instructional development processes (Reigeluth, 1999).

Some researchers may prefer to change the term from “Instructional Design” to “learning Design” such as (Sims, 2001) who advocated that the term learning design is used instead of instructional design to emphasise the learner-centred environments online resources can provide.
Interface Design:

E-learning interface design is a crucial matter to address in order to accomplish quality in an e-learning system. “E-learning interface design is especially critical, as the learning effectiveness and interface design are substantially intertwined” (Guralinick, 2009: p. 1).

“Effective User Interface design also incorporates elements of professionalism and sophistication. The user interface design is accessible, while still supporting the academic level of the material and the maturity of the learner. The learner is never presented with distracting animated graphics or navigational elements” (Wischmeyer, 2004: p. 2).

In the world of e-learning interface design, one can observe an argument between two kinds of designers: the first type try to make sure that the e-learning system is easy to use "usable" as the first priority in designing e-learning systems; while the other type think that it is the form by which people learn and the tasks that they need to perform in the system which determine the best interface design for the e-learning system (Guralinick, 2009).

From my point of view, the successful user interface design must have the advantages of ease of use, “usability” and a suitable instructional structure that considers learners’ needs and the tasks they have to perform. One cannot ignore the importance of usability in e-learning systems; you can see thousands of well-structured e-learning systems and no one uses them just because they are difficult to use and learners cannot find their way through them. Thus it is important for both points to be addressed if quality is to be accomplished in e-learning systems.

User Interface Design (Salmi) employs principles of instructional design, graphic design, and information management design. The main goal of effective UID is to create an environment for the user to successfully navigate and understand the material of the e-learning course. “The quality of the User Interface directly influences how the learner will interact with and process the information presented” (Wischmeyer, 2004: p. 1).

E-learning interface design should be determined by how learners learn, the knowledge they need to acquire via the e-learning course and to what extent it is easy to use.

Standards of user interface design:

Wischmeyer (2004) presented specific points to generate an effective user interface:
The content is presented clearly, in manageable “chunks” of information; The learner is engaged with interactivity and a system of navigation that provides a plethora of information and support; The system provides full email and telephone technical support for all its’ online learners; Users can interact with the course with both their
computer mouse and computer keyboard; The learner is presented with Hyperlinks to additional resources; A new browser window is opened so the user never loses their place within the lesson (Wischmeyer, 2004). These points represent a good list to use with which ensure quality in UID, although, one could argue that the last item in Wischmeyer’s list may be wrong because a tool bar could easily be included in the interface to make browsing even easier for learners. Whereas Guralinick’s (2009: p. 6) stated that the elements which should be considered when designing a quality interface are: A tutoring component is always available to the learner; The screen layout should draw the learner’s eye to the right things; The interface actions support the tasks the learner needs to perform; Learners do not need to click the mouse more than twice to complete an action.

Guralinick (2009) differentiated between two participants in designing user interfaces: “the design architect”, who is responsible for the learner’s experience; and the other is “the graphic artist”, who is just responsible for completing the artwork as directed by the architect.

In order to create a quality controlled e-learning system, an efficient user interface must be designed, thus it is crucial for the e-learning system designer to attain his/her own perspective regarding the system s/he is trying to build with a full understanding of the role and advantages of e-learning and with full recognition of the standards which guide the design of an e-learning user interface.

**Quality in e-learning systems:**

It is the dream of every educator alive; many researchers have talked about it: What does it mean? What is the best way to achieve it? How can it be guaranteed? How can it be reached theoretically and practically? How can it be continuous and durable? It is the dream of accomplishing quality in learning in general and specifically in e-learning.

The word quality has many meanings, as defined by Hoyle (2006: p. 8) these include:

- A degree of excellence.
- Conformance with requirements.
- The totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs.
- Fitness for use.
- Fitness for purpose.
- Freedom from defects imperfections or contamination.
- Delighting customers.
The most significant meaning which arises from the previous definitions of quality is that it is the process of searching for customer satisfaction regarding fulfillment of needs. Achieving quality in learning in general and specifically in e-learning systems requires deep attention and extra care regarding all the factors involved in the design and implementation of the e-learning system.

Quality is a result produced when a need, expectation, requirement or demand is met or satisfied (Berry, 2002: p. 22). Thus quality in e-learning systems is accomplished when the needs, hopes, expectations of all the elements involved in the e-learning systems are satisfied.

Many researchers have tried to investigate how quality could be accomplished through creating a group of benchmarks to guarantee quality in e-learning systems. In regard to the attempts that have been made to create benchmarks that lead to the designing and implementing of e-learning systems, one can identify groups with significant contributions, such as:

1. The American Institute for Higher Education Policy reported on '24 benchmarks considered essential to ensuring excellence in Internet based distance learning' (Institute of Higher Education Policy, 2000). These were arrived at after a review of the literature and carrying out research with institutions delivering distance learning to determine which benchmarks were in use. The benchmarks are divided into seven categories of quality measures, which are:
   - Institutional support
   - Course development
   - Teaching/learning process
   - Course structure
   - Student support
   - Faculty support
   - Evaluation and assessment.

   This is a manageable set of criteria with which to evaluate the quality of a course but it is incomplete and does not provide enough direction, especially in the areas of course design, content and production.

2. A consumer guide based on extensive research into the literature related to technology assisted (distance) learning. The quality of education and training is defined by what makes distance learning modules effective and efficient from a consumer's perspective. The criteria are presented as a serious of 15 questions, the scope of which is illustrated below:
Acquired content skills and knowledge should be; relevant, transferable, specific, etc.;

Necessary learning skills are acquired for; course completion, lifelong learning, self-directed learning;

Completion takes the form of credit or credentials that are; recognised by professional accreditation bodies and other educational institutions, equivalent whether learnt on-site or at a distance, transferable...;

Return on investment of the learner’s time, finances and energy meets expectations for; accessibility, objective benefits, effectiveness, efficiency, and customer satisfaction. (Barker, 1999)

As consumer guidelines these provide a good starting point for potential learners to assess if a course is likely to provide what they are looking for. However, the consumer focus leads to the guidelines being insufficiently output based, and they do not offer sufficient in-depth detail for a complete evaluation.

These guidelines for accomplishing quality in e-learning systems were quite good as initiative experiences. However, they are not comprehensive enough because either they were insufficient or they gave an incomplete picture of the evaluation process of quality in e-learning systems. Thus the researcher focused on designing a model to gather together all the possible factors that are involved in designing, implementing, and evaluating quality in e-learning systems.

Developing an E-learning Quality Model for HE:

This research idea began as a plan to build an e-learning system for Egyptian Higher Education but has turned into a model for constructing and, importantly, evaluating quality in e-learning systems. It will discuss: learning outcomes; stakeholders' satisfaction; learning environment; and evaluation during development.

With regard to establishing the quality of e-learning criteria, one can identify three categories of researchers. The first is those researchers interested in the learning situation provided by the e-learning system, such as Raab (2002) who identified e-learning as “a learning situation where instructors and learners are separated by distance, time, or both”. The second category consists of those researchers who are interested in the technological side of e-learning systems, such as Sun et al (2008) who identified e-learning as “the use of telecommunication technology to deliver information for education and training”. Whilst the third group look at e-learning from the perspective of relating the above two considerations, such as Rosenberg (2001) who identified e-learning as “the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance”. One can notice this equality between technology and the pedagogic when he stated that, e-learning is using
technology to create an array of solutions and that these two parts have to work together in order to succeed.

This categorisation agrees with what Smulders (2003) stated that a great proportion of the online discussion within e-learning environment was focused on troubleshooting the technical failings and logistical flaws of the course, with very little discussion about the actual course content. Does current e-education benefit from the convenience of the e-learning environment? Are the learners learning something through e-learning courses?

The researcher accepts the three perspectives on e-learning. The developer has to be aware of the available technologies to create an e-learning system as well as considering the pedagogical devices used within the e-learning system to best benefit from the e-learning affordances in achieving his/her goals from the e-learning system.

The most important issue, which should not be forgotten, is trying to achieve a balance between the technological and the pedagogical parts when designing an e-learning system. This is a warning not to be so attracted by the new technologies that one forgets all about good pedagogically designed e-learning systems. Otherwise, “both educators and learners may be too overwhelmed with this new technology and the countless potentials and possibilities that come with it, to an extent that these conveniences and innovations may be at the expense of jeopardizing the issue of pedagogy” (Chang, 2008: p. 40).

Bates (1997) believes there are four reasons for using technology in higher education: improving the quality of learning; improving access to education and training; reducing the costs of education; and improving the cost-effectiveness of education.

As a proof of the necessity of implementing quality in e-learning systems Sims (2001: p. 2) stated “it is critical that online development projects implement levels of quality control to ensure the learners receive the most effective resources.”

E-learning as a new method to deliver the curriculum is a very powerful and rich method with many affordances, opportunities, and outcomes. However it is like any other instrument of teaching, if it did not satisfy the users it will fade away and vanish. The quality itself, as this research defines; it is a mixture of satisfaction: stakeholders’ satisfaction with the e-learning system; authorities’ satisfaction with e-learning outcomes; community’s satisfaction with regard to the sociological impact of the e-learning on learners; the working market’s satisfaction with regard to the ability of the learners who have graduated from e-learning systems.

Planning for the implementation of quality and sustainable e-learning systems requires a suitable model in order to identify critical success factors that have to be addressed in an e-learning strategy. E-learning design models are attempts to develop
frameworks to address the concerns of the learner and the challenges presented by the technology so that e-learning can take place effectively. Therefore, researchers need to identify the models available for designing e-learning systems in order to fully benefit from the advantages of using such systems. Unfortunately, they are not readily available. “There is no patent remedy and no universally applicable, standard perspective for developing or assuring quality” (Ehlers, 2004)

This e-learning quality model which the researcher identified is designed to address the needs of higher education learners. Zhao (2003: p. 2) defined online higher education as “teaching and learning through electronic mail, the Internet, the World Wide Web (WWW), and multimedia in the higher education sector”. Because of the challenges that higher education institutions have faced recently and the rapid changes in learning environments universities have found e-learning systems suitable method to deliver their teaching. As proof, research from independent research companies showed that the corporate education market spent 16% in the year 2000 on e-learning initiatives and 24% in year 2001 with an expected rise in the years to follow (Bielawski, 2005).

Since the beginning of the 20th century, universities have been confronted with numerous changes in their environments. They are forced to respond to emerging challenges such as: broadening of the student body’s social profile, expanding and changing curriculum subject areas and the tensions between research and teaching endeavours. More recently, Alexander (2001) noted the rapid developments in information and communication technology (ICT); a shift in learners' expectations; changing demographics of learners; rapid development of subject knowledge and decreasing financial support.

All of these challenges have forced universities to look for a new method to deliver their curriculum, this is “e-learning” which Wagner (2006) identified as “the expression broadly used to describe instructional content or learning experience delivered or enabled by electronic technologies”.

Universities do not use e-learning systems simply because of the challenges they face but also because of the benefits they gain from using e-learning as a method of delivery including: Providing learners with the flexibility of learning at the time, place, and pace they choose (Institute of Higher Education Policy, 2000); Offering the opportunity to increase both the quantity and quality of interaction substantially.

As a result of the need for a revolutionary method to deliver the curriculum, e-learning has become a national concern, it has become the subject of a variety of government sponsored strategic initiatives in support of programmes for increasing participation in higher education and promoting e-learning as an approach to improve the quality of education provision and empowering learners (Britain, 2004).
Many researchers agree that interactive instructional design is an essential factor for learning satisfaction and success, Hong (2002) therefore, as noted by Inglis (1999) offers the opportunity to improve the quality of the learning experience.

The most significant advantage of e-learning, which determines the quality of an e-learning system is its ability to host one learner as well as hosting millions of learners; this is called Scalability - it is the ability of a delivery mechanism to cope with large numbers on-demand, at little incremental cost (Epic Group plc, 2003). It is the ability to host from 10 participants to 100 or even 100,000 participants with little extra effort or incremental cost (providing the infrastructure is in place). Rosenberg (2001: p. 31).

One of the most important benefits of an e-learning system is its ability to overcome boundaries of time, place, and nationality. It can provide teaching with a true sense of internationalisation. E-learning systems can be taught in two or more countries at the same time with the same quality.

Moreover, the e-learning system could be used to accommodate or compensate for the differences between cultures and used as a tool to fill the gap between countries around the world. E-learning is web-enabled and takes advantage of universal Internet protocols and browsers, which means that everyone on the web (the world) can be enabled to receive virtually the same material in the same way at the same time.

Many reasons influence educational institutions’ decisions to adapt e-learning systems as tools to accomplish internationalisation in many respects, such as:

- Increase student and faculty international knowledge capacity and production by (22%)
- Strengthen research and knowledge capacity and production (21%)
- Create international profile and reputation by (18%)
- Contribute to academic quality by (14%)
- Broaden and diversify source of faculty and learners
- Promote curriculum development and innovation by (8%) (IAU, 2006)

These institutions are also encouraged by the benefits earlier institutions gained from internationalisation, including:

- More internationally oriented learners and staff;
- Improved academic quality;
- Increased revenue generation;
- Greater international understanding and solidarity;
- Innovations in curriculum, teaching and research;
Foster ‘national and international’ citizenship. (IAU, 2006)

Learning is 24/7, people can access e-learning anywhere and at any time. (Rosenberg, 2001)

Even though educational institutions benefited from using e-learning, they should be wary of adopting e-learning as a delivery method for their curriculum unless they are certain they could benefit from its advantages as well as overcome its challenges. Many institutions have adapted e-learning systems to use as their curriculum carrier but they were confronted with the common problems that online learners suffer from such as:

- Technical problems;
- Lack of instructional familiarity associated with face-to-face conventional delivery systems in traditional classrooms;
- Lack of interactivity and limited interaction with the instructor;
- Delays in receiving feedback;
- Instructors’ inability to monitor learners’ cues (both verbal and non-verbal) in distance education, researchers are finding that learners have lower expectations concerning nonverbal behaviour than in the traditional classroom (Arbaugh, 2001);
- Lack of compatibility of online instruction with individual learning styles (Fabianic, 2002: p. 173);
- Taking one approach in terms of application of information technologies without sufficient regard for appropriate learning design.

These challenges have brought up many worries and threats to universities which include e-learning in their strategic planning process, these challenges have forced universities to analyse the current higher education market. Engelbrecht (2003: p. 40) stated a framework for identifying and organising threats to the traditional university education market. These threats are:

- First threat: the competition between educational institutions drives investment in e-learning. Traditional universities are now striving to offer e-learning environments which could offer convenient, flexible, on demand, affordable learning experiences to their learners (Bates, 1997; Engelbrecht, 2003).
- Second threat: The power of learners’ needs and demands. They need flexible learning environments to suit their dynamic careers and lives. The affordances of e-learning environments provide learners with the option to enrol at any university worldwide. In-house training or the so-called "corporate universities" or private educational institutions offer accredited e-learning programmes to
learners who do not meet the requirements of universities and are therefore excluded (Engelbrecht, 2003). It all comes back to the instructional design that the university adopts, whether it is learner-centred approach or content-centred approach. However, recently everything relied on the desires of the learners because they were supposed to be the main beneficiaries of e-learning.

- Third threat: The power of suppliers. Universities’ investments in e-learning come as a result of hoping to serve more learners with less expense. Many universities have formed partnerships with other universities or consortiums in order to serve more learners with a lower outlay of resources. Universities also form partnerships with private companies whose primary business is not education, but rather technology, software, content or any other resource provision (Engelbrecht, 2003). Over time those suppliers will have the power to interfere with the universities’ policies, practices and activities. This could be a serious threat to universities in the near future.

- Fourth threat: The risk of new competition entering the industry. The e-learning market is a complex of technology companies offering e-learning platforms, content providers offering learning materials, and service providers offering technical support. Some companies offer an integrated e-learning service. A company such as eDegree is an example of a university-to-employer intermediary. E-learning companies of this kind form links between universities and corporations. Universities have to view collaboration with the business sector as a new market for growth (Engelbrecht, 2003).

- Fifth threat: The threat of substitutes. This threat relates to the above threat. The new buzz word for in-house training by companies is “corporate university”. The corporate universities offer courses not only to their own employees but also to their suppliers and customers and in so doing attract revenue. The best example of a corporate university is Educate.com (Dell Learning), offered by Dell Computer Corporation (http://www.learndell.com/dell/)(Engelbrecht, 2003; Rosenberg, 2001: p. 203)

Implementation considerations
This research looks to design a high quality approach which can take the best of the e-learning benefits and try to overcome the common challenges of using e-learning systems.

In order to attain such quality in an e-learning system the researcher has used “VLE” which is a software system designed to support teaching and learning in an educational setting. The VLE system is integrated within itself so that learners can register themselves for courses in the Virtual Learning Environment. Once the learner
is enrolled in one or more courses, these courses have to be organised in a well-planned sequence so that there is no repetition or overloading at any point in time.

The VLE software used is open source software that enables the researcher to design the VLE according to their aims and objectives without any shortage in the affordances that any VLE software could offer. This free software is called Moodle.

Gillespie et al. (2007) identified VLE as “an application that enables teachers and learners to do some or all of the following:

- Share files;
- Download information;
- Email;
- Use discussion boards;
- Undertake tests and surveys;
- Share information;
- Organise time and resources;
- Link teaching and learning applications and activities with management education systems.”

While, Shrestha (2007) identifies the point VLEs have many affordances such as:

- Mapping of the curriculum into elements (or ‘chunks’) that can be assessed and recorded;
- Tracking of student activity and achievement against these elements;
- Support for online learning, including access to learning resources, assessment and guidance;
- Online tutor support;
- Peer group support;
- General communications, through a variety of media;
- Links to other systems, both in-house and externally.

These opportunities to engage with learners and for learners to engage with the curriculum offer the VLE approach to adapt to learners with different learning styles; Adey (1999: p. 2) states style is understood as “the way an individual sets about learning something”. Thus by effectively using this ability to adapt to a different learning style the learners’ satisfaction will increase, which will in turn reflect on increasing the quality of the VLE.
The term “quality” has different dimensions. Ehlers (2004: p. 3) defines quality in three ways:

- Different meanings of quality;
- Different quality perspectives; and
- Different levels of the educational process to which quality can apply.

Within a lot of quality e-learning models, many researchers believe that educational outcomes, rather than mode of delivery, should be the criterion for evaluating the quality of educational programs which can be obtained only by the satisfaction of all the elements involved with that program including the satisfaction with educational outcomes. “Providing the best possible forms of online learning is a critical component of the quality assurance process” (Oliver, 2001).

In order to obtain a model that can help in design and evaluating quality in e-learning systems, an important question has to be asked: What are the criteria for evaluating the quality of e-learning systems for higher education?

A study undertaken in Deakin University in Australia by Smissen (2002), gave details about the most important criteria used by academics to evaluate the quality of online teaching and learning systems, these criteria were identified as follows:

- Easy to use (user friendly interface and navigation)
- Extent of platform and browser compatibility (the availability for the users to access the system from different platforms and using different browsers);
- Extent of ease of creation and maintenance of course materials;
- Extent of synchronous (such as chat, sharing files, audio video communications) and asynchronous (such as e-mail) communications;
- Extent of online help;
- The ability to conduct online assessment including self-assessment and surveys;
- The ability to maximise collaborative work by allowing uploading, downloading, sharing files, and creating groups;
- Extent of customisation (allowing users to design their courses according to their own teaching styles);
- The flexibility of report generating;
- Ability to develop a database (creating interactive web pages).
The above mentioned quality criteria have focused upon the technological part of e-learning systems disregarding some very important aspects of the design and evaluation of a quality e-learning system, such as those raised by Arbaugh (2001) and Ehlers (2004):

- The pedagogical part in designing a quality e-learning system;
- The interaction between the instructor and his/her learners and between the learners themselves;
- The quality of the taught materials and resources; and
- Course structure and design. (Arbaugh, 2001; Ehlers, 2004)

These criteria have implications for the whole matrix of designing, implementing, and evaluating the quality in e-learning system in relation to all the elements that influence the quality of e-learning systems.

In order to capture the multidimensional nature of an online professional quality system, designers and evaluators must follow guidelines from numerous conceptual frameworks to design a plan that will collect vital information about whether or not system objectives were met and whether best practices were implemented. As a reflection of this challenge and as a response to all the needs mentioned above, the researcher proposes a model for designing and evaluating quality in e-learning systems incorporating: (1) Stakeholders’ Satisfaction; (2) Learning outcomes; (3) Learning Environment; (4) Evaluation during Development.

The proposed model for quality e-learning implementation acknowledges the motivations arising from the challenges: improving the quality of learning, improving access to teaching and reducing the costs for providers. Consequently the model facilitates:

- flexibility of learning at the time, place, and pace learners choose;
- increased quantity and quality of interaction of learners and tutor;
- scalability of deployment and reducing the costs of education;
- increasing accessibility; and
- reducing aspects of technophobia;

An important criterion for designing and evaluating quality in e-learning systems is the continuing assessment of the learning environment before, during, and after the implementation. This evaluation will be guided by a group of critical success factors for the implementation and evaluation of quality in e-learning systems.
Quality E-learning Model.

Stakeholders' Satisfaction:
When determining the success of online learning, satisfaction may need special attention (Y. S. Wang, 2003). In ordinary e-learning it is only important to measure the satisfaction of the users (learners). However, in professional quality e-learning systems it is crucial to measure the satisfaction of all of the elements involved in the design and implementation of an e-learning system.

Many of the e-learning researchers identify learners as the principal stakeholders in e-learning systems, while others consider learners to be the main consumers of e-learning systems. Recently, Giese and Gote (2000: p. 2) proposed a definitional framework for consumer satisfaction. They identified the similarities between (20) different definitions used in the past 30 years of consumer satisfaction research. Consumer satisfaction appears to consist of three essential components: (1) summary affective response, which varies in intensity; (2) time of determination, which varies by situation but is generally limited in duration; and (3) satisfaction focused around product choice, purchase, and consumption. As a result of this, Wang (2003: p. 77) defined e-learner satisfaction as "a summary affective response of varying intensity that follows asynchronous e-learning activities, and is stimulated by several focal
aspects, such as content, user interface, learning community, customization, and learning performance.”

As apparent from the last paragraphs, the concentration was on learners as the main stakeholders in e-learning systems. However, in the world of e-learning quality assurance it is essential to guarantee the satisfaction of all the stakeholders involved in the learning environment and not just the learners.

Next, the researcher will try to identify all the stakeholders involved in designing and implementing quality in e-learning systems.

**Students**

Whether e-learning courses are blended e-learning (where the learning process is a mixture of online learning and ordinary face-to-face learning) or the entire courses are online, modern higher education students should be encouraged to use e-learning systems. Researchers, Allen (2002), Wilkes (1991) have shown that students’ satisfaction plays a very important role in encouraging students to participate in e-learning courses. An important question is how student satisfaction in e-learning systems can be increased, and this becomes more urgent, from many aspects, as the world moves from the “early adapter” stage to the “wide spread usage” stage. There is a strong argument that the best strategy for e-learning is for it to be based on the learners, thus the needs of the learners have to be determined in a concrete manner before designing an e-learning system. Research by Wagner (2006) has also linked higher levels of interactivity with increased student satisfaction in e-learning. Students’ satisfaction concerns satisfaction with the quality of the course, the interaction with both their instructor and their colleagues, and with the support they find during learning via the e-learning system.

A number of research studies compared students’ satisfaction with face-to-face (FTF) delivery method versus e-learning (under different terms) (Akdemir, 2008; Cook, 2008; Frydenberg, 2007; Jahng, 2007; Summers, 2005). The majority of this research has concluded that students are as satisfied with their distance learning experience as they are with their face-to-face experiences. While many of research studies compared e-learning students’ satisfaction with FTF students’ satisfaction (Buzzetto-more, 2008; Young, 2002) and they concluded that students are more satisfied with their e-learning experience than with their experience of ordinary FTF learning. This could be an indication that an argument exists over the criteria for judging learners’ experience with e-learning systems. However, from the researcher’s point of view, e-learning could have a major effect on learners if designers could fulfil their needs and provide them with a satisfying e-learning experience, which would reinforce the researcher’s definition of quality in e-learning as a mixture of types of satisfaction.
The strongest preferences noted in the previous studies were towards the online submission of assignments; the availability of online lecture notes; discussion section; availability of web links; and inclusion of calendar entries. Online exams were viewed as convenient and the receipt of an instant grade and feedback after taking exams was found to be favourable. Additionally they liked having the ability to check assignment grades online.

**Instructors:**

Learners have preferences towards communication and co-operation with the tutors of online course which could be an indicator of the importance of tutors interacting with learners. Ehlers’s study (2004) showed that tutor support is very important for learners in general, that 97.7% of learners value tutor support as an “important” or “very important” aspect. Thus, it is important for instructors to have motivation and satisfaction in the e-learning system s/he uses. Instructors can be encouraged to use e-learning systems: by their institution’s policy or provision; their professional or personal wish to reach as many learners as possible; or their personal interest in uses of modern technology in the field of education. In recent times, the instructor’s role has changed from being a source of the knowledge into a manager or a director towards the source of knowledge. The important question still remains, how do instructors participate in ensuring an e-learning system is of high quality and also an enjoyable and useful e-learning system? In order to increase usefulness and enjoyment in an e-learning system instructors should “vary the types of content, create fun activities, provide immediate feedback, and encourage interaction” (Lee, 2005; Wagner, 2006)

**Accreditors:**

The more e-learning applications expand, the more important it is for accreditation bodies to ensure that they encompass e-learning in their own standards. In today’s world it is important for e-learning courses to be taken seriously and in order to be so; a proper accreditation process for the courses must be established.

This accreditation process has to be designed according to a group of quality benchmarks, which determine the presence or the absence of quality in an e-learning system.

**Content designer:**

Content designers should be motivated to use e-learning systems when delivering their courses; this motivation could be rewarded by an increase in positive learning results or via the copyright/licensing arising from selling the products to multiple customers.
The content provider’s responsibility is to prepare the course in a format that allows the content to be supported by different e-learning technologies. It is very important for the content designer to have reasonable computer literacy to enable him/her to judge the possibility of transforming the content into an e-learning context.

System Designer:

E-learning system designers are also motivated to provide users with an effective e-learning system but their contribution is evaluated so s/he needs to develop his/her system continually in order to obtain the satisfaction of all the other stakeholders within his/her e-learning system. It is very important that system designers should be educational instructors as well, in order to understand the different learning styles and to have the ability to cope with each type in his/her design. Thus, it is very difficult to be a successful e-learning designer because you have to provide a system that accommodates personalisation of the learning process and copes with the differing characteristics and learning styles of the learners.

Educational Institutions:

Higher Education institutions are highly motivated to adopt e-learning systems because of the advantages they offer in the learning process. Their increased use of e-learning systems was encouraged in the Government's 2005 strategy paper, “Harnessing technology - transforming learning and children’s services” (DfES, 2005). Converting to an e-learning method of delivery has a lot of benefits for higher education institutions, for example the ability to reach a lot of learners in different places around the world and at different times breaking the shackles of time and place and removing overheads such as accommodation and services. The institutions must be satisfied with the e-learning system’s design from both technological and pedagogical perspectives in order to accomplish their aims.

Learning Outcomes:

Although all the benefits to stakeholders of e-learning systems have been identified, there is an important question still to be asked, how is the effectiveness of e-learning assessed? From an economic perspective, educational institutions will look for a return on their investment in e-learning systems, on other hand, it is important to also consider effectiveness in terms of learning outcomes.

The National Foundation for Educational Research (NFER) undertook a survey of all further education and sixth form colleges and indicated that e-learning had impacted on learners’ experiences of learning across a range of contexts. Around half or more of the lecturers felt that e-learning had helped their learners to research and present their work more effectively and to be more effective in reinforcing their knowledge,
developing their understanding and engaging with the subject in the classroom (Golden, 2006: p. 39).

**Usability of knowledge and skills:**

The term “usability” is used in the field of e-learning to address two areas:

- The first refers to the ease of use for the e-learning interface, which relates to the human-computer interaction (HCI) and pedagogical aspect in e-learning systems. The International Standards Organisation (ISO) defines usability as “The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context” (Ssemugabi & Villiers, 2007: p. 132). Guralinick (2009: p. 1) stated “a trend toward ensuring “usability” particularly among large corporations in the U.S., has led to a “usability-first” way of thinking about e-learning design, in which ease of use is considered to be the top design priority.”

- The second refers to the extent to which learners use the knowledge gained from the e-learning system in their future lives. The situation today is not only characterised by the importance of knowledge and information, but the acquisition and application of knowledge. The importance of learning (in general) is determined by how much knowledge is gained and can be used. In other words, the usability of what is learned determines the quality of learning; usability and increased capability is also a measure of e-learning.

**Improvement in learning outcome:**

UCE Birmingham (1984) identifies learning outcomes as: “the specific intentions of a programme or module, written in specific terms. They describe what a student should know, understand, or be able to do at the end of that programme or module.” Thus, it is very important to know the exact outcomes required by the e-learning system before the design process begins. In order for an e-learning system to be a quality system it must show that, through its use, a measurable and noticeable enhancement in one or all of the learning outcomes (knowledge, skills, understanding, and attitudes) is accomplished.

**Learning Environment:**

**Web 2 Activities: (collaboration activities)**

The collaboration sequences in online courses focus on social interaction through online discussion, group activities, web logs, WIKI and computer mediated communication in general.
Personalised learning:

One of the current issues in the e-learning field is how to communicate with each student as if s/he is the only student learning within the e-learning system. This can be equated with coping with the learning style of each student. Thus, one of the ways to evaluate the quality of an e-learning system is to evaluate its tools for coping with different learning styles.

E-learning facilities to access and interact:

An aspect of evaluation of the quality of e-learning systems relates to accessibility for learners and the opportunities the system offers for users to interact with each other and to interact with the instructors. These considerations have a technological aspect regarding accessibility and a pedagogical aspect relating to the kinds of interaction available for the users of the system.

Evaluation during development:

E-learning Quality:

From reviewing the literature, personal experience, and the stakeholders’ response to questions, the researcher will propose a group of critical success factors (CSF) for the successful implementation of e-learning inside the Egyptian higher education sector.

E-learning Standards:

The researcher could argue that through following the known standards of designing e-learning, quality (at least in the interface criteria) can be guaranteed.
Chapter 3 ‘Research Design’

“Good social research is a matter of “horses for courses” where approaches are selected because they are appropriate for specific aspects of investigation and specific kinds of problems.”

(Denscombe, 1998: p. 3)

Introduction

This chapter describes the research design, including the rationale used to inform that design, and the methods considered and adopted to enable the collection of data. It begins by examining the philosophical research assumptions underlying the research. Then it goes on to consider the case study as the approach to follow. It also discusses the use of quantitative and qualitative research methodologies and finally concludes by highlighting the important issues regarding the case selection, the data gathering, and analysis process.

Research design

This research is interested in accomplishing quality in e-learning systems which requires a continuous operation of assessment and evaluation of the values of the e-learning system. This research is not a follower of “the findings end the research” method because it goes beyond the findings phase into a continuous process of searching for the quality in e-learning systems.

This research is trying to set a parameter for designing and evaluating e-learning systems with special concentration on the Egyptian higher education context. The researcher aims for this research to become a tool capable of guiding researchers in the criteria of e-learning, to the important issues to be considered in designing and evaluating quality in e-learning systems. Thus the researcher is trying to conduct a beneficial piece of research worth respecting which doesn’t just contain a collection of data and its analysis, but tries to make the initial steps toward designing, implementing and evaluating quality in e-learning systems.

Many educators argue for a teacher researcher concept on the basis that traditional educational research has been inadequate in terms of helping classroom teachers to improve their practices. Consequently, teachers often regard educational research as something irrelevant to their lives and see little interaction between the world of educational research and the world of teaching. This research is an attempt to join the two worlds of theoretical and practical educational research, by combining the designing of a systematic approach (model) for designing and evaluating quality in e-learning systems, with the implementation of a suggested e-learning system.
(Computer-Maintenance e-learning system). So it is important to offer the opportunity for Egyptian higher education learners to become accustomed to using e-learning systems before getting their feedback on the research's data gathering tools, in order to combine the theory and the practice and ensure that the quality e-learning system model met the practical conditions and circumstances which a quality e-learning system would face in a real practical context.

The beauty of e-learning systems is that they use computer functionality to simulate the ordinary learning environment through making the whole process of learning virtual, in other words; all that the learners need, they will find between the virtual walls of the e-learning environment.

This research is focusing on the area of quality in e-learning and interested in the opportunities to find out an empirical evidence to refine the suggested model of quality in e-learning systems in addition to search for suitable measurement methods to clarify whether any e-learning system has a quality of learning according to the suggested model.

During the processes of this research an e-learning system was implemented to teach the computer-maintenance curriculum to fourth grade learners/computer-teacher division/ Instructional Technology Department-Tanta University, and then this suggested e-learning system was put under a real and hard test in the Egyptian Higher Education context in order to clarify the suitability, and efficacy of e-learning systems in the Egyptian Higher Education context, and to give the Egyptian learners an adequate experience with e-learning systems to get their feedback regarding to what extent the quality e-learning model will help in building and evaluating quality in e-learning systems.

**Research questions:**

1. What is the suggested model to guide design and evaluate quality in e-learning systems?
2. What is the efficacy of the suggested model in designing and evaluating quality in e-learning systems?
3. What is the efficacy of using e-learning in the Egyptian higher education context?
4. What is the effectiveness of the suggested e-learning approach on students’ achievement level in the computer-maintenance curriculum?
5. What is the effectiveness of the computer-maintenance e-learning system on learners' satisfaction toward e-learning as a delivery method?
Research Approach

In order to investigate the efficacy of e-learning systems to the Egyptian higher education and to define how quality could be accomplished in e-learning systems, this investigation covered multivariate study and used multiple methods to collect the data. Thus, using a case study approach is the most appropriate approach to follow because of the nature of the research questions and because the results are intended to be useful within the environment being studied.

Case Study Identification:
The Dictionary of Sociology states, “Case Study; The detailed examination of a single example of a class of phenomena, a case study cannot provide reliable information about the broader class, but it may be useful in the preliminary stages of an investigation since it provides hypotheses, which may be tested systematically with a larger number of cases” (Abercrombie, 1984: p. 34).

The previous definition of case study caused some quantitative researchers to argue that, if a case study is used to generate, but not to investigate the hypotheses, then it should be used as a stage in the research rather than the whole approach.

Qualitative researchers argue that rather than using large samples followed by examining a limited number of variables, the case study method involves an in-depth examination of a single instance or event. Researchers may gain an in-depth understanding of why an event happened as it did, and what it might be important to look at more extensively in future research.

Stake (1995: p. xi) identifies Case Study as, “The study of the particularity and complexity of a single case, coming to understand its activity within important circumstances.” While, Gillham (2004: p. 1) defines it as “an approach that tries to represent a case through the investigating of an individual or a group such as a family, class, or an office”.

Jaques (1994: pp. 75-114) lays out an interesting outline for describing what a case study should be and do:

- Written summaries or syntheses of real-life cases based upon data and research;
- Require you to isolate and think through the key issues involved against both theory and the larger comparative environment;
- Identify appropriate strategies for the resolution of the 'case';
- Weigh the pros and cons of the remedial options/strategies; and
- Recommend and present a rationale for the best resolution.
From these definitions case study could be considered as: case (the single example), and study (the in-depth analysis).

Thus it means “a research conducted to examine in-depth a specific element.”

**Why Case Study?**

One can find a lot of support for the case study’s methodological approach in educational research literature which represents powerful points to guide researchers to use the case study approach.

Yin (2003: p. xi) stated that “case study is appropriate when investigators either desire or are forced by circumstances to: (a) define research topics broadly and not narrowly; (b) cover contextual or complex multivariate conditions and not just isolated variables; and (c) rely on multiple and not singular sources of evidence.”

In order to investigate the efficacy of e-learning systems to the Egyptian higher education sector and to define how quality could be accomplished in e-learning systems, this investigation covered multivariate study and used multiple methods to collect the data, which could indicate the quality criteria that should be included in the designed model for quality in e-learning systems.

The case study offers a means to investigate complex social events consisting of multiple variables of potential importance in understanding the phenomenon. In order to achieve this, case study allow researchers to use various data collection tools, it even allows them to use a variety of methods underneath the umbrella of a case study approach.

This methodology is the best way to determine (a) what the factors that determine quality in the e-learning systems are; (b) what is the efficacy of e-learning systems if they are used in the Egyptian higher education context; and, (c) what is the efficacy of the suggested model in designing and evaluating the quality of e-learning systems.

Yin (2003: p. 4) stated “The case study method is the method of choice when the phenomenon under study is not readily distinguishable from its context”.

This research is trying to study the effects of implementing an e-learning system in the Egyptian higher education context and broadly focuses on studying every element involved in the process of implementation and covers the complex multivariate conditions of the whole process relying on multiple data collection tools which shape the sources of evidence this research needs.

“An example of the complex interactions between the phenomenon and its context is the implementation of personal computers in schools (Yin, 2003: p. 4)”. Which is similar to what this research is doing by studying the implementation of an e-learning
system in the Egyptian higher education context, trying to study all the elements involved in the implementation of such a system?

Stake (1995) distinguished three types of case study which are defined by Helen Simons as:

- Intrinsic: where the case is studied for intrinsic interest in the case itself;
- Instrumental: where a case is chosen to explore an issue or research question determined on some other grounds, that is, the case is chosen to gain insight or understanding into something else;
- Collective: where several cases are studied to form a collective understanding of the issue or question (Simons, 2009).

This research belongs to the instrumental case study type because it explores the case of the Egyptian higher education’s usage of e-learning to gain insights into, and a better understanding of, the necessary criteria to be included in the suggested model for designing and evaluating quality in e-learning systems.

Hitchcock (1995) remarked that “case studies are often valued when the research attempts to provide practitioners with better or alternative ways of doing things.” This research is trying to investigate the efficacy of a model to design and evaluate quality in e-learning systems which are delivered to higher education learners.

Arguably, the most reliable reason for choosing the case study approach is: the richness of the data it gets and the ability to collect more in-depth data about the case in a natural context. Creswell (2007) pointed out “case study captures the complexity of case/cases through detailed, in-depth data collection.”

This study could have been designed as a survey or a secondary analysis of educational data, both of which are common ways of investigating this topic. However, such investigation does not permit in-depth examination of the factors involved with the implementation and evaluation of a quality e-learning system. In contrast, the instrumental case study is intended to examine the factors more closely, thereby requiring data collection from multiple sources and not from just one source.

**Conceptual Framework:**

The conceptual framework which guided the establishment and the evaluation of quality in e-learning systems and accordingly leaded the choice of the data collection methods is:
Stakeholders Satisfaction:
This research tries to investigate how quality could be accomplished in e-learning systems. Therefore, the quality assessment tools should consist of a matrix of tools to give the designer the chance to capture the minimum details, in order to assess the availability of quality in his/her e-learning system. In order to assess each Stakeholders Satisfaction the research needed the following tools to collect the data: questionnaire in order to get the attitudes of the available stakeholders toward e-learning systems and how quality could be implemented in them; focus group to enable the researcher to get the groups’ opinions regarding their experiences with the e-learning system and to give the researcher the ability to offer them to participate in an in-depth interview; and interviews to get the chance to meet each of the available stakeholders in order to collect in-depth details about the Implemented Computer-Maintenance VLE.

Learning Outcomes:
Learning outcomes have been categorised into Knowledge, Skills, Attitude, Understanding (as the possible outcomes) and the usability of knowledge and skills. In order to assess each element in the learning outcomes the research will need the following tools to collect the data: questionnaire to get the student’s opinions about their ability to use knowledge and skills they gained from the e-learning system and to assess the change in attitudes towards e-learning systems as a result of learning with
the VLE; and an achievement Tests: (Pre-Post) in order to know how far the learners went in gaining knowledge and information by using the e-learning system.

Environment Facilities:
In order to assess each element in the Environment Facilities the following tools to collect the data is used: Interviews to meet each of the available stakeholders in order to collect every little detail about the affordances of the implemented VLE.

Evaluation during Development:
This element is meant to be regarding the regular evaluation system from the perspective of standards and quality; in other words evaluate how far the designers of the system follow the regulations of known standards in building up their systems. In order to assess this element this research will conduct a group of critical success factors, which include all the relevant factors a successful VLE should have.

After viewing the conceptual framework, and because the main concern in this research is how quality could be accomplished in e-learning systems, the case study approach is used to examine the suggested conceptual framework in a real context; the Egyptian Higher Education context. Case study is used to closely observe and evaluate: the efficacy of the e-learning systems in the Egyptian Higher Education context; the efficacy of the suggested model in designing and evaluating quality in e-learning systems.

It is important to present a timetable to describe when, how, what happened during the application of data collection methods. (See table 2)
### Table 2: Chronology of the data collection

<table>
<thead>
<tr>
<th>Method</th>
<th>What Happened</th>
<th>Where</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>An achievement test to know the preliminary achievement level of the learners before involving in the learning processes.</td>
<td>VLE Application</td>
<td>Tuesday, 17 March 2009</td>
</tr>
<tr>
<td>Post-test</td>
<td>The same achievement test to measure the achievement level of the e-learners after learning with the implemented e-learning system.</td>
<td>VLE Application</td>
<td>Mon, 13 April 2009</td>
</tr>
<tr>
<td>Focus Groups</td>
<td>to get the groups’ opinions regarding their experiences with the e-learning system</td>
<td>Inside the buildings of the Faculty of Specific Education/ Tanta University (Educational Technology building – computer Lab. 1)</td>
<td>Mon, 6 April 2009 &amp; Wednesday, 8 April 2009</td>
</tr>
<tr>
<td>Interviews</td>
<td>to collect rich details about the efficacy of the Implemented VLE</td>
<td>Inside the buildings of the Faculty of Specific Education/ Tanta University (Educational Technology building – computer Lab. 1)</td>
<td>From 12 to 20 April 2009</td>
</tr>
<tr>
<td>VLE Feedback</td>
<td>The feedback on the e-learning system from the participated learners, which included “two” forum sessions and “one” chat session.</td>
<td>VLE Activities</td>
<td>From 17 March to 25 April 2009</td>
</tr>
</tbody>
</table>

### Quantitative versus qualitative methodologies for this research:

Gorard & Taylor (2004: p. 3) “outlined some important points about the methodological approaches to research:

- Qualitative or quantitative represents only one way of classifying methods;
• The choice of method is determined by the needs of the investigation not the personal preferences or fears of the investigator;

• All researchers need to be able to use a range of techniques.”

Over the last 20 years, there has undoubtedly been a move towards much greater use of qualitative approaches. This has become a general concern within UK social sciences, supported by the recent Commission on the social sciences (2003: p. 8), which described a deeply worrying lack of quantitative skills.

This could indicate that there is a problem regarding good quantitative researchers in the U.K. But whatever the causes and solutions for such problem, choosing the appropriate research method for research is totally dependent on the research question, and then it is the responsibility of the researcher to master that method in order to use it efficiently in his/her research. "The use of qualitative and quantitative methods is a choice, driven largely by the situation and the research questions, not the personality, skills, or ideology of the researcher." (Gorard, 2004: p. 2)

Connolly (2007: p. 4) stated that “qualitative methods are subjective and anecdotal or that quantitative methods are crude and simplistic and thus unable to capture the realities of social life. However, it is only when you step back from these arguments to consider them properly that you can see just how nonsensical they are. For example, it is equivalent to a builder arguing that hammers are better than screwdrivers. It just does not make any sense. The point is that both tools are useful but for different jobs. Imagine if the builder advertised his or her services but stated that whatever the job, he or she would only ever use a hammer. How many of you would invite them into your house to re-tile your bathroom? It may sound silly but how is this any different from someone in an educational research context claiming that they only do quantitative (or qualitative) research?”

It could be argued that a good researcher is not the one who takes good decisions rather the one who better deals with the decisions s/he takes. Thus it is important for researchers to learn how to deal with their choices because the research process is full of choices and decisions that need to be taken and more importantly the researcher needs to learn how to deal with the consequences of each choice.

Quantitative data may provide the basic answers for the research questions, while qualitative methods are used to make more detailed exploration and to provide further details. According to Borg and Gall (1989) The use of both qualitative and quantitative methods, is a legitimate approach to research, and may lead to a logical fulfilment of the research requirements.

Using both qualitative and quantitative methods for collecting the data was meant to empower the research findings. It has been suggested by Creswell (1994) that using
more than one approach gives the researcher the opportunity to better understand the issue being studied.

**Access & the Setting**

A case study approach is conducted in the area of the Egyptian higher education and to be more specific the population of the research are the learners of the fourth grade/computer-teacher division/ instructional technology department at the faculty of specific education/ Tanta University.

During the processes of this research an e-learning system was implemented to teach the computer-maintenance curriculum to the participated learners in order to clarify the suitability, and efficacy of e-learning systems in the Egyptian Higher Education context, and to give the Egyptian learners an adequate experience with e-learning systems to get their feedback regarding to what extent the quality e-learning model will help in building and evaluating quality in e-learning systems.

By reviewing the literature the researcher began with a long list of factors involved with implementing quality in e-learning systems, and from this long list the researcher determined a group of factors that actually influence the decision for designing and implementing quality in e-learning systems. Thus the researcher found that designing a quality e-learning model is the most appropriate way to congregate all the factors that influence designing and evaluating quality in e-learning systems.

By studying each factor in this model closely and figuring out the relationship between all the factors in the model, a lot of information and points with which to guide researchers about how to accomplish quality in e-learning systems are expected. As a result of the conceptual framework various data is collected and a variety of data collection methods are used, thus “Case Study” is an appropriate approach to use in this research. To provide a practical solution to the problems of designing and evaluating the quality of e-learning systems and to answer the research questions presented in this study completely and appropriately, a mix of quantitative and qualitative methods were used under the case study approach to investigate the efficacy of e-learning systems for the Egyptian higher education and to investigate the efficacy of the suggested model in designing and evaluating quality in e-learning systems. Denscombe (1998: p. 31) stated that “One of the most strengths of the case study approach is that it allows the researcher to use a variety of sources, a variety of types of data and a variety of research methods as part of the investigation.”

Stake (1995: p. xi) identifies case study as, “the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances.”
“Doing a good case study is more than just looking at what is happening in a few instances. It is a special systematic way of looking at what is happening, of selecting the instances, collecting the data, analysing the information, and reporting the results” (Shih, 2002: p. 25)

**Sampling**

The research sample are the learners who participated in the computer-maintenance course in which e-learning is used as a solely tool to deliver the curriculum.

The Faculty of Specific Education was established in 1988. The Faculty follows Tanta University and has a department named “Instructional Technology” established to educate special kinds of future teachers with the ability to cope with modern technology and use it to enhance the Egyptian education system.

This department is divided into two divisions: “computer-teacher” division that is responsible for graduating computer teachers. The learners taught a lot of computer science curriculum including the computer-maintenance curricula, and the other division the “General Division” is responsible for graduating technical specialists for the educational aids used in the Egyptian schools.

The learners’ experiences as future computer-teachers that have participated in designing many multi-media projects, some of them have already designed e-learning systems, and all of them participated in learning with the implemented VLE in this research and learned through other e-learning systems inside the Faculty of Specific Education- Tanta University is an important issue in getting their truthful feedback through the used data collection methods.

As a result of the large number of learners (approximately 100 per year) in the same grade; both learners and tutors face difficulties because there is no specific or precise definition for the curriculum taught; and there is a tendency to concentrate on the theoretical side of the curriculum disregarding the practical side of it. The researcher has conducted his Masters research to improve the curriculum of computer maintenance, but there were a lot of difficulties regarding the time, space and affordances facing the researcher while implementing this particular curriculum with a paper-based method. Thus this research is an attempt to search for the most appropriate method of delivery for the Egyptian higher education curriculum.

Many researchers have suggested that e-learning has proved its efficacy in improving the learning outcomes in diverse criteria (Bouhnik, 2006; Liaw, 2007; R. T. Raab, Ellis, W. W., and Abdon, B. R., 2002). This research will be conduct investigating the abilities of this method of delivery: “e-learning” to improve the learning and teaching of computer-maintenance curriculum and thereby prove its efficacy for applying in the context of Egyptian higher education.
There were over (165 enrolled) in the VLE over the semester, with (65 participants) completing the units of the computer-maintenance course including (eleven groups) of learners. Each group contained from three to six learners. All the groups studied online units.

In term of Generalisation, the faculty of specific education-Tanta University is one from 18 similar faculties all over Egypt. They follow the Ministry of High Education (who design and supervise all the plans and curriculum specifications for all the higher education institutions). Thus the researcher argued that if the designed quality e-learning system proves its efficacy to Tanta University learners, it will be the same at the other similar 18 faculties around Egypt. Cohen et al. (2007) pointed out that generalisation can take different forms such as when characteristics in a single case could seem to be similar to a variety of cases.

**Participants**

The involved participants in the data collection were “3” University lecturers (2 lecturers “men” + 1 “lady” professor) with good experiences of supervising, designing, and teaching e-learning systems in the Egyptian higher education context; “65” learners participated in the computer-maintenance e-learning course represent the whole population of the fourth grad learners (3 male learners + 62 female learners)/computer-teachers division at the faculty of specific education- Tanta University.

**The Implemented VLE**

In order to gain access to a certain sample, the research followed the following steps: The main instruction was conducted totally by the designed VLE; The designed VLE contained two kinds of activities: collaboration activities include online two-way communications between both instructor and learners, and learner to learners via the course website to enhance learning; and personalisation activities include learning activities dependant on the person’s efforts to improve his/her learning; The evaluation in this research is divided into two categories: the evaluation for the learners of their learning improvement in the computer-maintenance curriculum; and the evaluation of the quality e-learning system - according to the designed model - as a tool for delivery of the Egyptian higher education curriculum; Overall (2 units) of the computer-maintenance curriculum were taught over the semester and each unit was offered entirely online; In the VLE, all resources were mainly online and available on the Internet. The whole course was delivered via a VLE designed and supported by a software called “Moodle”; During the data collection period there were two face-to-face meetings with the learners (one before they start the course to explain the new method of delivery for them, and the other after they had finished learning with the VLE) to ascertain what difficulties they had faced during their learning and to arrange suitable
times to meet with the learners in order to collect their feedback regarding their experiences in learning with the VLE.

Recently, in Human-Computer Interaction (HCI) research the capturing of user experience has been an important and interesting research issue, and that is why empirical evaluation methods are used wildly in HCI research (Arhippainen, 2003).

Basically, user experience refers to the experiences that a person obtains when he/she interacts with a product under particular conditions, in order to get his/her reflective thoughts regarding these experiences. There are several methods in the user experience research area that have been used for capturing experiences, for instance interviews, observation, surveys, diaries, storytelling and prototyping (Arhippainen, 2003).

An extensive literature search was carried out in order to: design the quality e-learning model, develop a set of criteria for investigating the efficacy of e-learning for the Egyptian higher education, preparation of the semi-structured interview schedule and the focus group concentration topics, and design of the questionnaire (Mamary, 2000; Ofsted, 2009; Paulsson, 2007; Y. S. Wang, 2003; Washer, 2001; Wischmeyer, 2004).

A long search for the most appropriate software to use in designing and implementing the VLE was followed by designing the curriculum in the electronic format. The search for the appropriate quality electronic sources has taken a lot of time and research from the literature to find out the specifications of quality electronic sources (Mattheos, 2001).

In order to complete the process of evaluating the designed VLE; the researcher used two methods of evaluation:

- EEM (Experts Evaluation Method).
- Usability test for the VLE.

Usability tests and expert reviews are staple methods in the field of human-computer interaction (CUE-4, 2003).

Three of the researcher colleagues in the school of Education–University of Southampton tested the designed VLE to give their opinions, experiences, comments and questions regarding the VLE and its suitability for the desired objectives and to what extent its affordances are sufficiently exploited.

Usability tests: The insights gained from usability testing are essential for creating a truly user-centred website, software application or product. It allows the designer to look through the eyes of the user, identifying potential usability issues before release and allowing them to be corrected in a highly cost-effective manner (User Vision, 2009).
How it works? Based on task analysis, user profiling and the educational organisation objectives, the researcher created realistic task scenarios to test the VLE. Three of the researchers’ colleagues in Egypt helped the researcher to conduct the usability test, each colleague performed a series of tasks and ‘thinks aloud’ through synchronous chat online and to describe their steps to reach the task goal. The researcher observed and recorded the users’ actions, thoughts and opinions, and where necessary, asked questions to better understand the person’s strategy and experience (User Vision, 2009).

The Task Scenario:

- Opening the VLE link to test the access speed.
- Make an online registration.
- Enrol oneself in the desired course in the VLE.
- Investigate all the links in the chosen course to see if they are working, opening with suitable speed, and compatible with different browsers.
- Participate in all the activities in the chosen course to enable the designer to test the accessibility to all the previous activities data.
- Participate in the quizzes in order to estimate a suitable time to solve the quiz and to determine the best design of the quiz screen.

The Data Collection

Data collection phase lasted over one and half month and employed both quantitative and qualitative data collection methods, all the data collection phase was originally collected by the researcher.

The qualitative used methods were semi-structure interviews, focus groups, and the learners’ feedback on the implemented VLE, while the quantitative used methods were a questionnaire and a pre-post achievement test.

Qualitative Data was collected through “four” focus groups during which the researcher has tried to recognise the challenges which the participants found during studying via the e-learning system, and “five” one-on-one interviews (each lasting around 20 minutes) during which the researcher asked participants about their experiences with e-learning systems and how it could be implemented as a quality e-learning system.

The involved stakeholders in the data collection were “3” University lecturers with good experiences of designing and teaching e-learning systems to the Egyptian higher education learners; “65” learners participated in the computer-maintenance e-learning course represent the whole population of the fourth grad learners (3 male learners +
62 female learners), computer-teachers division at the faculty of specific education-Tanta University.

Data gathering, which occurred from 22/3/2009 to 25/4/2009 entailed “five” interviews (“2” learners + “3” tutors), “four” brainstorming sessions (learners focus groups), and the feedback on the e-learning system from the “65” participated learners, which included “two” forum sessions and “one” chat session.

All interviews and focus groups were recorded, transcribed, and verified. While, the lack of high-speed internet connections in the Egyptian context did not manage the learners from filling up the electronic questionnaire, which forced the researcher to distribute a printed hand-out version of the questionnaire to all the participated learners and collected the responses of the learners who completed filling up the questionnaire “27” learners. At the same time, the VLE stored all the learners’ feedback during their participation in the activities.

Figure 3 from Design to Data Collection of the VLE
Quantitative Data

Quantitative methods were the traditional mode of scientific research in the area of social sciences, especially in eastern cultures which includes Egypt, my home country. This research will use some of the quantitative data collection tools such as:

*Questionnaire:*

Questionnaire will be used to collect the data regarding learners’ opinions about how to implement quality inside e-learning systems and their attitudes toward the e-learning system they undertaken. (See appendix 1)

The questionnaire contains (in its first section) four parts in all of them learners evaluated statements describing positive learning experiences on a five-point scale (ranging from 1 “Strongly disagree” to 5 “Strongly agree”), and in its second section a multiple choice questions to get the learners’ specific opinions regarding their attitudes toward e-learning as a learning delivery method.

The lack of high-speed internet connections in the Egyptian context did not manage the learners from filling up the electronic questionnaire, which forced the researcher to distribute a printed handout version of the questionnaire to all the participated learners and collected the responses of the learners who completed filling up the questionnaire “27” learners. This high percentage of learners’ drop-out over the questionnaire responses was predicted from the researcher because it will be obvious from the results chapter that the learners suffer from lack of trust in the educational system and in any attempt to enhance the Egyptian higher education. Thus, the researcher anticipated that rate of drop-out and did not depend solely on the questionnaire’s results to constitute the research’s conclusions rather than depending on the triangulation that comes out from using many methods and the richness of the data gathered enable the researcher to identify the research’s findings.

*Achievement test:*

As a result of evaluating the learners’ improvement in achievement levels a parametric achievement test is used. “In tests, researchers have at their disposal a powerful method of data collection, an impressive array of tests for gathering data of a numerical rather than verbal kind.” Cohen et al (2000: p. 317). The researcher established this achievement test and make sure of its validity and reliability during his masters research, thus it will be used in this research as a parametric tool after transforming it into an electronic format. “Parametric tests are more powerful than nonparametric tests because they not only derive from standardised scores but enable the researcher to compare sub-populations with a whole population.” Cohen et al (2000: p. 318).
As a result of teaching computer-maintenance curriculum VLE to the whole fourth grade/computer-teacher division/ instructional technology department at the faculty of specific education/ Tanta University, the learners took this exam twice (pre-post): firstly, before they learn with the VLE; secondly, after they have learned using the suggested VLE. (See appendix 6)

**Qualitative data:**
A purely quantitative approach would not be an appropriate methodology to use in order to examine all the meanings beyond the statistical numbers and figures. Thus moving toward a more subjective approach that will enable the research to understand and bring attention to meanings beyond the statistical measurements is needed.

Merriam & Associates (2002: p. 3) stated “the world or reality is not the fixed, single, agreed upon, or measurable phenomenon that it is assumed to be in positivist, quantitative research”. Thus the purpose of the suggested in-depth qualitative tools was to assist in finding multiple constructions and interpretations of the reality of using e-learning as perceived by the available stakeholders.

The qualitative techniques such as interviews and focus groups can be used to provide a description and understanding of the behaviours of the Egyptian learners regarding their learning experiences with the e-learning systems.

A qualitative research design with a focus on personal experience and introspection was selected to discover whether e-learning is a suitable delivery method for Egyptian higher education and to gain insights regarding the effectiveness of the suggested quality e-learning model. This decision was supported by the work of Sherman & Webb (1988: p. 5) who stated “the aim of qualitative research is not verification of a predetermined idea, but discovery that leads to new insights . . . with [a] focus on the natural setting”.

The research makes use of some of the qualitative data collection tools (methods) such as semi-structure interviews and focus groups.

**Interviews**
Interviews were used to meet each of the available stakeholders to collect rich details about the efficacy of the Implemented VLE.

**Focus Group**
Focus Groups are used to enable the researcher to get in depth feedback on the important issues that came out from using the other tools.(Cohen, 2007: p. 288) defined focus groups as “Focus groups are contrived settings, bringing together a specifically chosen sector of the population to discuss a particular given theme or topic, where the interaction with the group leads to data and outcomes.” Supporting
the importance of interactivity inside the focus groups Bloor et al. (2001: p. 19) stated “As focus group participants are not selected by means of systematic random sampling and the success of the group depends, at least in part, on the dynamics between individuals within the group, there are a range of issues that the researcher has to consider in order to compose and conduct a successful group”. As interaction between participants is a key feature of the focus group method careful consideration of group composition is vital. In using the focus groups during this research as a data collecting method, the researcher found himself between two choices during the establishment of groups; to select the members in a random way with its benefits of encouraging discussion between the group members and bearing in mind that bringing together a diverse range of learners may mean that the range of views and experiences may be so distorted that the topic cannot be explored in the desired depth. Bloor et al. (2001: p. 20) stated “Conducting a focus group with diverse individuals who hold conflicting views can result in high levels of conflict which will crush discussion and inhibit debate and indeed may become quite distressing for individuals involved.” The second choice is to enable the learners to choose their own groups according to their preferences, which enable the learners to cooperating in generating a unified group’s opinions. The researcher chose to give learners the ability to construct their own groups upon their preferences and circumstances because it felt more stimulating the e-learning spirits of giving e-learners the freedom to learn when, where, how they like.

Bloor et al. (2001) identified some rules for transcribing the focus group data which have been followed as it appears in:

- Every effort has been made to transcribe all recorded speech;
- Speech has been transcribed as it occurs and not `tidied up';
- Other oral communication, such as laughter have been noted;
- As far as possible, identifying the speaker has taken place.

**Procedures of Data Analysis**

The research contains two related steps linked to the research questions. step one was the implementation of e-learning systems (VLE) to the Egyptian higher education learners in order to get the experience of dealing and using e-learning systems and to get to know the affordances and the abilities of e-learning in delivering any curriculum. This step was essential to give the learners the required experiences to give their valid feedback with an appropriate background.

Step two was to collect and analyse the available stakeholders’ experiences regarding the usage of e-learning system using focus groups, questionnaire, VLE feedback, and interviews. The main aim was to show how far the e-learning system was effective in delivering “Computer maintenance” course to the Egyptian higher education learners.
and more importantly, to know the participants' suggestions, opinions and new ideas that could help accomplishing and evaluating quality in e-learning systems.

This phase is going to contain two stages including open coding, and specific coding process. In the first stage, an open coding process was adopted that centred on devising broad classification for the data collected from the interviews and focus groups. The first level coding process was based largely on identification of broad themes and patterns of issue or concepts, derived primarily from the first line in the suggested analysis framework. For example, the broad classification included all the data related to “before”, “during”, “after”, “positive”, and “negative” of implementing e-learning as a new delivery method. These broad classifications were categorised under “Free Nodes” in the analysis software “NVivo” that enabled the researcher to identify quotations.

Following this a second and more detailed process of classification was devised. For example, with respect to the “positive” themes, new classifications were generated, which included “positive expectations”; “positive outcomes”.

The generated “Free Nodes” were refined in the analysis software “NVivo” where many sub-themes have generated and where the relationships between these themes emerged. Thus, the usage of “Tree Nodes” in the analysis software “NVivo” has enabled the researcher to make the relationships between the generated themes clearer and helped the researcher in constructing the analysis framework, which will lead the rest of the analysis process.

The second stage of analysis centred on devising more specific classification for all the collected data. The second-level coding process was based upon the analysis framework that has been generated during the first stage of analysis.

Additionally, the rigour and the validity of the data analysis processes is in the coding, development of themes, recoding, extracting patterns, and the development of the analysis framework. All these procedures are considered from the grounded methods in the qualitative research (Corbin, 1998; Glaser, 1967).

**Reliability & Validity**

Trustworthiness was achieved using the triangulation the used methods to collect the data including focus groups, interview responses, questionnaire and related research (Creswell, 2007).

**Piloting the Tools**

All the tools used to collect the data were piloted before the actual collection by showing them to five of the researcher’s colleagues in University of Southampton\School of Education to find out the following:
• Examine the questions to see if they fit with the main objectives of the research which demonstrated for them.

• Examine the translation from English to Arabic to make sure it is comprehensive and understandable. The tools pilot file can be viewed in Appendix 3.

• The achievement test has been approved for its validity and reliability during the researcher’s Masters and has been transformed to the electronic format by the researcher (T. S. AbdEl-Gawad, 2007). Moreover to make sure of its accessibility and the easily understood of its questions, it was examined by three of the researcher’s colleagues in both Egypt and Southampton. There correction confounded in rephrasing some texts in Arabic to be easily understood by the Egyptian learners.

• All the experts’ corrections were made to best serve the objectives of the research. (See Appendix 4 for all experts’ names and contributions)

Piloting the qualitative tools
The qualitative data collection methods (interview, focus groups), which used in this research have been constructed as a result of an extensive search of the related literature to help constructing the interview schedule, and the concentration topics of the focus group.

The interview schedule and their translation into Arabic were collected in one table to distribute to the list of experts, whom have the educational background in the Arab region’s education. (See Appendix 3)

The feedbacks from the experts were collected and the corrections they have suggested were taken into account and were made by the researcher. Their suggestions were confounded with some mistakes on the translation into Arabic and rephrasing some of the texts in the interview schedule to be clearer to the Arabic readers.

Questionnaire Validity:
An extensive search of the literature has been done on the concepts of e-learning, the quality of e-learning and the attitudes toward e-learning to help constructing the questionnaire items in order to achieve the content validity.

Content validity refers to whether or not the content of the manifest variables (e.g. questions of a questionnaire) is right to measure the latent concept (attitudes toward e-learning) that the research tries to measure. Thus, “it can be useful to have a panel of experts in the field judge your instrument as well” (Muijs, 2004: p. 66). As a result, primary copies of the questionnaire were distributed to five of the researcher’s colleagues, whom have the required experiences with conducting research in
education inside Arabian countries. They are Abdul Hammed Al-Arfag, Abdul Aziz Al Harby, Mohammed Ageel, Dr. Magged Al-Kahtanny, and Dr. Mariam Al-Aly (See Appendix 4).

The feedbacks from the experts were collected and the corrections they have suggested were taken into account and were made by the researcher. Their suggestions were confounded with some mistakes on the translation and rephrasing some of the texts in the questionnaire items to be clearer to the Arabic readers, and deleting question number (23) from the questionnaire because it has the same meaning as question number (20).

**Questionnaire Reliability:**
Reliability refers to the extent to which test scores are free of measurement error and as conceptualised in quantitative research, has two main forms: repeated measurement and internal consistency (Muijs, 2004: p.71).

There are two main ways of calculating internal consistency reliability: split half reliability and coefficient alpha. Coefficient alpha is the used method to measure the internal consistency of this questionnaire. “We would expect this measure to be over 0.7 before we can say that our questionnaire is internally consistent.” (Muijs, 2004: p.73)

<table>
<thead>
<tr>
<th>Section</th>
<th>No. of items</th>
<th>Cronbach Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Environment</td>
<td>11</td>
<td>.744</td>
</tr>
<tr>
<td>Evaluation during development</td>
<td>4</td>
<td>.771</td>
</tr>
<tr>
<td>Learning Outcomes</td>
<td>11</td>
<td>.862</td>
</tr>
<tr>
<td>Stakeholders’ Satisfaction</td>
<td>7</td>
<td>.859</td>
</tr>
</tbody>
</table>

Table 3 Cronbach Alpha for the different parts of the Questionnaire

From the Cronbach Alpha table, it is obvious that the internal consistency of the responses of the questionnaire parts are acceptable (exceed 0.7 for all the questionnaire parts.)

Because of the acceptable reliability of the questionnaire parts, it could be used as a reliable tool to collect the required data.

**Achievement Test**
The researcher established this achievement test and make sure of its validity and reliability during his masters research, thus it will be used in this research as a parametric tool after transforming it into an electronic format. “Parametric tests are more powerful than nonparametric tests because they not only derive from
standardised scores but enable the researcher to compare sub-populations with a whole population.” Cohen et al (2000: p. 318). The learners took this exam twice (pre-post): firstly, before they learn with the VLE; secondly, after they have learned using the suggested VLE. (See appendix 6)

**Ethics**

The researcher made sure that the participated learners fill up the questionnaire without the physical attendance of the researcher, to make sure that they gave their truthful opinions on the questionnaire questions without any interfere from the researcher.

The research proposal was approved by the University of Southampton ethical committee. For the complete questionnaire refer to Appendix 1. An information letter outlining the purpose and the nature of the research and methodology was given to learners before the beginning of the research. The information letter can be viewed in Appendix 2. Learners were encouraged to contact the researcher through the VLE or by e-mail. In the case of a learner agreeing to be a participant in the research s/he was asked to fill out a consent form which can be viewed in Appendix 2.
Chapter 4 ‘Results’

Implementing a new delivery method into educational systems - especially when it is evolved with using new technologies in an inexperienced society similar to the Egyptian higher education context as it shown from the literature - is a difficult and complex process requiring a lot of attention and care from all the stakeholders involved in the processes of such implementation.

This research tries to investigate the efficacy of e-learning – as a relatively new delivery method – to the Egyptian higher education and to generate a model for implementing and evaluating quality inside e-learning systems.

Literature reviewed in Chapter 2 suggests that an e-learning course aims to provide a flexible learner-centred environment through different means to address learners’ needs, Abd El-Gawad and Woollard (2010: p. 27) have developed a definition of e-learning as:

- An electronic learning processes takes place originally on the Web;
- An organised and well-planed delivery method through which a thoughtful design, implementation and continuous evaluation processes take place;
- The use of new multimedia technologies and the Internet to improve the quality of learning;
- A learning situation that enables learners to learn at any time, place with many reusable resources;
- A rich environment with its activities that make the learner more involved in the learning situation;
- The use of both ‘synchronous’ and ‘asynchronous’ communication tools to enable interactivity between the stakeholders;
- A learning situation that facilitate access to resources and services as well as remote exchanges and collaborations.

Understanding the factors that the participants thought influenced the construction of a new educational delivery system – during all the stages of the implementation process - may help to draw a picture of the ideal stages to implement a new learning delivery method inside the Egyptian higher education.

This research defines “the implementation processes” as the whole processes of designing & realising, constructing, and utilising the e-learning delivery system (VLE).
It was important during the fieldwork study to implement the computer-maintenance e-learning course in order to seek the participants’ views on the possible approaches to achieve quality in e-learning systems within their experience of the work on the implemented “Computer-Maintenance” e-learning system alongside with their experiences with other e-learning systems. Moreover, the other main aim was to discover whether the “computer-maintenance” VLE was successful in achieving its intended aims; to help the learners develop their knowledge, satisfaction, and attitudes toward e-learning as a new learning delivery method for the Egyptian higher education sector.

This chapter represents the analysis results of the participants’ views on e-learning: its efficacy for the Egyptian higher education, and how to guarantee the quality of it. Thus, a case study research approach was applied to collect the views of “65” learners (the learners’ whole society of the educational technology department \ fourth grade learners \ computer-teacher division at the faculty of Specific Education \ Tanta University), and “3” lecturers. The views of the two groups (learners and lecturers) of the available stakeholders were gathered to examine their thinking about the e-learning systems using four different methods to collect their views: questionnaires (for the learners), semi-structured interviews (for the two groups), and their feedback on the e-learning system (for the learners). Learners’ views were explored further in four brainstorming sessions (focus groups).

Any educational systems (whether traditional or e-learning) have to go through multiple stages in order to be successfully implemented as a robust and powerful system. These stages contain main stages and sub-stages that could vary upon the nature of the desired implemented system.

Every new educational system has its pre-implementation expectations and possibilities; some challenges arising during the implementation; and post-implementation outcomes and recommendations for enhancing the system itself. Thus, the analysis results are reviewed in a time-line beginning with the stage “Before” implementing any educational system ending with the stage “After” the implementation, passing by the stage “During” the implementation. Each stage constructed with a number of emerging themes that emerged from the data analysis that considered the interaction between these themes (in both the same stage and between themes in the three stages as well). The framework of analysis reflects the conceptual framework model and is influenced by analysis of nodes. Below, the researcher defines each of these constructs and displays the framework for the analysis process.
As described above, data in this chapter emerges as a series of themes related to a time-line in constructing a new learning delivery system in the Egyptian higher education sector. These themes are shown in the next Figure:

![Timeline for the implementation of e-learning systems](image)

All quotations are from interviews (5), focus groups respondents (4), and the VLE feedback includes (chat session (1) + forums responses (2) forums). All graphs and tables are representations of questionnaire responses and VLE's statistics. These results will be discussed in the next chapter.

The following abbreviations are used: “FG” instead of “Focus Group” followed by the number of the group e.g. FG1, FG2, etc... (first, third, fourth, and seventh groups of learners inside the VLE), then the number given to each learner instead of his/her name (as a pseudonym). “Q” instead of “Questionnaire” followed by the number of the respondent. “I” instead of “Interview” followed by the number of the interviewee e.g. I1, I2, etc... “CHAT” instead of Chat sessions’ Feedback followed by the number of the
learner, which this response has been taken from e.g. CHAT-1, CHAT-2, etc.... "FORUM" instead of Forum session feedback. Then, the number of the forum session followed by the number of the learner who has made this response e.g. FORUM1-1, FORUM1-2, FORUM2-1, FORUM2-2, etc....

The Before Stage
The principle aim for this section is to highlight the possible affordances inside the learning environment before the implementation of a new technological delivery system (e-learning), and to study the hopes, expectations and perceptions of the research participants regarding the efficacy of e-learning systems for the Egyptian higher education before the implementation.

1- Assumptions (Expectations)
The success of any new educational system requires great attention to the expectations of the learners before using this system and their own perceptions to benefit from this system.

Positive Expectations
"My opinion is ... I knew that I will benefit from e-learning because I had had an experience before with learning through the internet and I have benefited from it a lot more than the face-to-face course that I have been studying at the university"

This was FG4-5's expectations to benefit from the "Computer-maintenance e-learning system" before getting involved with the e-learning system. The participant FG4-5 has discussed what she considered as a reason for such positive expectations indicating how she benefited before from the online learning more than the face-to-face sessions.

Moreover the participant FORUM1-24 explained her positive expectations regarding using e-learning. As she puts it:

"I have expected that e-learning will make learning faster, easier, and more efficient."

Additionally, the participant FG4-3 explained that the excitement regarding the new technological experience generated the positive expectations.

"It was a new experience. I really wanted to participate in it because I did not participate in forums, and such alike before and I was exciting. But I have learned a lot from it."

The participant FG4-5 added another important element to be considered when trying to implement a new educational delivery method that is the availability of adequate
experience period of using this new method before judging its failure or success as she puts it.

"If the ministry of higher education decided that learning will be undertaken by e-learning systems. It will be hard at the beginning until we get accustom to it, then it will be easy to use."

In addition, Participant FORUM1-19 declared that:

"E-learning is going to be successful, but it needs time to be prevailed, lots of technological & financial affordances, and it needs to be accepted by us "learners" after have been depending on teachers and too lazy to search for knowledge by ourselves."

The above statements define some of the learners’ positive expectations for learning using e-learning systems.

**Negative Expectations**

The participant I2 answered the question whether she expected to learn anything from the e-learning system with:

"Of course, no; I did not expect to learn anything form this e-learning system, because when I used forums before I did not learn anything, so when you came to tell us that we are going to learn by e-learning system, I said to myself it is going to be useless."

Additionally, the participant FORUM2-22 stated:

"I did not expect to learn easier by e-learning"

On a parallel position, participant FG1-2 showed serious negative expectations that she connected with her dissatisfaction with what she has been learning since she entered the Faculty. As she puts it:

"I did not expect to learn anything from this e-learning system because we did not learn anything useful since we entered this Faculty."

At the same time, the participant I1 answered the same question with:

"No, at the beginning I told myself that you are here to collect some data for your PhD like any other lecturer and you will leave without any benefit for us."

Additionally, the Participant Forum1-16 explained what e-learning needs in order to prevail the Egyptian higher education, as she puts it:

"This e-learning system needs to change the Egyptian education, which is a static and old-fashioned education."
The above statements describe some of the learners’ negative expectations for learning using e-learning systems in the Egyptian higher education context.

Neutral Expectations

The third section of the learners’ expectations of using e-learning systems in learning inside the Egyptian higher education sector is the neutral camp of the participants; the learners whom did not have any expectations at all, they have just participated and decided to give it a go without any previous assumptions for the efficacy of e-learning; this could be shown in FG4-4 statement:

“Yes indeed, I have participated in this e-learning system on the basis of trying. That is it, just for a trial”

The participant FG4-1 explained that this neutral feeling regarding e-learning systems could be caused by the lack of her experiences with e-learning systems or by her desire to have a peace of mind and persuading herself that she has tried it and did not learn anything as she puts it:

“When I first heard about this e-learning system I told myself that I will not benefit anything from this system, and I said to myself why not to try it maybe it will be the first and the last time to learn by these systems.”

Learners’ expectations regarding e-learning systems (whether positive, negative, or neutral) were taken into account as a guidance to discuss whether the learners think that these expectations have been fulfilled by the implemented VLE and to discuss learners’ expectations’ implications on the other main themes in the analysis framework.

2- Learning Environments possibilities

In order to know the possibilities of success for any new educational system, a serious study for the learning environment should be carry out in order to know the basics that the present environment had, and the affordances that the new educational system has to offer for the learning environment to success in achieving its aims.

Technological Affordances

It was important to evaluate as much as possible the availability of modern technological affordances inside the Egyptian higher education learning environment before the implementation of e-learning in the Egyptian higher education. As the participant FORUM2-15 has stated:

“Technological affordances are important factor in the success of e-learning, because learners want an interactive experiment that is more than a bunch of lectures, which could be printed or a forum to ask some questions. Therefore,
the importance of asynchronous activities and the Internet connectivity that learners need appears.”

The problem regarding the technological affordances is as the participant FG7-2 puts it:

“The entire problem was the unavailability of Internet connection.”

In addition, FG7-1 stated:

“At least, there should be an Internet connection for every student in his/her home.”

Moreover, the FG7-1 explained the necessity of technological affordances for the success of e-learning systems:

“Yes, in order to successfully implement these e-learning systems, you have to provide the learners with the required affordances.”

This could be reinforced by the FG4-5 statement:

“The basic foundation for this system is the Internet, if we guarantee that a respectable Internet connection is available and do not go down frequently, this system will succeed because it save us a lot of time and effort.”

The answers of the participants FG1-1 and FG1-2 to the question about the difficulties they have faced during studying with the Computer-Maintenance e-learning system indicate that the lack of technological affordances was the most crucial problem that the participants faced during their learning with the e-learning system, as they answer:

“The most persistent problem is that when you need the e-learning system and the Internet connection is down.”

“The technological failure, like if you need to use the e-learning system and you don’t have Internet connection in your home.”

The participant FG7-1 explains that the technological affordances insufficiency prevent her from developing his learning by utilising e-learning. As she puts it:

“We do have the motivation to use e-learning systems, if I only have the affordances, believe me, I would have accomplished something good with it.”

In addition, the I5 participant explained in more details the technological affordances’ importance as she puts it:

“E-learning systems have proven their efficacy in enhancing and developing learning and this is has been proven by many research which conducted in the field of e-learning. This does not eliminate the presence of some problems in applying full e-learning systems in managing educational processes in the
Egyptian higher education such as: the absence of financial and technological affordances for fully benefit from such systems.”

Moreover, participant I4 explained what is missing in the Egyptian higher education to adapt e-learning system in:

“We still missing that the Internet connection to be free inside our universities whether it is wired or wireless (WIFI). In addition, with the presence of research and official institutions such as Egyptian universities and the E-learning centre who knows how to build e-learning systems, the usage of e-learning will be massive.”

In addition, the participant FG1-3 defines the absence of the respected high-speed Internet connection and advanced computers inside the Egyptian higher education institutions as the most important components of the successful e-learning systems. Or as she puts it:

“Most of the computers in the laboratories are old fashion technology which does not even permit me to browse the Internet.”

The participant FG7-3 summarises the benefits of e-learning in:

“E-learning is very good in the way it saves me a lot of time and efforts which were lost in transportation to and from my faculty. Nevertheless, the needing for long rest after getting back from faculty ends the day. Moreover, in e-learning I can interact with my tutor at any time, which is a very good affordance that cannot happen frequently in the ordinary learning because the lack of free time for both of us (the tutor and me).”

In addition, the participant FG4-3 defines e-learning environments’ affordances to learners with different preferences and learning styles in:

“The most important affordances of e-learning are that I am not confined with specific time or place to learn. I can learn in my house, in my office and from any place that have a suitable access to the Internet.”

In addition, the participant FG7-4 explained how she benefited from combined with her colleagues in using the e-learning system to accomplish their aims as she puts it:

“We have benefited that we got together on one thing (e-learning) and we gave our opinions on it with freedom and that was very special. The photos were clear, very beautiful, and the video was very good. Honestly, this is better.”

In a parallel position, the participant FG7-5 clarified her own problem using computers and internet and how using e-learning benefited her to overcome this problem. As she puts it:
"Using e-learning systems have made us interact with the internet more frequently and it enabled us to master using Internet links and URLs."

Moreover, she answered “Yes” when the researcher asked her do you still suffer from technophobia despite being in the fourth grade Computer-Teacher division.

**Resources**

Khan (2005: p. 355) stated that “online resources can include multimedia archives, mailing lists and their archives, Frequently Asked Questions (FAQs), glossaries, e-books, dictionaries, calculators, Webliographies, recommended reading lists, digital libraries, computer tutorials, online experts, journals, magazines, newsletters, newspapers, documents, Webfolios (i.e., an electronic version of the portfolio), personal journals (i.e., Web logs or blogs), knowledge management, and so on.”

The official lecturer’s book for each curriculum represented the only available learning resources inside the Egyptian higher education learning environment. There were no activities, whether personalised or collaborative, there were no other source for learning which confined the learners’ knowledge in to the lecturer’s book only. As the participant I4 clarifies:

"Teacher refuses e-learning because s/he feels afraid to lose his/her book. S/he is not imagining that they are two different situations; and by making my curriculum in an e-learning format, I will be more popular and more learners are likely to enrol themselves in my courses."

The participant FG1-3 stated that she benefited from the sources that e-learning system afforded for her as she puts it:

"I have benefited from the e-learning system resources because it was Inclusive; it includes all what we needed to learn, what we have said and the information we exchanged together. They are concentrated in small pages that enable us to focus easily."

In addition, the participant FG4-3 stated that:

"The most important benefit of e-learning resources is that you can enter at any time to see and learn the information you require."

Additionally, the participant FORUM1-16 tried to explain how e-learning helped her, as she puts it:

"Of course, through e-learning we can obtain a lot of resources in a clearer, efficient way, which could help learners’ accomplishment and enable them to have a brilliant future."
These responses highlight the participants’ opinions regarding the affordances of e-learning resources that enable them to fulfil their needs.

**Assessment Tools**

“The routine and regimes which we suffer from at Egypt do not allow learners to be assessed while s/he is setting in his/her home. The word (Assessment) here in Egypt has its own importance in the educational process; there must be an observer attending, a specific place where the assessment process takes place, the assessment process should take place at an authorised educational institution, the assessment process should have a strict timetable previously planned by the ministry of higher education not the learners.”

These were the I4 opinions regarding the assessment tools and procedures inside the Egyptian higher education. The interesting part was the learners’ encouragement for the necessity of an observer for the assessment they will undertake in e-learning systems. As the participant FG7-1 puts it:

“My opinion is that you have to physically see the learner while s/he is answering the test’s questions. You have to be worried that anyone else could answer test’s questions for her/him.”

<table>
<thead>
<tr>
<th>Learning Environment</th>
<th>Comparing criteria</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Do not Know</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am satisfied with using e-learning as a method of delivery</td>
<td>Count</td>
<td>2</td>
<td>18</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
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<td>66.7</td>
<td>7.4</td>
<td>11.1</td>
<td>7.4</td>
</tr>
<tr>
<td>I am satisfied with using e-learning content</td>
<td>Count</td>
<td>4</td>
<td>17</td>
<td>3</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>14.8</td>
<td>63</td>
<td>11.1</td>
<td>11.1</td>
<td>-</td>
</tr>
<tr>
<td>I am satisfied with using e-learning collaboration activities</td>
<td>Count</td>
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<td>20</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>14.8</td>
<td>74.1</td>
<td>7.4</td>
<td>3.7</td>
<td>-</td>
</tr>
<tr>
<td>I believe e-learning can assist teacher-learner interaction</td>
<td>Count</td>
<td>6</td>
<td>14</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>22.2</td>
<td>51.9</td>
<td>11.1</td>
<td>11.1</td>
<td>3.7</td>
</tr>
</tbody>
</table>
I believe e-learning can assist learner-learner interaction  
| Count | 10 | 15 | - | 2 | - |
| Percentage | 37 | 55.6 | - | 7.4 | - |

I am satisfied with using e-learning personalised activities  
| Count | 7 | 13 | 6 | 1 | - |
| Percentage | 25.9 | 48.2 | 22.2 | 3.7 | - |

I believe e-learning can assist me to concentrate on my learning  
| Count | 6 | 13 | 5 | 3 | - |
| Percentage | 22.2 | 48.2 | 18.5 | 11.1 | - |

I am satisfied with using e-learning assessment  
| Count | 2 | 11 | 3 | 9 | 2 |
| Percentage | 7.4 | 40.7 | 11.1 | 33.3 | 7.4 |

I am satisfied with e-learning functions  
| Count | 2 | 15 | 4 | 5 | 1 |
| Percentage | 7.4 | 55.6 | 14.8 | 18.5 | 3.7 |

I believe using e-learning will improve my learning  
| Count | 5 | 12 | 7 | 3 | - |
| Percentage | 18.5 | 44.5 | 25.9 | 11.1 | - |

I am satisfied with the learning reinforcement inside the e-learning  
| Count | 6 | 13 | 5 | 2 | 1 |
| Percentage | 22.2 | 48.2 | 18.5 | 7.4 | 3.7 |

Table 4 the percentage distribution for The Learning Environment Items

In addition, table (4) shows that the participated learners have indicated their dissatisfaction with using the assessment tools inside the e-learning systems with more than 40% of them disagreed (including strongly disagree + disagree) that they
were satisfied with using e-learning assessment. While only 47% of the learners have agreed (including strongly agree + agree).

Available Pre-Skills

The participant FG1-1 opinion regarding the possibilities of using e-learning inside the Egyptian higher education institutions was:

“E-learning could be usable in the higher education sector because everyone knows how to deal with computers and the Internet right now; the proof is that everybody knows how to do chat for example.”

She expected that it could be used efficiently because the required pre-skills are available in the learners of the Egyptian higher education sector. Nevertheless, it is a questionable situation; does the Egyptian higher education learner really possess the required pre-skills for learning with e-learning?

On the contrary, the participant FG7-5 explained her frustration from the comparison between what she has and what she needs to have in order to interact effectively with e-learning; as she puts it:

“Frankly, we were shocked; honestly, I did not study computers seriously as a computer science; yes I had my PC since I was in the secondary school but I did not learn how to use my PC effectively and use much software till I entered the higher education, but before higher education I did not learn anything.”

The participant FG1-2 discussed the topic of tutors’ different abilities in delivering curriculum and the importance of gaining them adequate pre-skills among them. Or as she puts it:

“There are some teachers illiterate with the Internet; honestly, they have to be educated to know how to use the Internet before they can teach us in e-learning systems.”

As a result, the University of Tanta started a training programme for staff members to educate them in the e-learning criteria as the I4 lecturer puts it:

“The University of Tanta has organised a training programme for the university staff to teach them how to learn using e-learning systems in order for them to transfer these experiences to their learners [future teachers] so they can teach their students at schools how to learn with e-learning, which complete the circle.”

Activities

There are multiple activities inside e-learning systems. They could be ordered upon their teaching method dependency from personalised to collaborative attitudes.
The participant FG7-3 explained the Egyptian higher education learners’ tendency to use the personalised activities in:

“The problem is in the personalised work itself; there are some learners prefer to work alone especially the top of their classes. They love to work alone to gain the benefits for themselves only.”

In addition, the participant FG7-4 indicated that there is a learners’ preference toward personalised activities, as she puts it:

“The top of the class love to work alone. Indeed, they suffer from selfishness, they do not want to involve with any of their colleagues and there are some of them prefer to work alone because the long distances which separate them from their colleagues.”

Moreover, the participant FG3-1 prefers to work in personalised activities because of the differences in circumstances between her and the other learners.

“I prefer to work alone. It could be better to work with my colleagues but we could not be able to get together and everyone will be waiting the others that are not benefiting them or me. Our circumstances could be different. How could we unite our circumstances? It is not going to work.”

**The During Stage**

The main aim for this section is to display what happens during the process of implementing e-learning inside the Egyptian higher education, what are the kinds of challenges that face the implementation, what could be the cause for such challenges, and how they could be overcome.

**Time Limitations**

"After a long day at the faculty, starting from 5 pm till 7am including the hustle of travelling to the learners that are not from the city of Tanta. It is expected from us to have the power to study! We still have to eat and pray and have a little sleep before thinking of doing so."

This was the answer of the participant FG7-5 on the question that whether she has enough time to study after she gets back from her faculty. Moreover, the participant FG7-3 defined the problem of overburdening learners and does not enabling them to interact with new methods of learning delivery such as e-learning in:

“Even on Fridays and Saturdays we have to work at home to fulfil our faculty duties and assignments. We do not have time to even log on to the Internet.”

Additionally, the participant FORUM1-14 has explained the pressures that she faces from faculty’s duties. As she puts it:
“Yes, the unavailable time represents a boundary against the usage of e-learning. This lack of time could be referred to the educational overload, which make us do not have the time.”

The participant FG7-2 indicated that the problem with this attendance requirement to the faculty is that it consumes a lot of time and energy and forces her to learn in times could be inadequate. As she puts it:

“There are some things I need to see in the faculty and questions need to be answered. Thus, I had to come to faculty. On the contrary, if I could see them and have answers for my inquiries on line, I would not have been forced to come to the faculty. In the suitable time for me I will log on the Internet and see whatever I need to see.”

In addition, the participant CHAT-31 has discussed her feelings toward the unbearable educational duties. As she puts it:

“If it is in my hand, I would have stayed all the night on line learning with this e-learning system, but you know our circumstances; we have to go every day to faculty and attend all our lectures.”

What the participants stated regards the necessity to attend every day is problematic in e-learning systems because it confined the most significant part in the e-learning system; that is, to learn whenever, wherever is convenient.

**Prerequisite skills**

“We did not know anything about computers till we reached high schools, and still do not know plenty.”

This was the response of the participant FG1-2 when she was asked about her pre-skills before using the e-learning system. In addition, the participant FG1-3 stated:

“Tutors treated us as if we could understand how to deal with computers since our childhood. The truth is that we did not know how to use computers but since the first year for us in the faculty. It was so hard for us in the first year in the faculty to use computers; nobody knew how to use them. We cannot transform form traditional learning into e-learning all of sudden; it needs to be gradually.”

Moreover, the participant CHAT-29 reinforces the idea that she does not possess strong background about how to interact with learning through the Internet. As she puts it:

“No, we do not have good background on how to interact and learn through e-learning websites.”
the participant FG1-2 could not ignore to make a comparison with the more advanced learners in the modern countries, to explain why she thinks that she do not have enough skills to deal with e-learning. As she puts it:

"Indeed, modern countries' learners can use these e-learning systems efficiently. But those learners have the affordances and the possibilities to interact with computers from their childhood, and they know everything but we do not know anything."

On the contrary, the participant FG1-1 thought that the Egyptian higher education learners possess the required skills to interact with e-learning systems. As she puts it:

"In higher education, e-learning could be implemented easily; today, there is no one does not know what the computer is and how to deal with the Internet. As a proof, the most obvious thing is that all the people know how to do chat nowadays."

Thus, it is more important to acknowledge the required pre-skills from the viewpoint of the participants. The participants in this research have added more skills required from their points of view to implement e-learning systems successfully inside the Egyptian higher education. As the participant FG7-1 puts it:

"We are learners living at Egypt, we have learned with the same methods since our first day at school. You cannot compare us with learners since their first day at schools setting in front of computers on line and know how to deal with the Internet from their childhood. They would know what they are doing and what they are talking about."

The participant FG7-2 Surprisingly added prerequisite skills that represent basic skills here in the UK such as: Inappropriate English language levels among Egyptian higher education learners. As she puts it:

“Not the English language! We already suffer from bad English language levels. Everyone has problems with English language. All the learners suffered from this particular part; English language.”

The participant FG7-1 indicated that Egypt suffers from the insufficient technological affordances such as the lack of PCs and the unavailability of high speed Internet connections, beside the defective computer supply in the educational sector. As she puts it:

“The problem is that we do not have Internet connections and we do not have free time to go to Internet cafe and if had time to go to a cafe they tell us that they do not have available places.”

In addition, participant FG7-3 stated:
“We go to Internet cafe. But they are crowded and we do not find available places there, and if we find a place the connection keeps falling destroying our work.”

Additionally, the participant CHAT-16 described his opinion in e-learning and said:

“It is necessary to afford all the required technological possibilities before implementing e-learning, in order not to fail.”

It could be anticipated that the participants would be professionals in interacting with the internet, as they are the next computer-teachers. The participant FG7-1 described her current Prerequisite skills as she do not possess enough skills to deal and master the interaction with the Internet and then with e-learning systems. As she puts it:

“Firstly, you have to teach the Internet skills in order to teach us with e-learning. Learners here do not know how to interact with the Internet. The most important thing is to teach learners these basics skills.”

Moreover, the participant FG7-2 described that she does not know what is required to interact and learn by e-learning systems. As she puts it:

“There was a bit of confusion in interacting with Internet properly; I do not know how to do everything in Internet.”

In addition, the participant FG7-3 reflected on the insufficient Internet skills as a challenge for implementing e-learning systems inside the Egyptian higher education sector. As she puts it:

“The educational system since primary school till now did not provide us with anything that could be used in e-learning systems. For instance, we did not study Internet. The Egyptian higher education authority is adopting new methods and techniques from foreign countries to implement them without any consideration to our circumstances; how we brought up since the beginning. We buy the socks first and then looking for the shoes. What supposed to happen that we bring each student and know what s/he knows in order for me as authority to know what s/he should learn in order to fit with the new educational delivery method (e-learning).”

Learners’ statements that they do not possess the level of skills they feel is necessary for them to interact effectively with e-learning systems represented a challenge from their point of view.

The participant FG3-2 indicated that one of the most interesting challenges that faced the implementation of e-learning inside the Egyptian higher education, which emerged as a main theme from the participants opinions regarding the prerequisite skills, is the preferences toward more personalisation of the work instead of supporting the collaborative work between the participated learners. As puts it:
"I work alone better."

Despite this tendency to personalising the learning environment, participated learners have declared that they are satisfied with using e-learning personalised activities with more than 74% of the participated learners are satisfied with the personalised activities inside the implemented e-learning system. On the contrary, less than 4% are not satisfied with such activities. (See table (4))

Although this preference for personalised activities, learners also declared that they have benefited from both kinds of activities (personalised + collaborative) as the participant FORUM2-29 puts it:

"I have been able to accomplish what I have expected to learn from all the personal and collaborative activities in e-learning."

The questionnaire also reveals that learners are satisfied with the collaboration activities inside the implemented e-learning system with more than 88% of the learners have agreed (including strongly agree + agree) that they are satisfied with using the collaboration activities inside the e-learning system. On the other hand, almost 3.7% did not agree (including disagree + strongly disagree) that they are satisfied with using collaboration activities in the implemented e-learning system. (See table (4))

The participant FG3-1 describes that this tendency to personalising the learning environments could be because of the differences in the available times for each learner. As she puts it:

"My circumstances are different from others. How could we eliminate these differences? We cannot. To work alone is better."

The participant FG3-4 shows an understanding for the benefits and challenges of collaborative method of learning. As she puts it:

"The collaborative learning is good and not good; it is good in the collaboration between us in knowledge and opinions and we came up with new information that we did not have any idea about before. It is not good in the differences between us in the available times because we cannot agree on a specific time to meet online. Hence, it breaks our online meetings."

The last prerequisite skill that the participants indicated its necessity for the successful implementation of e-learning into the Egyptian higher education sector was the skilful understanding tutors. As the participant FG1-2 puts it:

"There are tutors are illiterate with the Internet. Really, you have to educate them first before you let them teach learners with e-learning systems."

In addition, the participant FG4-3 describes a very strange situation happened to her in the training programme to be a teacher in:
“During my training programme to be a teacher in high schools, we had to teach visual basic (programming language) and we did not learn it before in the faculty. Therefore, we asked the original teacher in the class for help. He said ignore it; do not talk about it and the learners will not notice!”

The participant I5 who is a university tutor with good experiences with implementing and evaluating e-learning systems explained this whole argument around prerequisite skills in:

“E-learning needs time and efforts to teach the learners the required skills to success in using it in what is called “prerequisite skills” because the Egyptian learners do not know basically the required skills to operate computers. Thus, they need a training course to gain them the required skills to interact with computers and e-learning environments.”

Implementing e-learning systems in to the Egyptian higher education sector faced many challenges regarding the prerequisite skills, which are needed to successfully implement e-learning. These prerequisite skills challenges from the participants’ point of view were demonstrated above supported by the participants’ views and opinions.

Financial and Technological Challenges

“I had an Internet connection; very powerful one only 200 houses are connecting with this particular connection.”

This was the response of the participant FG3-2 over a question asking if she has an Internet connection at her home. The irony of her reply shows that how weak the technological infrastructure inside the Egyptian community. Many learners could have had an Internet connection but for the low income and the financial problems, they had to share these Internet connections with numbers of other people who suffer from the same financial problems.

The participant FG7-1 indicated that e-learners have to overcome financial challenges if they want successful e-learning systems. As she puts it:

"In order for e-learning to be used by the learners, educational authorities have to afford the required possibilities to the learners."

In addition, participant CHAT-16 stated that:

"Brothers; in order for this e-learning system to succeed, authorities have to afford all the facilities before the implementation of such systems in to the higher education.”

Additionally, participant CHAT-6 stated:
“In Egypt; we do not possess the financial affordances, which enable us to successfully learn with e-learning.”

The participant I4 who is a university tutor with good experiences in implementing and evaluating Web-based learning environments and who works as a member of the quality assurance committee inside Tanta University explained the lack of financial and technological affordances inside the Egyptian higher education. As he puts it:

“In Egypt we do not have the possibilities and affordances to use e-learning ... In my research on “Web-based learning” I was surprised by that only 40% of the learners have their own PCs at home. I remember a researcher who was doing her PhD. on 30 students only two of them had had Internet connection in their homes which endanger her whole research.”

In addition, the participant I5 who is a professor in the educational technology criteria and supervising many research that examines the Egyptian education described the most challenging element to the implementation of e-learning inside higher education in:

“E-learning environments in Egypt suffer from many challenges such as: the insufficient Internet connections and if the Internet connection happens to be available, the speed will not be adequate to enable the learners to interact effectively with the e-learning system.”

Moreover, the participant FG7-1 explained the necessity of financial affordances in:

“Yes indeed, in order to reach the students to fully utilise this method (e-learning), you have to offer them all the affordances that they acquire.”

This is supported by the participant FG4-2 answer over a question regarding the most significant challenge that she faced during learning by the VLE. She said:

“The most challenging element is that the Internet connection is off since a whole week right now, beside the connection is not satisfying anyway.”

The previous participants’ citations regarding the insufficient affordances represent key elements in accomplishing successful implementation of e-learning systems.

**Designing Challenges**

E-learning designers are required to respond alertly and to be fully aware of the challenges they have to overcome in order to create and implement a successful e-learning system or at least an expected successful one.

One of the main challenges that faced the participants and considered as a design challenge is the VLE construction including whether to open the VLE to the Internet.
world, the type of activities and resources to be included in the VLE, and the assessment method to be employed.

“I feel that the e-learning system did not include many things, we only go inside it for specific reasons and that is it. For instance, other VLEs contain many curricula and you can log in to other pages for fun not just for learning purposes.”

This was participant FG1-2 comments over the VLE she has used in this research. She felt unexcited by the e-learning system being restricted only to the curriculum learning resources and activities without any open links to outside Internet pages.

On the contrary, many of the participants in the same group objected to that on the basics that e-learning systems supposed to be a learning environment. As the participant FG1-3 puts it:

“Your own VLE is totally for learning; that is an educational website for specific purpose. I will not leave my learning and start watching any other sites because I have plenty of work to do over the VLE.”

The participant FG7-4 explained that the designers’ ability to mix between activities, which are already known to learners, and new activities is a difficult challenge that faces e-learning designers. As she puts it:

“We do not know how to use WIKIs. Frankly, we did not start using WIKIs until now. We did not use forums before so we did not use them in the e-learning system. We did not know but chat so we have used it.”

In regards to the whole spectrum of activities inside e-learning systems, the participant FG1-1 indicated strong preferences toward chat activity. As the participant puts it:

“We used the chat activity because we are used to it and the other activities did not work.”

In addition, participant FG1-1 highlighted that her group did not understand how to use other activities inside e-learning systems:

“We did not use but chats because we did not understand how the other activities work.”

At the same time participant FG1-3 explained why her group did not use anything other than chat activity in:

“We have used the chat only because it is more convenient.”

Despite the admiration with chat activity spread among many of the participants, WIKIs have gained a lot of preferences to use. As the participant FG4-4 puts it:
"I prefer WIKI because it enables you to see what your colleagues have added and you can edit or add to it. On the contrary, at chat activity it could be very confusing; I could write something that is the same thing my colleague wrote which is very confusing when you read the chat responds."

It is worth mentioning here that WIKIs have never been used inside the Egyptian higher education. Thus, they were very attractive yet very novel for the learners. They liked the idea of the collaborating activities with their colleagues but in the same time felt strange to do them because this was the first time for them to use this kind of activities.

The other main designing challenge that faces e-learning designers is the interface appearance (themes), which demands (from participants’ point of views), careful attention to all the little details of the interface design such as: font size, colours, pictures, and animations.

The participant FG1-2 answer a question regarding the best font size to read from her point of view in:

“I think size 14 is very suitable.”

In addition, the participant FG1-3 reinforced this font size when she said:

“The font size 14 is better to seen.”

Many of the participants have shown their preferences toward the usage of font size (14) to write the text inside the VLE.

With regard to the colours of the back and foreground, the participants have divided into two categories: the first supports the bright background and dark colours for the foreground or as the participant, FG7-2 puts it:

“The basic thing is that the background is bright and the foreground colour is dark.”

The second category supported the reverse (dark colours for the background and bright colours for the foreground) or as the participant FG7-4 puts it:

“For myself, I prefer the reverse (the background colour is dark and the foreground is bright).”

In addition, many of the participants have been affected by their studying of multimedia production research. Thus, they have suggested that the background should be blue and the foreground colour should be white. As the participant FG7-1 puts it:

“Our tutors say background should be blue and foreground should be white.”

The participant FG7-4 commented over the last statement of participant FG7-1. As she puts it:
"I want to say something, the colours must be clear for me. They said Blue for background and White for foreground in order not to grab our attention. But my opinion is that we are adults and will not be massively affected by these colours."

The usage of pictures and animations inside e-learning systems was an important issue in the Egyptian higher education participants’ feedback. Many of the participants agreed that using pictures and animations could attract them to use a VLE. As the participant FG7-1 puts it:

"Using animated pictures will be a beautiful thing to do in e-learning systems."

In addition, the participant FG7-4 commented on the last statement

"The information in this way will attract any person to enter this VLE to see it and knows what is inside it."

Despite this admiration with the use of animations and pictures inside e-learning systems, the participant FG7-4 did not agree on that opinion. Or as she puts it:

"These bright colours and pictures are for children not for us."

The participant FG7-2 represents the compromising opinions between the previous participants’ opinions. As she states it:

"We can use pictures for the curriculum we are learning, or use pictures and animations and connecting them to the information we teach."

Moreover, the participant FG7-1 gives an example for using animation inside the computer-maintenance VLE to serve the educational purpose of the VLE:

"We can use a picture of a computer that opens and shows its parts to the learners."

The last important point, which has been made by the participants regarding the VLE’s interface appearance, was the necessity of connecting the resources files with a descriptive title for these files. As the participant I2 puts it:

"Sometimes, I did not enter to a link because I did not know what it contains before I open it. Opening it could take long time if it is opened in the first place. Thus I did not open them."

The slow internet connection in Egypt did not allow the learners to serve the VLE’s links as they want. Thus, the learners started to adjust with the slow connections by just opening the links they are sure they need them immediately disregarding any other links they do not know for sure its content because they cannot risk staying too long for opening a link they do not need it right now. As a result, the participants saw it is important to give a descriptive title for each resource you are going to add to your
VLE, this title should be identifying the type of the resource such as (video, text file, power point...).

**Administrative (Authority) Challenges**

Learners’ preferences to face their tutor while learning, represents a serious challenge to the implementation of e-learning into the Egyptian higher education sector. As the participant FG4-3 puts it:

“I know some of my colleagues do not understand without facing a tutor to teach them. It is necessary for them to have a tutor to explain some points in more details.”

The participant FG7-2 explained the reasons for this preference toward face-to-face learning. As she puts it:

“I did not benefit from the e-learning system. Frankly, I have been learning with FTF for more than 12 years right now with the tutor being there for me to explain whatever I need. All of sudden, I found myself required to learn a curriculum over a VLE! I cannot learn like that. At least for me I do not know about the others.”

Moreover, the participant stated:

“We are learners living at Egypt, we have learned with the same method since our first day at school. You cannot compare us with learners since their first day at schools setting in front of computers on-line and know how to deal with the Internet from their childhood. They would know what they are doing and what they are talking about.”

This familiarity with FTF needs a lot of attention from all the stakeholders in implementing e-learning inside the Egyptian higher education if it is acquired to obtain successful e-learning systems.

On the contrary, many participants stated that it does not matter to learn electronically or FTF because they have done a lot of work over the Internet. Thus, it does not represent a problem for them to learn by themselves through the e-learning system. As the participant FG3-1 puts it:

“The first thing we do when getting back to home to switch on the PC and let it work all the night to be able to finish our projects over the Internet.”

In addition, the participant FG3-4 reinforces this by saying:

“We replace the mouse and keyboard to put our food and after eating we put them back. Honestly, we do not have much time to lose in eating away from or PCs.”
Another major authority challenge that emerges from the data analysis is the necessity of new assessment tools that are capable of dealing effectively with the nature of e-learning systems: where learners and tutors are separated by time and place boundaries, which require methods to ensure the validity of the assessment processes to each learner; and the necessity of periodical assessment to keep the learner focusing on the learning track we acquire for him/her.

The participant FG7-1 stated:

“My point of view is that … the assessment does not operate through the Internet. It could be someone else is there to answer the questions for him/her. You have to be worried anyone could answer instead of the learner.”

In addition, the participant FG1-3 gives a great attention for the periodical assessment. As she puts it:

“We should not wait till the end of the e-learning course to evaluate the learners; we have to evaluate them periodically through the course time.”

The participant FG1-1 reinforces this opinion. As she puts it:

“Periodical assessment is better. Because if you evaluated me at the end of the course you will know my final level only but if you periodically evaluated me, then you will have better chances to discover the faults in the e-learning system and be able to solve these faults.”

Another challenge that the participant saw critical during studying by the e-learning system was the communication with the course tutor; as the participant FG4-2 puts it:

“Through e-learning systems the communication with the tutor could face some challenges such as: their answer could not reach us; it is possible s/he will understand my view in a wrong way; or s/he could mention something and I understand it totally different.”

Additionally, the participant I3 defined electronic communication between the learners and their tutor as crucial. As he puts it:

“The most difficult thing in e-learning systems is communication: to be able to communicate with your learners is a critical point in e-learning. How to communicate with my learners correctly and my answers reach them in an acceptable way, this is the crucial element.”

From the participants’ views, one can see that learners have to be able to communicate efficiently with their tutor through the VLE in order to have a successful implementation of e-learning inside the Egyptian higher education sector.
One of the main points that the participants stressed on, was the necessity of involving all the stakeholders in implementing new e-learning systems inside the Egyptian higher education. As the participant FG1-3 puts it:

“All the stakeholders in the learning process should be involved in the implementation of e-learning courses.”

The participant FG1-1 discussed the usefulness of these recommendations with relation to the design of the Egyptian administrative inner system and its ability to host as many learning delivery methods as possible. As she puts it:

“We have to eliminate the Internet illiterate among tutors and change learning authorities’ minds before we enter e-learning arena.”

In addition, the participant FG4-2 reinforces the necessity of changing the present administrative system to be able to host e-learning systems. As she puts it:

“Egyptian educational institutions and learning authorities should change their minds and way of thinking before getting involved in e-learning. It is not the learners’ thinking who need to be changed, it is the learning authorities who need to change the way they think and proceed regarding the learning processes.”

**Lack of Trust**

The participant FG4-3 indicated that the Egyptian higher education learners have insufficient level of trust in the learning authorities. As she puts it:

“The problem with our faculty is that the lectures timetable is not accurate; we could stay long times waiting for a lecture to start and they postponed or cancelled.”

Additionally, participant CHAT-38 stated:

“May God forgive them; forgive the people who taught us; forgive the ministry of higher education.”

This irony in her supplication to the ministry of higher education -seen as the absolute authority in the Egyptian higher education context- to be forgiven for their faulty decisions, which have lead Egyptian learners to be late in using e-learning systems.

The participant FG3-2 discussed the reflection of this lack of trust upon the curriculum that she undertakes. As puts it:

“Frankly, I would prefer to learn new software. At least, I would have benefited something before I get out of the Faculty know nothing but Power Point and Authorware (computer software).”
The lack of trust in the educational system caused a sense of fear among the learners that they might have been taught out-dated curriculum that would not enable them to interact effectively with their work after graduation.

Participant I4 has his own opinion regarding the lack of trust in the educational systems and he sees it as a consequence of the lack of trust in the learners themselves. As he puts it:

“The bureaucracy in the Egyptian higher education is the cause of that; it does not allow the learner to perform an exam while s/he is setting in his/her home. At Egypt rules and laws which organise the educational institutions does not reinforce e-learning.”

In order for the learners to trust their own educational system, they have to feel that they are trusted by the system. Thus, it is a mutual operation between the educational authorities and the learners, which have to be performed if a successful implementation of e-learning or any other delivery system is desired.

The participants indicated through the previous citations in the “During” stage that implementing e-learning systems inside the Egyptian higher education sector has faced many challenges including time limitation, prerequisite skills, financial and technological challenges, designing challenges, administrative and authorities challenges, and lack of trust.

The “After” stage

This stage is meant to address the outcomes of implementing any educational delivery system inside the higher education sector and in particular, the implementation of e-learning systems inside the Egyptian higher education sector.

As a result of the implementation process of “Computer-maintenance VLE” inside the Egyptian higher education, this research has two main points to talk about in the “After” stage: the outcomes of the implementation process, and the recommendations that were given by the participants to enhance these outcomes in the future.

1. Outcomes of Learning:
At the beginning of the analysis, this stage included five initial themes: critical success factors; stakeholders’ satisfaction; achievement level; knowledge usability; and attitude toward e-learning. However, analysing the data, the researcher found that “learners’ attitude” is already included inside the “stakeholders’ satisfaction”. Thus, this research identifies “satisfaction” as “the learners' positive attitude toward something knowing and fully understanding the negative and positive attributes of this thing.”
Critical Success Factors for e-learning

The adoption of e-learning systems is a complicated process of establishing, implementing and developing entire array of factors to guarantee the successful integration of e-learning into the educational systems.

As a result of analysing the data this research specified numbers of e-learning critical success factors (CSF), which emerged as main themes during the analysis. This term has been used by many researchers to define the elements that can assist higher education institutions to efficiently and effectively adopt e-learning and guarantee the implementation of quality in to these e-learning systems. (Papp, 2000; Selim, 2007)

The specified e-learning CSF, based on stakeholders’ perceptions and experiences, included: the nature of the curriculum content; Tutor characteristics (attitude towards e-learning, proficiency of the technology, and support); learners’ characteristics (computer competency, English language proficiency, and learning style); and technology (usability, affordances and infrastructure). The outcomes of the analysis processes reveal that these factors could be shown as Figure 3.

![Critical Success Factors (CSF)](image)

**A- The nature of the curriculum**

As a result of analysing the data, participants showed a great attention to the nature of the curriculum. For instance, the participant FG4-1 answered a question regarding the factors that guarantee successful e-learning systems in:

“At the beginning, there has to be an adaptation for curriculum to fit with e-learning; not all curriculum are suitable for teaching with e-learning.”

This was her explanation for her opinion that “e-learning is not a suitable suit for everybody”; it cannot adopt any curriculum, these curriculum have to be developed and deployed in a way that fit with the e-learning suit.
The participants meant by the nature of the curriculum to concentrate on the content of the curriculum—whether it is a theoretical content or a pragmatic one.

The participants views regarding the best curriculum nature to fit with the e-learning systems was contradictory; many of them saw that e-learning— from their opinions—is fitting more with the pragmatic curriculum contents, while others declare that they think e-learning courses fit easily with the theoretical curriculum contents.

The participant FG4-2 saw that the theoretical curricula are more likely to be hosted by e-learning systems. As she puts it:

“...On the contrary, theoretical will be easier, there will be no need for a lot of explanations and it will be easier to read and learn.”

In addition, the participant FG4-5 reinforced this opinion. As she puts it:

“Theoretical curriculum will be better using e-learning but not the pragmatic ones.”

Moreover, the participant FG7-4 stated that theoretical curriculum would be much better in both learning and interacting with e-learning or as she stated:

“Theoretical curriculum will be much, much, much more convenience in e-learning systems.”

On the contrary, many learners have indicated that the pragmatic curriculum will be easier to implement in e-learning systems. As the participant FG4-3 puts it:

“Indeed, the theoretical curriculum cannot be implemented in e-learning systems; It does not have but one way to be understood and that is the book way. Thus, I cannot understand it unless I listen to the tutor’s explanation face to face because I will need to ask him/her a question every five minutes. On the contrary, in pragmatic curriculum I can learn with many different methods and tools.”

In addition, participant FG4-3 explained that through e-learning she can overcome the lack of affordances inside the educational institutions and learn pragmatic curriculum easily. As she puts it:

“E-learning enables us to see some elements that we cannot afford to see them with our own eyes in the faculty. Thus, it will be available in the e-learning resources as video, which enable us to see and know about them.”

Additionally, the participant FG4-1 stated:

“It could be because the lack of affordances inside the faculty to see and touch many elements. On the contrary, in video we can see everything without being concern by its availability inside the faculty.”
The nature of the curriculum contents from the participants’ point of views is a basic factor for successful implementation of e-learning.

**B- Tutors’ characteristics**

Learners emphasised the tutor’s expertise in the successful implementation of e-learning courses. Compared to ordinary classroom instruction, e-learning tutors are faced with additional tasks. For example, The participant FG3-2 explained the tutors’ characteristics in:

"The tutor who designed an e-learning course must be skilful in this curriculum, understanding the learners’ nature in a profound way, and considering for the learners’ circumstances."

At the same time the participant FG3-4 added an additional characteristic of successful e-learning tutor that is, loving the curriculum s/he teaches. As she puts it:

"One of the boundaries of a successful tutor is the possibility that a tutor could teach a curriculum that s/he does not like because s/he is forced by the authorities."

At the same time, the participant I3 added another important characteristic for the successful tutor as he stated:

"Unfortunately, communication in e-learning is far more difficult than in the FTF learning. Thus, if the tutor is a failure communicator in FTF learning I suspect s/he will be more failure in e-learning. This is from experience with both methods of delivery."

In addition, the participant I5 provided a specific description for the successful e-learning tutor in:

"The successful e-learning tutors have to believe in e-learning as a delivery method and s/he has to obtain certain characteristics such as: understanding; realising his/her part in the learning process using e-learning systems; and fully aware of the cons and pros of e-learning systems."

These points could highlight some of the main characteristics for the successful e-learning tutors, which emerged from the participants’ views and opinions such as: they have to develop coherent and well-structured resources that are also technically well designed (in which case they will design the system as well as the content); provide challenging opportunities for e-learning activities whether it is personalised or collaborative activities; loving the curriculum s/he teaches; giving fast feedback to the learners.
C- Learners’ characteristics

Egyptian higher education learners have their own characteristics, which could represent serious threats to the successful implementation of e-learning. The first factor in the learners’ characteristics was the deficiency of English language levels among the learners. This deficiency in the English language is shown in complaints of the participants from the video files which were in English. As the participant FG4-3 puts it:

“The English video was difficult to understand; there were talks with very difficult accent to understand.”

Additionally, the participant FG4-1 stated:

“The English explanations need someone experience in English language; it is not just someone knows a little bit of English could understand them. It needs someone his native tongue is English.”

The participant FG7-2 indicated that the familiarity with a certain learning delivery method without giving chances for learners to experience other new methods of delivery could be another critical success factor. As she puts it:

“I have been learning with FTF for more than 12 years right now with the tutor being there for me to explain whatever I need. All of sudden, I found myself required to learn a curriculum over a VLE! I cannot learn like that. At least for me I do not know about the others.”

Another dimension added by the participants to the learners’ characteristics critical success factor is the learners’ computer and internet competency. As the participant I5 puts it:

“E-learning needs time and efforts to teach the learners the required skills to success in using it in what is called "prerequisite skills" because the Egyptian learners do not know basically the required skills to operate computers. Thus, they need a training course to gain them the required skills to interact with computers and e-learning environments.”

The last dimension in the learners’ characteristics success factor is learning style for the learners or their preferences in learning. Whether the learner is dependent or independent could make a difference in making an e-learning system successful or not. As the participant FG7-2 explained her preferences to learn depending on her tutor in:

“I used to learn through the Internet just when I am forced to do so. For instance, when our tutor asks us to do a research on the Internet; in such cases I am forced to use the Internet to do the research but not for learning by myself.”
In addition, the participant FG1-2 reinforced the effect of the learning style in determines the success of e-learning systems. Or as she puts it:

"Nevertheless, there are certain topics I could not understand by my own; someone has to explain them for me because I will not understand everything alone."

The last statement could show that the learner’s learning style have interfered with her ability to fully engage with the e-learning system. Although some of the participants have referred this to the unfamiliarity with e-learning as a new method of delivery. As the participant FG7-1 puts it:

"It could be because we have been learning with the traditional method for long times. How could we change it in such a short time?"

The participant FG1-2 gives a suggestion for the unfamiliarity with e-learning systems as she puts it:

"There should be educational courses to learners to get them to know how to learn with e-learning and how to interact with the computer alone without anyone beside him to help."

Whether it is the learners’ learning style or the familiarity with the e-learning systems, this dimension needs an attention because from the participants’ views it represents a critical success factor for e-learning systems inside the Egyptian higher education.

**D- Technology**

"The only boundary for successful e-learning is that there are no affordances for it in the first place. The problem is not relating to whether we want to use it in learning or not. It is all about affordances."

These were the words of the participant FG7-4 in respond to a question about what have represented a boundary in front of her learning with the “computer-maintenance” VLE.

In addition, the participant FG7-1 defined some elements to be addressed if a successful e-learning system is wanted in:

"Affordances, we are shortage in affordances, the fresher to study Internet & the principals of e-learning, and of course the computers; you can see only two or three devices are working, or should we afford our own devices?!"

From the participants’ point of views financial and technical affordances represent a critical success factor for the implementation of e-learning into the Egyptian higher education.
Stakeholders’ Satisfaction of E-learning

This research has identified the stakeholders in implementing any e-learning systems in six stakeholders. They are Students; Instructors; Educational Institutions; System Designers; Content Designers; and Accreditors.

For the data collection circumstances, the participants were the whole learners of the fourth grade instructional technology - “Computer-teacher division”; two members of staff who have the background of being system designers and content designers as well; one professor represents the educational institution’s opinions.

The questionnaire analysis shows that the participated learners are satisfied with using the e-learning system as a delivery method with almost 75% of the learners do agree (agreement include strongly agree & agree) that they are satisfied with using e-learning as a method to deliver curriculum while, 18.5% do not agree (disagree includes strongly disagree & disagree). This could be an indication of the overall satisfaction with e-learning as a curriculum delivery method. (See table (4))

In addition, More than two thirds of the learners do agree (agreement include strongly agree & agree) that they are satisfied with using e-learning content to learn their curriculum. However, approximately 11.1% did not satisfy with using the e-learning content in learning. See table (4)

In regards to the learners’ satisfaction with the reinforcements they have inside the e-learning system, almost 70% of the learners are satisfied while almost 11% of them shown their dissatisfaction with the reinforcements inside the e-learning system. (See table (4))

At the beginning of the qualitative analysis of the gathered data, it is important to define what this research means by stakeholders’ satisfaction of e-learning, which could be defined as: “their desire to use it again to learn showing their appreciation to the educational delivery system putting in mind their ability to judge this system by knowing its advantages and disadvantages.”

The participants have shown a great attention to the advantages of e-learning for them. As the participant FG1-1 puts it:

“E-learning has provided me with activities that I could not have found in ordinary learning; for examples, programmes that I design could be shown to my colleagues to evaluate them and to tell me if I get something wrong in them. E-learning is collaborative; I can do a collaborative project with my colleagues and every one of us could be responsible for a part of it and we could exchange opinions.”

In addition, the participant FG1-2 stated:
"The advantages of e-learning are that I learn according to my abilities; if I want to learn now I will, because I am not obliged to attend a lecture in a specific time, which could not suits me."

Moreover, the participant FG4-2 stated:

"The most important advantage is that I could enter to the system any time I need to learn."

Additionally, the participant I3 added another dimension to e-learning advantages. As he said:

"E-learning helps to eliminate the tutors’ personality from the learning processes which makes the tutor’s skill and abilities do not have much influence on the learners."

At the same dimension, the participant I4 stated:

"E-learning systems are capable of providing solutions to real problems that face the learners; they are interesting and grabbing the attention of the learners."

The previous citations indicate that the participants are aware of the advantages of e-learning systems, which lead them to appreciate e-learning systems as a modern educational delivery method. As the participant I4 puts it:

"From what I have seen, learners are very enthusiastic to use e-learning systems... they could stay online interacting with me for five or six hours every day."

The interesting part is to see whether learners are fully aware of the challenges of e-learning which transform their appreciation into satisfaction or they are not aware of these challenges, which make them only fascinated by the new technology and not satisfied with the e-learning systems.

The participant I4 defined what is missing in the Egyptian learning environments to benefit from e-learning systems. As he puts it:

"The important things to afford are: solid basic technological foundation; and to convince learners and their parents that e-learning will accomplish what they all aim for."

Additionally, the participant I5 explained some of the challenges that face the implementation of e-learning inside the Egyptian higher education. As she stated:

"There are some challenges in implementing e-learning systems in the Egyptian higher education such as the lack of technological and financial affordances to accomplish the perfect benefits from such systems, the lack of computer devices connecting to the Internet, and the weak financial status for the learners, which
do not allow them to participate in the Internet services for their unreasonably prices for the medium-income Egyptian citizens."

These citations show that the participants know and are fully aware of the advantages and the challenges that face the implementation of e-learning in the Egyptian higher education sector, which represent the first component of the stakeholders’ satisfaction has been accomplished by the participants. The second component is the participants’ attitudes toward e-learning which could be different between the participants according to their experiences with e-learning and their position, i.e. whether a lecturer or a learner.

The questionnaire results show that learners are having an overall satisfaction regarding using e-learning in delivering Egyptian higher education curriculum. Despite this overall satisfaction, understanding the motivations and the causes to this satisfaction need an in depth discussion.

As a result, the researcher will go through the participants’ respondents regarding their attitudes toward e-learning in two categories: lecturers’ attitudes, and learners’ attitudes.

1- Lecturers’ attitudes:

The instructor does not become less important in e-learning. On the contrary, learners saw the instructor’s support and expertise as especially important for the acquisition of knowledge, skills, competences and course satisfaction. As the participant FG4-1 puts it:

“The tutor has to have a high educational degree; s/he should not be like me. For instance, I do not have much knowledge with regard to my study. Thus, there must be someone who is confident with his/her knowledge and s/he has a high degree in this curriculum.”

Additionally, the participant FG4-5 indicated that e-learning tutors should be considered as a reliable source of knowledge. As she puts it:

“The tutor should be a reliable source of the knowledge.”

Nevertheless, the important question is how do tutors perceive e-learning? Did they look at it as a satisfactory method to deliver their teaching to their learners or not? From the data gathered, the research found a strong agreement between the participants from higher education tutors on the importance of e-learning for the learners’ development. As the participant I5 stated:

“E-learning increases the desire to learn among learners, increase the achievement level, develops the skills, and has proven its efficacy in all the
educational stages. Learners are passionate with e-learning and how to deploy it in the educational process.”

Supporting this opinion, the participant I4 stated:

“If we can afford official and credited e-learning system to the learners and the certificate they will take will be a credited certificate, this will bring more investments to the university and to you as well.”

2- Learners’ attitudes:

With regard to the learners’ attitudes toward e-learning, one cannot see similar admiration with the affordances of e-learning which exists among tutors. Participants’ views from the learners have been contradictory with regard to their attitudes toward e-learning.

Many of the learners have seen e-learning as a solution to the problems that they face with FTF learning. Others saw it as a new method of delivery that needs more time and effort in order to prevail our learning system. On the contrary, there were some of them perceived e-learning as another heavy duty that does not fit and coordinate with their difficult circumstances and the lack of affordances.

The first group of learners was absolutely overwhelmed by the affordances and possibilities of e-learning. As the participant FG1-2 puts it:

“E-learning enables me to learn according to my possibilities; I am not obliged to attend a lecture in a specific time while I am not in the mood to receive any information.”

Moreover, the participant FG4-3 defined the important benefit of e-learning in:

“It was an advantage to enter any time you wish to see and learn any information you want.”

In addition, the participant FG4-3 saw her experience with the "computer-maintenance" VLE as an educating new experience. As she puts it:

“It was a new experience; it was a new experience that I have learned a lot from it.”

Additionally, the participant FG7-4 added another dimension to the benefits of e-learning in her statement:

“We benefited from e-learning to get together on one thing and we gave our opinions on it and this is a remarkable thing indeed. In addition, the photos were clear; very beautiful. The available videos were impressive. Frankly, this is a better way of learning.”
The second group of learners saw it as a new method of delivery that needs more time, efforts, and affordances to be used massively in the Egyptian higher education. As the participant FG7-5 puts it:

"E-learning is good and not; it is not good because I do not have Internet connection at home which make me loss a lot of its advantages, and it is good because it afford me a lot of time and efforts and the information is always there on the VLE."

Additionally, participant FG7-1 supports the necessity of affordance for the successful implementation of e-learning in the Egyptian higher education. As she puts it:

"Yes, in order to reach with the learners to use this method (e-learning) you have to afford all the possibilities for the learners."

While the last group of learners saw that e-learning is a trial to imitate modern countries disregard the Egyptian higher education affordances and circumstances. As the participant FG7-2 puts it:

"Frankly, I have been learning with FTF for more than 12 years right now with the tutor being there for me to explain whatever I need. All of sudden, I found myself required to learn a curriculum over a VLE! I cannot learn like that. At least for me I do not know about the others."

In addition, the participant I1 gives another reason for preferring FTF to e-learning in:

"In some courses I need to see the components of something and touch them by my hand which is difficult to accomplish in e-learning."

Although, some of the participants prefer to learn with FTF learning over e-learning, they did not reject the possibility of using e-learning systems in the future which could be an indication of their own overall satisfaction of using e-learning systems’ affordances to learn. As the I1 participant puts it:

"If we do something like video-conference inside the VLE, this will enable tutors to meet learners at least once a month. This will reinforce the usage of e-learning systems in the future."

There is another important indicator of both (tutors and learners) satisfaction: it is their satisfaction with the interaction facilities inside the e-learning system. Why it is an important part of their satisfaction? The simple answer would be because it is the basic component of any educational delivery method; meaning without the interaction there will be no communication, which leads to loss of the message tutors struggle to pass to their learners.

**Learners’ satisfaction with the interaction facilities inside e-learning systems:**
In the criteria of interaction inside e-learning systems (VLE), one can divide the interaction into tutor-learners’ interaction; learner-learners’ interaction; and VLE-learners’ interaction.

To show the learners’ satisfaction on each category, learners’ responses over the questionnaire is demonstrated in the next tables.

**Tutor-learners’ interaction:**

As an indication for the learners’ satisfaction with the interaction facilities between them and their tutor inside the implemented e-learning system (Computer-maintenance VLE), they have been asked to give their opinions regarding the availability of such interaction inside the implemented VLE. Their responses to the question were in favour of the availability of the tutor-learners’ interaction facilities inside the e-learning course they have undertaken with 88.9% agreeing. (See table “5”)

<table>
<thead>
<tr>
<th>Did the course provide lecture/student interactions?</th>
<th>Comparing criteria</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>24</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Percentage</td>
<td>88.9</td>
<td>11.1</td>
<td></td>
</tr>
</tbody>
</table>

Table 5 the percentage distribution for learners’ views toward tutor-learner interaction in e-learning.

**Learner-learners’ interaction**

At the same level of sanction come the learners’ satisfactions with the learner-to-learner interaction facilities inside the implemented e-learning system, with 88.9% of learners supporting the availability of interaction facilities between learners inside the implemented VLE. (See table “6”)

<table>
<thead>
<tr>
<th>Did the course provide student/student interactions?</th>
<th>Comparing criteria</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>24</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Percentage</td>
<td>88.9</td>
<td>11.1</td>
<td></td>
</tr>
</tbody>
</table>

Table 6 the percentage distribution for learners’ views toward learner-to-learner interaction in e-learning.

**VLE-learners’ interaction**
The interaction between the learners and the e-learning system (VLE) is the third and last type of interaction that faces learners inside e-learning systems. It was necessary to include a question regarding learners’ satisfaction with the networked learning in the implemented e-learning system as an indication on whether learners are truly satisfied with the interaction inside the used VLE.

By analysing the responses of the participants from learners on the question, it turned out that 96.3% of them are acknowledging the availability of networked learning inside the implemented e-learning system. (See table “7”)

<table>
<thead>
<tr>
<th>Did the course provide networked learning (forums, discussions, chat)?</th>
<th>Comparing criteria</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td></td>
<td>26</td>
<td>1</td>
</tr>
<tr>
<td>Percentage</td>
<td></td>
<td>96.3</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Table 7 the percentage distribution for learners’ satisfaction toward networked learning.

Moreover, the learners have agreed that the implemented course have provided them with appropriate collaboration activities with a percentage of 74.1% approving. (See table “8”)

<table>
<thead>
<tr>
<th>Did the course (undertaken one) provide appropriate collaboration activities for you?</th>
<th>Comparing criteria</th>
<th>Yes</th>
<th>no</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td></td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>Percentage</td>
<td></td>
<td>74.1</td>
<td>25.9</td>
</tr>
</tbody>
</table>

Table 8 the percentage distribution for learners’ satisfaction with collaboration activities inside the e-learning.

From the last review of the analysis of the interaction inside e-learning systems, the important question remains whether they are satisfied by these interaction facilities or not?

Learners’ positive attitude toward e-learning systems could be detected from their opinions whether they would have preferred to use another learning delivery method to learn the undertaken course or they still would have preferred to learn it with e-learning? In order to identify this criterion, the questionnaire included a direct question to the learners about their preferences in learning the undertaken course after having the experience of learning it with the implemented e-learning system.
The analysis result of this particular question shows that 66.7% of the participated learners had positive attitudes toward the undertaken e-learning system preferring to undertake the same course - if they had the chance to relearning it and choose the learning delivery method - with e-learning system. (See table “9”)

<table>
<thead>
<tr>
<th>If you had a choice of the methods you delivered your course with which method would you prefer?</th>
<th>Comparing criteria</th>
<th>Paper-Based</th>
<th>E-learning</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>7</td>
<td>18</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Percentage</td>
<td>25.9</td>
<td>66.7</td>
<td>7.4</td>
<td></td>
</tr>
</tbody>
</table>

Table 9 the percentage distribution for learners' preference to use specific delivery method.

From the previous results both conditions of ensuring stakeholders' satisfaction are established; these are the recognition of both the advantages and disadvantages of e-learning and its interactive facilities beside the positive attitudes toward the use of it as a delivery method.

**Achievement Level**

“The amount of information which I gained in e-learning is more than what I could have gained in FTF learning.”

This was the participant FG1-1 view regarding her gains and benefits from using e-learning system. In addition, the participant I1 explained her gains from learning by the VLE in:

“I have gained a lot; there is information that I did not know and there are more explanations by photos and in addition, there is information about the sessions we are going to undertake.”

Additionally, the participant FG7-1 shows a lot of passionate when she talks about the benefits of e-learning for her. As she puts it:

“Its benefits are: I can learn so many things from it which, I can never imagine to learn from books.”

Moreover, the participant FG4-3 stressed the capabilities of e-learning to afford things which are difficult to afford in the FTF learning. As she puts it:

“There are things we cannot see practically in the faculty. Thus e-learning could afford them to us in a video which enable us to see them and to know their contents.”
In the research criteria, the participant I5 indicated that e-learning research, which conducted in the Egyptian higher education, have proven its efficacy in increasing the achievement levels among the Egyptian higher education learners. As she puts it:

"In fact, e-learning systems have proven its efficacy in enhancing and developing education through the research which conducted in e-learning criteria."

The questionnaire analysis shows learners’ recognition of the abilities of e-learning to help them in their study. As it could be seen from table (10) that more than 90% of the participated learners have agreed (agreement includes strongly agree + agree) that e-learning can assist improving their knowledge in the curricula they have learned, while, only 3.7% of the learners disagreed. (See table “10”)

<table>
<thead>
<tr>
<th>Learning Outcomes</th>
<th>Comparing criteria</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Do not Know</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe e-learning can assist improving the student’s knowledge</td>
<td>Count</td>
<td>9</td>
<td>16</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>33.3</td>
<td>59.3</td>
<td>3.7</td>
<td>3.7</td>
<td>-</td>
</tr>
<tr>
<td>I believe e-learning can assist improving the student’s skills (performance)</td>
<td>Count</td>
<td>5</td>
<td>16</td>
<td>4</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>18.5</td>
<td>59.3</td>
<td>14.8</td>
<td>7.4</td>
<td>-</td>
</tr>
<tr>
<td>I believe e-learning can improve learning motivations</td>
<td>Count</td>
<td>5</td>
<td>15</td>
<td>5</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>18.5</td>
<td>55.6</td>
<td>18.5</td>
<td>7.4</td>
<td>-</td>
</tr>
<tr>
<td>I believe e-learning can assist improving the student’s understanding</td>
<td>Count</td>
<td>7</td>
<td>12</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>25.9</td>
<td>44.5</td>
<td>14.8</td>
<td>11.1</td>
<td>3.7</td>
</tr>
<tr>
<td>I intend to use e-learning to assist my learning in the future</td>
<td>Count</td>
<td>5</td>
<td>9</td>
<td>10</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>18.5</td>
<td>33.3</td>
<td>37</td>
<td>11.1</td>
<td>-</td>
</tr>
<tr>
<td>I intend to use e-learning content to assist my learning in the future</td>
<td>Count</td>
<td>6</td>
<td>12</td>
<td>9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>22.2</td>
<td>44.5</td>
<td>33.3</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
I intend to use e-learning activities to assist my learning in the future

<table>
<thead>
<tr>
<th>Count</th>
<th>7</th>
<th>13</th>
<th>6</th>
<th>1</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>25.9</td>
<td>48.2</td>
<td>22.2</td>
<td>3.7</td>
<td>-</td>
</tr>
</tbody>
</table>

I believe e-learning content is informative

<table>
<thead>
<tr>
<th>Count</th>
<th>9</th>
<th>16</th>
<th>-</th>
<th>1</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>33.3</td>
<td>59.3</td>
<td>-</td>
<td>3.7</td>
<td>3.7</td>
</tr>
</tbody>
</table>

I believe e-learning content is useful

<table>
<thead>
<tr>
<th>Count</th>
<th>8</th>
<th>17</th>
<th>1</th>
<th>1</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>29.6</td>
<td>63</td>
<td>3.7</td>
<td>3.7</td>
<td>-</td>
</tr>
</tbody>
</table>

I believe e-learning is a useful method of curriculum delivery

<table>
<thead>
<tr>
<th>Count</th>
<th>2</th>
<th>14</th>
<th>5</th>
<th>5</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>7.4</td>
<td>51.9</td>
<td>18.5</td>
<td>18.5</td>
<td>3.7</td>
</tr>
</tbody>
</table>

I believe I can use the knowledge I gained effectively in my work

<table>
<thead>
<tr>
<th>Count</th>
<th>10</th>
<th>10</th>
<th>5</th>
<th>2</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>37</td>
<td>37</td>
<td>18.5</td>
<td>7.4</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 10 the percentage distribution for The Learning Outcomes Items.

Learners’ satisfaction toward the efficacy of e-learning in enhancing their knowledge represents an indication that e-learning possess such efficacy. Nevertheless, it could be supported by the (achievement test) results, which could confirm or reject the learners’ point of view.

In order to make sure that there are significant differences in the achievement levels between the research group before and after learning with the e-learning system. An achievement test has been taken by the participated learners twice (before and after learning with the VLE) to measure the differences in achievement between the two measures. The significance of differences is calculated using “t-Test”, which lead to the result shown in table (11).

<table>
<thead>
<tr>
<th>Measure</th>
<th>Group</th>
<th>Number</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>Group 1</td>
<td>34</td>
<td>4.09</td>
<td>2.021</td>
<td>11.007</td>
<td>0.001</td>
</tr>
<tr>
<td>Post-test</td>
<td>Group 1</td>
<td>34</td>
<td>7.49</td>
<td>1.626</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11 the significant of (t) to the differences between the learners group in the achievement test in both pre-test and post-test.
As a result of comparing the means of the participants’ two attempts to solve the achievement test (pre and post-test) there is a significant difference between the two measures at the level of lower than 0.0001 in favour of the post-test. This could indicate that learners’ knowledge achievement have increased on the achievement test, which could be a direct result of the use of the implemented VLE, because learners did not learn anything about the taught curriculum but from the implemented VLE (this has been arranged with the tutor of the computer-maintenance curricula).

Additionally, to identify the amount of influence $\eta^2 = \frac{t^2}{(t^2 + df)}$ is calculated, which results as: $\eta^2 = 0.786$. From this, it appears that $\eta^2 > (0.15)$, which shows that the implemented VLE is effective in enhancing the learners’ achievement level in computer-maintenance curricula. Thus, the research anticipates that the developments in the learners’ achievement levels could be due to their learning using the VLE. This anticipation reinforces the learners’ views that e-learning have a positive efficacy on enhancing their knowledge.

In regards with the efficacy of e-learning on the motivation to learn, almost 74% of the learners saw that e-learning can improve their learning motivations, while 7.4% of the learners did not agree on that. At the same time, more than 70% of the participated learners believe that e-learning can assist improving their understanding. On the contrary, Almost 15% of the learners did not agree that e-learning can assist them to improve their understanding.

**Knowledge Usability**

This factor includes two main important elements: the e-learning system ease of use; and the learners’ benefits from the knowledge they have gained by using the e-learning system.

“It is comfortable to learn with, and if the technological and financial possibilities are being afforded, e-learning will be the prevailing delivery method.”

These were the participant’s CHAT-9 statements regarding how easy the usage of the implemented e-learning system was.

In regard with the second bracket of my definition to the Usability - the functionality of the gained knowledge – participant CHAT-35 indicated that it could be beneficial for her in the future studies she will undertake. Or as she puts it:

“Surely, we will need it in the postgraduate research, which we will undertake in the future.”

In addition, the participant CHAT-27 added another dimension to the usability of e-learning systems inside higher education as a general. As she puts it:
"E-learning is giving us the opportunities to learn with all the people, not just the faculties’ learners. This enables us to know new people and benefit from their expertise."

The last statement brings up the abilities of e-learning to produce a social networking that helps e-learners to enhance their future work opportunities. It is important here to mention that this research is not discussing the social network abilities of e-learning rather than identifying the effects of these abilities on reinforcing the usability of e-learning systems (the functionality part)

The gathered quantitative data from the questionnaire have proven that learners are satisfied with the efficacy of e-learning and it shows that they are willing to use it again in addition to their satisfaction regarding e-learning ease of use and the functionality of it in their future lives. (See table "12")

<table>
<thead>
<tr>
<th>Stakeholders’ Satisfaction</th>
<th>Comparing criteria</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Do not Know</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The VLE met my expectations</td>
<td>Count</td>
<td>4</td>
<td>13</td>
<td>6</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>14.8</td>
<td>48.2</td>
<td>22.2</td>
<td>14.8</td>
<td>-</td>
</tr>
<tr>
<td>The e-learning system was effective</td>
<td>Count</td>
<td>5</td>
<td>17</td>
<td>2</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>18.5</td>
<td>63</td>
<td>7.4</td>
<td>11.1</td>
<td>-</td>
</tr>
<tr>
<td>The e-learning system is necessary for teaching the curricula</td>
<td>Count</td>
<td>2</td>
<td>11</td>
<td>8</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>7.4</td>
<td>40.7</td>
<td>29.6</td>
<td>22.2</td>
<td>-</td>
</tr>
<tr>
<td>I feel confident using e-learning systems</td>
<td>Count</td>
<td>2</td>
<td>13</td>
<td>6</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>7.4</td>
<td>48.2</td>
<td>22.2</td>
<td>18.5</td>
<td>3.7</td>
</tr>
<tr>
<td>I feel confident using e-learning content</td>
<td>Count</td>
<td>4</td>
<td>11</td>
<td>6</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>14.8</td>
<td>40.7</td>
<td>22.2</td>
<td>18.5</td>
<td>3.7</td>
</tr>
<tr>
<td>I feel confident using e-learning activities</td>
<td>Count</td>
<td>7</td>
<td>13</td>
<td>3</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>25.9</td>
<td>48.2</td>
<td>11.1</td>
<td>14.8</td>
<td>-</td>
</tr>
</tbody>
</table>
I feel confident using e-learning assessment

<table>
<thead>
<tr>
<th></th>
<th>Count</th>
<th>3</th>
<th>7</th>
<th>6</th>
<th>10</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td></td>
<td>11.1</td>
<td>25.9</td>
<td>22.2</td>
<td>37</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Table 12 the percentage distribution for The Stakeholders’ Satisfaction Items.

As it is appear from table (12) more than 80% of the learners agreed (include strongly agree + agree) that the implemented e-learning system was effective. While, almost 11% of the learners disagreed that the e-learning system they have learned with was effective.

More than 55.5% of the participated learners agreed (include strongly agree + agree) that they feel confident using e-learning systems, while almost 22% of the learners did not agree (include strongly disagree + disagree) that they feel confident using e-learning systems.

At the same level of confident, comes the learners’ confident with using e-learning content. With more than 55% of the learners stating they agree (include strongly agree + agree) that they are confident using e-learning contents. On the contrary, almost 22% of the participated learners did not agree (include strongly disagree + disagree) that they are confident using e-learning contents.

More than 74% of the participated learners have agreed (include strongly agree + agree) that they feel confident using e-learning activities, while only 14.8% of the learners disagreed.

Learners have indicated that the implemented e-learning system has the required ease of use and the required functionality to encourage them to learn using e-learning systems in the future.

In relation to the functionality of the knowledge gained from the e-learning system, as a result of questionnaire analysis in table (10) more than 50% of the learners agreed that they have the intention to use e-learning to assist their learning in the future. While almost 11% did not agree that they will be using e-learning in the future to assist their learning. Strangely, 37% of the learners did not know whether they are going to use e-learning to assist their learning in the future or not.

Equally, come the learners’ intention to use the e-learning content to help their learning in the future, with almost 66% agreeing that they will use the e-learning content to help their learning in the future. No one among learners disagreed that they will be using the e-learning content in their future learning.

Regards the activities in e-learning almost 74% of learners have agreed (includes strongly agree + agree) that they will use the e-learning activities to assist their
learning in the future. This supported by the small percentage of the learners whom disagree to use e-learning activities in the future with less than 4%.

Without any hesitated learner, almost 92% of the learners agreed (includes strongly agree + agree) that the presented e-learning content is informative, while less than 8% of the learners did not agree (includes strongly disagree + disagree) that, the e-learning content was informative.

At the same time, more than 92% of the participated learners agreed that the e-learning content was useful to them. Only less than 4% did not agree that the e-learning content was useful.

More than 59% of the learners agreed that e-learning is a useful method to deliver curriculum, while almost 22% of the learners did not agree that e-learning is a useful method of curriculum delivery. Additionally, almost three quarters of the participated learners agreed that they could use the knowledge they have gained from the e-learning system effectively in their future works. While only 7.4% of the participated learners disagree that, they will be using the knowledge they have gained in their future works.

The last demonstration shows that the participated learners appreciate the abilities of e-learning systems to provide learners with easy to use learning delivery method that enables them to use the gained information in their future lives.

2- Recommendations for enhancing the learning environment

Through the data collection phase, the participants have experienced learning using a VLE with its full and intensive activities and tools. Moreover, during the data collection there were two other researchers doing their quantitative researches on using VLEs to “enhance the Internet curriculum inside the faculty of specific education” on the same fourth grade learners. Thus, they have gained the required experiences to give their recommendations regarding the main elements and factors, which they think will enable implementing successful e-learning systems inside the Egyptian higher education sector, and what constitute quality inside these systems.

These recommendations confined with three categories: learners; designers; and administrative recommendations.

Learners’ Recommendations

The participant FG4-2 recommended e-learners to changing their way of thinking to guarantee the learners’ adoption of e-learning systems and the importance of developing their computer & Internet literacy. As puts it:
“Originally, we need to change the people’s way of thinking; we used to be force to do things or to cooperate with my colleagues. These are things needs to be changed.”

At the next level come recommendations regarding the computer & internet proficiency levels among learners. As the participant FG4-2 puts it:

“For learners, it is essential for them to know the basics of computer and Internet usage before we came and say to him/her you have to use the Internet in order to learn.”

The participants urge e-learning learners to try mastering computer and Internet skills for enabling better participation in e-learning systems. As the participant FG7-5 puts it:

“It is better to make sure before learners join the Faculty that they have the required skills or maybe have the certificate of “ICDL”; in this way we guarantee that they have practiced the required skills and they will be ready to learn using e-learning systems.”

In addition, the participant FG7-1 stressed that gaining the required computer & Internet skills will enable learners to avoid being shocked by the e-learning systems. As she puts it:

“After gaining the required skills, when I teach them using e-learning, this will not be a shock for them. Indeed.”

These views are considered recommendations for e-learners to support their learning opportunities by obtaining the required skills and by having a flexible way of thinking regarding the way they learn.

**Designers’ Recommendations**

These are the participants’ recommendations and suggestions regarding the elements, which they think, should be considered by e-learning designers in order to obtain a successful e-learning implementation inside the Egyptian higher education. These recommendations include the constructions of the e-learning system, and the characteristics of e-learning tutors.

The participants have shown a great attention to the constructions of the e-learning system including the interface, the type of activities to be included inside e-learning systems, and the periodical learners’ achievement assessment.

In regard to the periodical assessment process to the learners’ achievement levels after each unite or each week. The participant FG1-1 encourages any e-learning designer to include a periodical assessment after each unites in a course. As she stated:
“Periodic assessment is important; because if you come to evaluate me by the end of the course only, you will not know my achievement level but in the end of the course. Meaning, you will verdict the e-learning system’s success by the end but if we are evaluated after each week or unite, you will be capable of seeing the mistakes of the VLE and then correct them regularly.”

Regarding the type of activities to be included inside e-learning systems; whether to include personalised and collaborative activities or limit systems with only one of them. The participant FG1-3 stressed on having the two kinds of activities to give the learners the freedom to learn and interact the way they prefer. As she puts it:

"Both kinds of activities; the personalised: to teach him/her to do everything by his own hands and to establish his/her own independent personality. The collaborative: to enable learners to socialise with their peers and to make them co-operating with others in the work."

Although this preference toward include both activities inside e-learning system, the participant FG4-4 was aware of the challenges of the both kinds of activities. As she puts it:

"In the collaborative activities, learners need to set a specific time to meet online. This is very difficult to organise."

Additionally, the participant FG4-3 stated that it comes back to the learners’ preferences and learning style to determine which activity to undertake. As she puts it:

"I prefer to learn alone; because I love to study alone and because my voice is loud."

Regarding the construction of the e-learning interface, the participants have shown great attention to the elements that shape the VLEs’ interface and how they would like them to appear in the VLE interface. They have confined their recommendations to the VLEs’ interface in the next three elements: texts, pictures and shapes, and colours.

The participant FG4-3 explained her preferences regarding the text size in:

"I usually use the font size (13) because it will make it easier to be seen."

Many other participants preferred to use the font size (14) as it is the best comforting size for their eyes. As the participant FG1-3 said:

"The font size 14 is better to seen."

Concerning the colours to be used inside the VLE, the participants have confined them in colours that are relief their eyes. As the participant FG7-1 puts it:
"I want to say something, the colours must be clear for me. They said Blue for background and White for foreground in order not to garb our attention. But my opinion is that we are adults and will not be massively affected by these colours."

In addition, the participant FG7-4 specified the number of the used colours inside the VLE with three colours. As she said:

"Three colours at most; using plenty of colours is suitable for kids not for adults like us."

In concern with pictures and shapes, participants clearly differentiate between using pictures and flash images for educational reasons, which is acceptable, from their point of view, and using them just to show-off, which is not acceptable by the participants because it will distract the learner’s attention away from the learning materials. As the participant FG7-4 puts it:

"The colours are not that important, pictures could be with its normal colours and flash images should not be too flashy; you will not present them to kids otherwise it will be suitable."

Additionally, the participant FG7-2 indicated that these flash images could be used for educational reasons. As she puts it:

"We could put flashes for the curriculum we teach or to link them with the knowledge we teach to the learners."

These were the participants’ recommendations to e-learning designers regarding the construction of the e-learning system.

In regard with the implemented “computer-maintenance VLE”, learners have declared their satisfaction with the designed interface as it could be seen from the next table. (See table 13)

<table>
<thead>
<tr>
<th>Evaluation during Development</th>
<th>Comparing criteria</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Do not Know</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe that the colour of the background was suitable</td>
<td>Count</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>40.7</td>
<td>40.7</td>
<td>14.8</td>
<td>3.7</td>
<td>-</td>
</tr>
<tr>
<td>I believe that the colours of fonts were suitable for my eyes</td>
<td>Count</td>
<td>9</td>
<td>17</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>33.3</td>
<td>63</td>
<td>3.7</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
I believe that the font size was suitable to read

<table>
<thead>
<tr>
<th>I believe that the font size was suitable to read</th>
<th>Count</th>
<th>10</th>
<th>15</th>
<th>1</th>
<th>1</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td></td>
<td>37</td>
<td>55.6</td>
<td>3.7</td>
<td>3.7</td>
<td>-</td>
</tr>
</tbody>
</table>

I believe that the organisation of the content was good

<table>
<thead>
<tr>
<th>I believe that the organisation of the content was good</th>
<th>Count</th>
<th>11</th>
<th>14</th>
<th>2</th>
<th>-</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td></td>
<td>40.7</td>
<td>51.9</td>
<td>7.4</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 13: The percentage distribution for The Evaluation during development Items

From table (13) more than 81% of the participated learners think that the used background colours inside the implemented e-learning system were suitable for them. On the contrary, only 3.7% of the learners do not believe that the used colours for background were suitable. It worth mentioning here that the used background themes in the implemented VLE was "wood" themes.

Regarding learners’ satisfaction with the fonts used inside the implemented "Computer-maintenance VLE" the questionnaire analysis reveals that 96.3%, learners have declared that they believe that the used font colours are suitable for them. Strangely, there is not a single learner has declare his/her disbelieve that the used font colours are suitable for their eyes.

Additionally, more than 91% of the learners believe that the used font sizes in the implemented VLE were suitable to read. While, only 3.7% did not agree with this. It worth mentioning here that the used font sizes are: “14” for the addresses and “12” for the normal text.

More than 92% of the participated learners saw that the organisation of the e-learning system was good. In Support with that, no one of the learners disapproved that the organisation of the e-learning content was good. This might be argued that learners might not quite understood what the question means by “content organisation” and this argument could be reinforced by the 7.4% of the hesitated learners with regard to this particular question.

The analysis of the “Evaluation during Development” Items shows that the participated learners are satisfied with the developed VLE interface appearance (background colours, font colours, font size, and content organisation).

In some situations, the designer of a system could be the tutor for that system, which directs the participants to highlight some of the adjectives they saw important to be obtained by the e-learning tutors such as the fast feedback. As the participant FG4-5 puts it:
“The feedback should be given in adequate time; it is better to be fast not to delay it for one or two months.”

The successful e-learning tutor should be able to give a fast respond to his/her learners to maintain the interactivity established between him/her and the learners.

Another issue of some debate that raised by the participants is the necessity of the tutors to force learners to learn and following their attitudes over the e-learning system and controlling their behaviours by grades or marks. As the participant FG3-4 puts it:

“There must be forcing and a restricted observation upon the learners to learn. For instance, I tell the learners you have to solve this achievement test in three days and if you did not, your grades will be affected.”

Moreover, the participant FG3-4 stated:

“If you let learning free to the learners; to learn without any enforcement or observation, we could possibly learn nothing: it is not possible, it is for sure that we will not learn anything.”

The academic proficiency of the tutor was one of the important characteristics of the e-learning tutor. As the participant FG3-1 puts it:

“Indeed, if the tutor does not understand the curriculum s/he teaches, whatever s/he tries to explain, we will not understand anything.”

It is an essential element to learners to feel that their tutor is capable of delivering the best knowledge to them whether it is through FTF or e-learning system.

**Administrative Recommendations**

The participants’ recommendations to learning administrations included the suitable age for learners to start learning using e-learning systems; who to participate in designing e-learning curriculum; the necessity of decreasing learners’ attendance at faculties to enable them to learn freely by e-learning systems; the necessity of training tutors on how to effectively engage with the online learners; changing the officials’ minds regarding using modern technologies in education; and finally, the necessity of adjust the technologies infrastructure to fit with e-learning demands.

In concern with the right age or educational level for teaching with e-learning systems, the participant FG1-3 preferred to begin using e-learning from primary schools. As she puts it:

“Start from the younger ages not to start with our ages; we are at faculty, it is not right to start with us. No, you have to start from the beginning ages, from primary schools.”

Additionally, participant CHAT-26 stated:
"It was necessary to learn how to interact with this kind of delivery systems (e-learning) in earlier stages from our education."

Regarding who should be involved in designing the e-learning curriculum, the participant FG1-3 stated that it must involve all the stakeholders. As she puts it:

"All the stakeholders in the learning processes should be involved in designing the content of e-learning systems."

The idea that the participants were trying to spread in their feedback is by acquiring the involving of all stakeholders into the implementation processes of e-learning systems inside Egyptian higher education, success in implementing quality inside e-learning systems could be accomplished.

Regarding deceasing the times that learners are obliged to attend at faculties the participant FG1-3 suffered from the lack of available times to use e-learning systems because of the overload caused by the attendance requirements at the faculty in addition to the heavy duties that they required to accomplish. As she puts it:

"From my point of view, if there are days off during the week, there will be a good chance for us to work and enter e-learning systems. Unfortunately, every day we comeback from the faculty tired, exhausted and we have no desire to sit in front of computers to tired our eyes as well."

The attendance requirement is a known method to force learners to attend in the ordinary FTF learning. This method needs reconsideration if the Egyptian authorities are planning to enable e-learning systems on a wider range.

The participant FG1-2 indicated that their tutors are in a bad need of extensive training to enhance their skills regarding dealing with e-learning systems and developing their attitudes in engaging learners to learn using e-learning systems. As she puts it:

"There are tutors are illiterate in the Internet skills, indeed, you have to eliminate their Internet illiteracy before transforming into e-learning."

Changing the officials’ minds and point of views regarding the usefulness of technologies for education has taken lots of times in the researcher’s conversations with the participants in the interviews and in the focuses groups. Many of the participants think that it is a requirement among others to guarantee the successful implementation of e-learning inside the Egyptian higher education, while others consider it as a critical success factor for e-learning in the Egyptian higher education learning environment.

The participant FG4-2 explained the necessity of changing peoples’ views regarding the use of modern technologies in education. As she puts it:
“We desperately need to respect computers and Internet usage in education; people need to think of it as more than a toy. We need to look at computers and Internet as an important matter because we deal with learning by computers and the Internet as a non-important matter.”

The last authorities recommendations from the participants is, the importance of giving much attention to afford the technological and financial aspects that required to effectively engage the Egyptian society with e-learning with its affordances for learners. As the participant CHAT-35 puts it:

“This e-learning is good, but not for us (Egyptian); it needs a lot of affordances, the necessity of understanding tutor to follow our work and if we said something wrong s/he could correct whatever we have said.”

Participants’ statements in this research indicated that in order for e-learning to be successfully implemented inside the Egyptian higher education many elements should be guaranteed and taken care of.
CHAPTER 5 ‘DISCUSSION’

The purpose of this research was to examine the efficacy of e-learning systems for the Egyptian higher education and to present practical recommendations to establish and evaluate quality in e-learning systems. Thus, the research follows an instrumental Case Study to investigate this efficacy of e-learning and to produce a model of implementing and evaluating quality in e-learning systems using semi-structured interviews, questionnaire, focus groups, and a pre-post achievement test to collect the data. The research questions were:

1. What is the suggested model to guide design and evaluate quality in e-learning systems?
2. What is the efficacy of the suggested model in designing and evaluating quality in e-learning systems?
3. What is the efficacy of using e-learning in the Egyptian higher education context?
4. What is the effectiveness of the suggested e-learning approach on students’ achievement level in the computer-maintenance curriculum?
5. What is the effectiveness of computer-maintenance e-learning system on learners’ satisfaction toward e-learning as a delivery method?

In this chapter, each of the research questions will be considered and an answer to the principle question will be discussed including the answer of the sub-questions.

The answer of Research Question 1

The answers of these research questions will be considered in this chapter. The answer to the first research questions "What is the suggested model to guide design and evaluate quality in e-learning systems?" incorporates the sub-questions:

- What is quality in e-learning system?
- How quality could be designed and evaluated inside e-learning systems?
- What are the participants’ recommendations to implement quality inside e-learning systems?

What is quality in e-learning system?

The question "what is a quality in e-learning systems" could be answered in many different ways because quality has different meaning to different people. The researcher answered this question in an article published in the “Hummingbird” (Faculty of Law, Arts and Social Science Doctoral Research Journal) and clarified that
quality in education is a multidimensional concept involving not just only fitness for use or fitness for purpose but also reliability and durability. On a wider range it means the constant seeking for excellence in the educational process (T. S. AbdEl-Gawad, 2010).

The most reasonable cause for the publicity of “Quality in e-learning systems” as a term in modern education is the competition between universities all over the world to encourage learners to participate in their online courses. Inglis (2005: p.2) stated “Universities have wanted to ensure that the standard of the educational products that they have been offering matches the standard of what they are offering onshore.”

Ordinary face to face (FTF) higher education institutions are increasingly making use of e-learning to support the delivery of their courses and in particular, expanding their e-learning provision through the use of web-based technologies for delivering e-learning and blended e-learning courses (Jara, 2009). As a result of the increasing demand of e-learning universities, governments, accreditation bodies are becoming increasingly interested in identifying the appropriate strategies to assure the quality of e-learning (Parker, 2008).

The definitional challenge associated with the concept of quality, along with its associated concepts (such as quality assurance (QA), quality control, quality management, and quality enhancement), stems from the multidimensional criteria of the quality of learning in higher education. Challenges to traditional perspective of quality assurance arise. As Green (1994: p. 3) argued “Since the mid-1980s, public interest in and concern about quality and standards has been intensified by the increasing attention given by successive governments to reforming higher education”. The existing quality assurance processes have significant limitations when it turns to deal with e-learning systems. The Quality Assurance procedures in Higher Education Institutions were designed to assure and enhance the quality of ordinary FTF courses and it is not clear to what extent they remain useful for e-learning courses.

The literature on evaluating the quality in e-learning systems shows that almost all the evaluation process depended on measuring the students’ learning as the only criteria to measure the quality of teaching. Hay et al. (2008: p. 1038) stated “all evaluation depends on measures of ‘fitness for purpose’, and because teaching has purpose only where it supports learning, learning is the only authentic measure of teaching.” But evaluating quality according to learning as the only authentic outcomes is a misunderstanding to the definition of the quality as a mixture of satisfaction:

- Stakeholders’ satisfaction with the e-learning system;

- Authority’s satisfaction with the e-learning outcomes;
• Communities’ satisfaction with regard to the sociological impact of e-learning on students;

• Working market’s satisfaction with regard to the abilities of the graduated students from e-learning systems.

Hay et al. (2008) contends that measuring quality of teaching depending on learning as the only authentic measure is attributable to two important issues. The first is that the learning process is commonly deemed too complex for empirical measurement; the second issue depends on the obvious fact that while teaching can lead to learning, learning is not a necessary outcome of teaching. Indeed there is a strong suggestion in the literature that learning is ultimately a consequence of student behaviour (rather than any direct consequence of the teaching they experience).

Quality, amongst other aspects, is the driving element in assuring the satisfaction of learners with their style differences. In other words, a quality e-learning delivery method is one where any learner with any learning style can find satisfaction. Thus the researcher is arguing that by increasing stakeholders’ satisfaction (among other elements), quality could be increased inside e-learning systems.

**How quality could be designed and evaluated inside e-learning systems?**

Quality in e-learning systems is not a myth or an illusion or an imagination of one researcher or another. It is a fact, considered by many respected researchers in the field of education. The reason for all that argument around its existence comes from the difficulty to implement it in the e-learning systems.

Despite e-learning is the method of delivery that many researchers advocated their research defining its efficacy (New Zealand Council for Educational Research, 2004; Parker, 2008), there are no guarantee that learning by e-learning can overcomes all FTF learning problems. This could be because the provision is not clear enough when it comes to conduct a learning process using e-learning as a delivery method. “Models of learning under E-learning are not as well understood nor accepted as those for traditional higher education learning.” Connolly et al (2005: p. 61)

Measurements (metrics and procedures) need to be designed in order to guarantee the effectiveness and enduring satisfaction of e-learning systems. It is important to clarify any misunderstanding regarding the criteria that should be addressed in order to guarantee the implementation and evaluation of quality in e-learning systems. This can then enable institutions of Higher Education to integrate quality into their e-learning systems reaching to achieve their perspectives of learning.

“The implementation process of e-learning needs to involve all stakeholder groups to develop a relevant online learning strategy and ensure alignment of needs prior to implementation (Newton, 2002: p. 163).” One of the main goals of this research is to
present a systematic and practical model capable of enabling institutions of Egyptian HE with all the possible stakeholders to integrate quality into their e-learning systems. This model for implementing and evaluating quality in e-learning systems was originally made to host all the possible factors that influence the quality of e-learning systems. The model was first proposed by the researchers Abd El-Gawad & Woollard (2009) as a framework for clarifying the purposes of various methods and techniques used to capture the multidimensional aspects of quality in e-learning systems. Then the researchers Abd El-Gawad & Woollard (2010) tried to encompass the suggested model with their own understanding of e-learning as a classless learning delivery method including the available relevant literature. In addition, the suggested model was developed upon the gathered data ending with a model of quality in e-learning system encompasses all the relevant literature and benefited from the real implementation of e-learning systems inside the Egyptian higher education.

In order to capture the multidimensional nature of an e-learning quality system, designers and evaluators need to follow the guidelines from a number of models and frameworks to design a plan that will collect vital information about whether or not system objectives were met and whether best practices were implemented. As a reflection to this challenge, the researcher proposes a model for designing and evaluating quality in e-learning systems incorporating: (1) Stakeholders’ Satisfaction; (2) Learning outcome; (3) Learning Environment; (4) Evaluation during Development.

Figure 6 Quality E-learning Systems Model
What are the participants’ recommendations to implement quality inside e-learning systems?
As a result of the misunderstanding regarding the criteria that should be addressed in order to implement quality inside e-learning systems, the participants explained that many elements need to be addressed in order to achieve quality in e-learning systems.

The recommendations to successful implementation of quality inside e-learning systems in the Egyptian higher education context approached by the participants include: recommendations for learners; recommendations for designers; recommendations for Administrators.

**Recommendations for Learners:**

These recommendations were suggested by the participants to improve the quality of e-learning and to enhance the chances of implementing successful e-learning systems inside the Egyptian higher education sector. The recommendations were changing learners' ways of thinking to guarantee learners' adoption of e-learning systems, and developing the learners' computer & Internet literacy.

Changing the type of thinking was meant to change learners' thoughts about using e-learning as a possible method to deliver learning not as a waste of time this is supported by El-Zayat & Fell (2000); to engage effectively with e-learning trying to get the best out of it. Additionally, trying to change learners' thinking regarding the methods they use to learn; meaning instead of using solely one method of learning they should start navigating other methods. These two changes (from the participants' point of view) are capable of adjusting the Egyptian learners' minds to efficiently engage with e-learning systems and adopt them as delivery method.

Participated learners had different opinions regarding the Egyptian higher education learners' prerequisite skill levels that could be related to the participants' level of self-esteem or because of tutors' differences in the quality of delivered education to them, or because of their preferences toward interacting with computers and Internet.

Nevertheless, the participants urge e-learners to attempt mastering computer and Internet skills for enabling better involvement in e-learning systems. As the participant FG4-2 puts it:

"For learners, it is essential for them to know the basics of computer and Internet usage before we came and say to him/her you have to use the Internet in order to learn."

As a result of the data analysis, it is clear that learners’ aspects of the requirements needed from e-learning learners to effectively engage with e-learning systems include their proficiency in computer and Internet skills, and their recognition of the need to change their thoughts regarding e-learning. In addition, they represent indication
towards what learners perceived as challenges to their success in learning with e-learning systems.

According to the literature, many research have indicated that there are some barriers to the adoption and implementation of successful e-learning systems such as the fact that the user will need to master a new set of skills including the use of online tools, communicate effectively and deal with specific procedures such as passwords, permissions, the need to be open to change, etc. (Ali, 2008; Baldwin-Evans, 2004; New Zealand Council for Educational Research, 2004; Newton, 2002)

As it appears from the analysis, Egyptian higher education learners suffer from the lack of many necessary skills for using e-learning efficiently, e.g. IT skills, mastering the usage of e-learning tools and activities, internet usage skills. This lack of prerequisite skills among new e-learners is supported by literature (Grigg, 1998; Health Libraries Group, 2005: p. 27; Mamary, 2000; Mattheos, 2001; Ouellette, 2002; Washer, 2001).

The participants have given their recommendations to:

- Try to change the learners’ thinking about e-learning systems from a waste of time or leisure activities into a useful delivery method for Egyptian higher education curriculum.
- Learners have to master the necessary skills to interact effectively with e-learning systems.

**Recommendations for Designers:**

The participants’ recommendations to e-learning systems designers include the constructions of the e-learning system, and the characteristics of e-learning tutors.

The participants have shown a great attention to the constructions of the e-learning system, which include (from the participants’ point of views) the interface, the type of activities to be included inside e-learning systems, and the periodical learners’ assessments. In addition, they have raised an issue that represents a debate between e-learning designers whether to extend VLEs abilities to be able to fully deal and interact with the Internet affordances of learning and entertainment or to confine VLEs with learning resources and activities only.

In regard with the Interface design, participants indicated that they prefer the e-learning interface to be designed in font size (14) and they described it as the best comforting size for their eyes; participants confined colours usage in e-learning interface in three colours at most and they stressed that these colours should be employed to relieve their eyes not to distract their learning; participants accepted using pictures and flash images for educational reasons not for just showing-off, which is not acceptable by the participants because it will distract the learner’s attention.
away from the learning materials; participants preferred to manage the VLE in the format of weeks where they are allowed to learn about a certain matter in one week; and they suggested that there should be a descriptive title for each resource and activity in the e-learning system, which identify the type of the resource and activity as well.

As a result, for the analysing of both qualitative and quantitative data, learners consider the VLE interface appearance an important element that any e-learning designer has to take in to account when s/he tries to design a successful e-learning system.

The participants' views regarding the construction of VLE interface was supported by many researchers in the literature. For example, Lehmann & Chamberlin (2009) explained that successful e-learning courses' interface have certain characteristics such as: the interface should be divided into small chunks of information; to be learned easily by learners, e-learning systems should provide alternate text titles for all graphics and captions, written scripts and for all audio and video files, red and yellow colours are difficult colours for those with poor eye sight to see online; thus they agree with the participants recommendation to use colours that do not strain the eyes when designing e-learning systems. This was supported by Ehlers (2004) who explained that for certain learners it is important to use materials that are enriched by multimedia and use not only one but several media resources (audio, visual, movies, texts, etc.).

The last demonstration of literature support for participants' recommendations to e-learning designers regarding the characteristics of the successful interface (from their point of view) clearly show that these recommendations are profound and represent good start points to implement quality inside e-learning systems.

Regarding the type of activities to be included inside e-learning systems; whether to include personalised and collaborative activities or limit the e-learning system with only one of them, the participants stressed on having both kinds of activities to give learners the freedom to learn and interact the way they prefer.

Despite this preference toward the inclusion of both personalised and collaborative activities inside e-learning systems, the participants were aware of the challenges of the both kinds of activities, which could imply that they are fully aware of the principle of e-learning to give learners the freedom to learn utilising his/her own learning style and preferences.

E-learners have a variety of learning styles including dependent learning style (where learners are only learning the whole spectrum of information with the support of others such as tutor). This is not a lack of learning competence (learning to learn)
because predispositions towards learning in a certain way or settings are included in the next learning styles definition.

Learning style includes three main parts, which are defined in the following points:

- **information processing** – habitual modes of perceiving, storing and organising information (for example, pictorially or verbally)
- **instructional preferences** – predispositions towards learning in a certain way (for example, collaboratively or independently) or in a certain setting (for example, time of day, environment)
- **learning strategies** – adaptive responses to learning specific subject matter in a particular context. (CIPD, 2008)

The recommendation of including both personalised and collaborative activities inside e-learning systems is fully supported by many researchers that identified e-learning as a delivery method needs to take place in "learner-centred" environments. That adapt with different learning styles and learners' preferences (Clarke, 2004; Ehlers, 2004; New Zealand Council for Educational Research, 2004; Newton, 2002).

The percentages in table (4) reflected uncertainty of the learners regarding the usage of e-learning assessment. Many reasons could have led to this result such as learners’ preferences toward the assessment procedures that exist inside the Egyptian higher education sector, learners unaccustomed to the use of e-learning assessment tools, unfamiliarity with e-learning systems that lead them to neglect the affordances that e-learning assessment tools can facilitate. Uncertainty may also be due to the lack of trust in the Egyptian educational system. Additionally, their self-esteem could be low because the authorities did not give them the required freedom during their educational stages, which do not allow them even to think that they could be assessed freely without the procedural they used to experience in each test they have undertaken during their educational stages. In addition, learners insisted on the importance of periodical assessment process to the learners’ achievement levels after each unite or each week.

In Egypt, there is a famous saying:

"There is no learning without assessment"

As a result, participants continued to embrace this saying, even in their learning with e-learning. They could not imagine that they would only be assessed once by the end of the VLE course. They are used to being assessed after every unit they learn. Thus, they wanted the same type of learning (including periodical assessment) they are accustomed with. On the other hand, they could have a point in their demands of periodical assessment during learning with e-learning; that it enables both tutors and
learners to realise their weaknesses in an early stage and try to overcome these weaknesses and continue benefiting from the e-learning system they are undertaking.

The necessity of periodical assessment process for both tutors and learners are supported by literature (Coman, 2002; Kingswood, 2011; P. C. Sun, Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D., 2008).

This recommendation regarding the periodical assessment and the relevant connection between it and the Egyptian old saying of “There is no learning without assessment” have forced the researcher to compare this statement with another say but here in the UK and it is:

"Assessment for learning" (Black, 2003)

The comparison between the two sayings clearly shows that Egyptian learners’ views regarding the assessment process as a burden needs to be change in to a different view of it as a complement of the learning process rather than judging that learning have occurred or not.

Regarding the characteristics of e-learning tutors, the participants have explained that e-learning tutors need to obtain certain characteristics such as: reasonably fast feedback, which enables tutors to maintain the interactivity established between him/her and learners; the academic proficiency of the tutor, which enables him/her to deliver the best knowledge to his/her learners; tutors’ ability to monitor and observe his/her learners, which enable him/her to adjust learners’ undesirable behaviours for the completion of learning processes; and tutors’ positive attitudes toward the curriculum s/he teaches, which enables him to spread these positive attitudes to his/her learners.

These characteristics that shared among the participants were also common on studies in the literature review. For example, the literature reveals many adjectives that should be among tutors’ characteristics in e-learning systems to increase e-learning acceptance and satisfaction among learners including “attitude toward learners, technology mastering skills, and attitudes toward using e-learning units in classrooms (Selim, 2010: p. 337).” While tutors are advised to obtain skills training on IT, information literacy, e-learning development for e-learning to be successfully implemented (Health Libraries Group, 2005). Additionally, Ehlers (2004) explained that tutors’ support has been seen as a very important element in judging the quality of an e-learning system, and he stated eight dimensions of tutor’s support including the importance of communication and interaction between the tutor and the learner, an active moderation of learning processes by the tutor, tutors’ abilities to cope with Learners variation in their preferences.
Recommendations for Administrators:

Khan (2005: p. 155) stated that the Infrastructure planning for e-learning, should focus on issues such as (but not limited to):

- What technological and technical capabilities are required to support e-learning;
- What essential skills (i.e., digital literacy) are needed by learners, instructors, and support staff to be successful in changing digital learning environment;
- What standards and guidelines should be followed to create and share learning contents; and
- What policies should be employed for technology infrastructure?

The participants' recommendations for learning administrators included: the necessity of starting learning using e-learning systems in an early age; the importance of involving all the stakeholders in designing e-learning curriculum; the necessity of decreasing learners' attendance requirements at faculties to enable them to learn freely by e-learning systems; the necessity of training tutors on how to effectively engage with the online learners; changing the officials’ minds regarding using modern technologies in education; and finally, the necessity of enhancing the technologies infrastructure to fit with e-learning demands.

Actually, there are many studies support the administrative recommendations that were given by the participants. For example, Selim (2010) explained many success factors that enabling the success implementation of e-learning including: the readiness and reliability of an organisation’s IT infrastructure; computer network functionality and reliability are necessary for succeed; Internet availability on campus is another important enabler of a successful e-learning. Additionally, McPherson & Nunes (2008) explained that the use of new technological tools and artefacts for teaching and learning require technical support by central support units. This goes with the necessity of affording ICT infrastructure, the absence or inadequacy of which will totally hamper the idea of e-learning adoption in universities. There should be provision of computers and high bandwidth to enable the easy flow of classes online (Eke, 2011).

In regards with the importance of implementing training programmes for tutors to effectively engage them with e-learners, McPherson & Nunes (2008) explained the necessity for systematic identification of training needs through programmes of staff review and development and they see this as a crucial critical success factor for e-learning implementation. In addition, Baldwin-Evans (2004: p. 273) stated “Without effective on-going training, the ability of any organisation to compete successfully is under threat.” This reflects the importance of the participants’ recommendation to
support e-learning tutors by implementing training programmes for them on how to engage effectively with e-learners.

In regard to the necessity to change officials minds regarding e-learning as a delivery method, Nichols (2008: p. 10) explained that in order to achieve sustainable e-learning, it is necessary to implement it strategically with clear and open communication channels, sufficient resources, targeted professional development, and a willingness to revise institutional systems so that e-learning ‘fits’ across the entire enterprise. The participants stressed on the strong bonds between the desire to obtain a successful e-learning system and the willingness of changing officials’ minds regarding the importance of e-learning.

It was important to the participants that all the involved stakeholders should participate in implementing e-learning systems for that it will be inclusive to all the views and opinions, which might reflect on the quality of the established e-learning system. This is supported by Newton et al. (2002: p. 163) who stated: “It is evident that there is a need to consider the views of range of stakeholders’ priorities for effective online learning.”

Sloman (2002: p. 164) stated that “the phrase “work-intensive” is often used to characterise modern society. For many people work is interesting, fulfilling, demanding but exhausting: there is always something else of value to do.” Participants shown their frustration regarding the heavy duties required of them and the restricted attendance requirement in the Faculty, which created an intensive work load that does not enable them to interact effectively with e-learning systems.
The answer of Research Question 2

The answer of the second research question: “What is the efficacy of the suggested model in designing and evaluating quality in e-learning systems?” incorporate the answer of the next sub-questions:

- What are the developmental stages to design the quality in e-learning model?
- What are the enhancements to the model that emerged through the data analysis?

What are the developmental stages to design the quality in e-learning model?
The first stage of designing the quality in e-learning systems model comes out from this small model, which named as the first stage. This preliminarily model was meant to address the researcher’s definition for quality in e-learning systems as: a term indicates to a mixture of satisfaction: Stakeholders’ satisfaction with the e-learning system; Authority’s satisfaction with the e-learning outcomes; Communities’ satisfaction with regard to the sociological impact of e-learning on students; Working market’s satisfaction with regard to the abilities of the graduated learners from e-learning systems. It could be true that this model address both the learning outcomes and stakeholders’ satisfaction but it could be argued that it is not satisfactory regarding the satisfaction of communities and the working markets’ satisfaction. This opinion could be argued that in order to reach the satisfaction of these two (communities and working markets), multidimensional elements regarding design and continuous assessment should be addressed.

![Figure 7 the First Stage Model](image)

As a result of reviewing intensive literature regarding quality in e-learning systems and how to implement and evaluate the presence of quality inside e-learning systems, The
quality e-learning systems model was originally suggested to host all the possible factors that influence the quality of e-learning systems (Adey, 1999; S. Alexander, 2001; Allen, 2002; Arbaugh, 2001; J. B. Arbaugh, 2002; J. B. Arbaugh, & Duray, R, 2002; Bates, 1997; Ehlers, 2004; Fabianic, 2002; Hong, 2002; A. Inglis, 1999; Institute of Higher Education Policy, 2000; Lee, 2005; Oliver, 2001; Piccoli, 2001; R. T. Raab, Ellis, W. W., & Abdon, B. R., 2002; Rosenberg, 2001; Smissen, 2002; P. C. Sun, Tsai, R. J., Finger, G., Chen, Y. Y., Yeh, D., 2008; Wagner, 2006; A. Y. Wang, & Newlin, M. H., 2002; Wilkes, 1991; Zhao, 2003). Hence, identifying the possible stakeholders, the criteria which will determine the improvements in the learning outcomes, deciding which elements should be addressed in the design and continuous assessment of the implemented quality e-learning system, and the characteristics of the implemented e-learning system were the developments that have been done to the model to be the second stage model.

Figure 8 the second stage Model

What are the enhancements to the model that emerged through the data analysis?
As a result of the implementation of e-learning inside the Egyptian higher education and through the analysis of the participants' feedback regarding what constitute
quality in e-learning systems and how it could be evaluated inside e-learning systems, the research reaches to some amendments to the suggested model and generates the "Quality e-learning model"

![Quality e-learning model diagram]

Figure 9 quality in e-learning model

Thus, after careful consideration of the related literature and after putting the model on a practical evaluation throughout the implementation of e-learning inside the Egyptian higher education context, the researcher could argue that by addressing the factors shown in this model individually and guaranteeing their satisfaction and autonomy, quality could accomplished in the designed e-learning systems.
The answer of Research Question 3

The answer of the third research question: “What is the efficacy of using e-learning in the Egyptian higher education context?” incorporate the answer of the next sub-questions:

- What were the participants’ expectations before using the e-learning system?
- What are the challenges that face the implementation of e-learning inside the Egyptian higher education sector?
- What are the outcomes of learning by the implemented “computer-maintenance” e-learning system?

What were the participants’ expectations before using the e-learning system?

The learners’ expectations before getting involved in a new learning delivery method provokes learners to either be satisfied with the learning delivery method (if the implemented system has successfully met their expectations) or dissatisfied. Nevertheless, it is important to acknowledge that the success of any new educational system requires great attention to the expectations of the learners before using this system and their own perceptions to benefit from this system.

The participants’ expectations to benefit from e-learning systems in their learning vary between positive, negative, and neutral expectations. This variation could be related to many reasons such as: the last experience with e-learning systems; if it was a good experience then learner’s expectations towards the new e-learning delivery will be positive expectations and vice-versa. This correlates with many research that proved the novelty of the new technologies could be the driver for positive expectations and participations in the new educational systems (Antonacci, 2002; Capper, 2001; Davis, 1989; Garrison, 2003; Hiltz, 1994; Holt, 1995; Papp, 2000), the excitement regarding the new technologies, which “endanger the learners to be seduced by the functionality of the technology, rather than concentrate on its use” (Sloman, 2002: p. 42), satisfaction with what learners have been learning since they start Faculty could determine their expectations toward e-learning; which could be translated as a lack of trust in the educational system. On the contrary (Sloman, 2002: p. 179) argues that “using e-learning will establish more efficient learning.”

Regarding the neutral expectations regarding e-learning systems, this could be caused by the lack of experiences with e-learning. Thus, the research argues that the availability of adequate experiences with e-learning prior judges its failure or success is a crucial matter.

The previous findings appears to sum-up the consensus among learners, that they have positive expectations for learning using e-learning systems, but the elements that
influence these expectations are not quite clear, which could be a good idea for further research.

**What are the challenges that face the implementation of e-learning inside the Egyptian higher education sector?**

Showing case the similar examples could highlight some the challenges that this research could come up with; For instance, Yaghoubi et al. (2008: p. 90) defined many critical problems which face The transaction process from traditional education into a modern one in the Iranian society which could be summarised as following:

- Lack of realistic comprehension concerning the process of learning
- Ambiguous understanding about students' educational needs in different levels
- Defective implementation of computer hardware and software
- Weak IT education
- Weak IT infrastructure
- No realistic point of view or strategic programme for higher education
- Budget and equipment shortages
- Influential atmosphere of political, social and economic situations
- Lack of information literacy

Many themes have generated under the topic of implementation challenges in the analysing of the data, the participants' responds give in-depth indications regarding the challenges that face the Egyptian higher education to transform learning delivery method from FTF into e-learning. These challenges could be summarised in six main challenges that face the implementation of e-learning inside the Egyptian higher education including time limitation, prerequisite skills, financial and technological challenges, designing challenges, administrative challenges, and lack of trust.

Regarding the first challenge concerning with the time limitations, Egyptian higher education learners suffer from travelling long distance every day in an inadequate transportation to reach their faculties, and they are forced to attend lectures all the day by the faculty attendance requirements and after that, return the same distance again going back home, then they are required to eat, drink, pray, help in the home with their families, collect information for required assignments and if they have time- they wish to sleep! The question that raised by the participants is where to find time to practice learning by e-learning?

Before answering this question, it is important to mention that these attendance requirements are contradictory with e-learning spirits in that it confined learners' freedom to learn where , how, when s/he wishes. This is supported by many research
in the e-learning criteria (Kingswood, 2011; Rosenberg, 2001; Sloman, 2002; Wagner, 2006).

It is important if the Egyptian higher education authority’s ambition is to spread the usage of e-learning between the higher education learners, to ease up the attendance requirements to enable learners to have enough time to learn with e-learning systems and give them the breathing space they acquire to effectively engage with e-learning systems.

With regard to the second challenge concerns with prerequisite skills, the participants explain many challenges that relate to the lack or shortage in the prerequisite skills that they think are essential to possess in order to interact efficiently with e-learning systems including the lack of computers and Internet skills, inappropriate English language levels among learners, the preferences toward only one method of learning that is personalisation of the work instead of supporting others methods such as collaborative work, the insufficient numbers of skilful understanding tutors.

It is strongly advised in the literature to try to obtain certain skills to accomplish successful e-learning systems. For example, the e-learners technological skills that is necessary for them to interact effectively with e-learning systems such as IT skills, Internet communications skills, information literacy, e-learning study skills (Health Libraries Group, 2005; Selim, 2010; Sloman, 2002). Additionally, many research shown that the efficient tutors are much more required to achieve successful e-learning systems (Baldwin-Evans, 2004; McPherson, 2008; Selim, 2010). Moreover, research encourage the adaptation of learners’ preferences whether it is toward personalising or collaborative learning in order to implement quality inside e-learning systems (Beaty, 2010; New Zealand Council for Educational Research, 2004; Newton, 2002). This quality is established by guaranteeing the occurrence of many factors and by addressing many elements, which are represented in the suggested model of “quality in e-learning”, and more importantly by overcoming the challenges that constrict its occurrence such as the lost of communication between the learners and the e-learning system (as one type of the communications inside e-learning systems) because the insufficient English language levels among the learners (Beaty, 2010) this dissatisfactory English language level among the participated Egyptian higher education learner prohibited them from navigating tremendous resources over the Internet just because it is written in English.

Regarding the third challenge relating to the lack of financial and technological affordances in the Egyptian higher education context, participants have shown that Egypt suffers from a lot of financial problems including citizens’ low incomes, which leads to the insufficient affordances that keep Egyptian higher education learners holed-handed in dealing and interacting with e-learning systems. Many studies
reinforce the importance of affording the requirements of e-learning before getting to start learning with it such as the high-speed Internet and all the possible financial affordances to support the learners in their learning using e-learning systems (Beaty, 2010; CAUDIT (Council of Australian University Directors of Information Technology), 2010; Health Libraries Group, 2005; Newton, 2002; Selim, 2010).

In regard with the fourth challenge concerning designing, the participants considered many challenges as designer challenges such as the VLE construction; including whether to open the VLE to the Internet world or to restrict it only to the curriculum learning resources and activities, and the type of activities and resources to be included in the VLE.

Woollard (2011: p. 82) stated that “the nature of knowledge in the technology-enabled learning environment is changing. As a consequence, the way in which learners both perceive and acquire knowledge is also changing.” Although e-learners should find whatever resources and activities they need inside the e-learning system walls (because it is supposed to be imitating the real learning environment). Many provisions request to enable them to access the full range of Internet resources (CAUDIT (Council of Australian University Directors of Information Technology), 2010). Or as Health Libraries Group (2005: p. 29) name it “Easy to use, with logical navigation.”

Egyptian higher education learners’ unfamiliarity with some activities such as WIKIs and Forums lead to the lack of learners’ interaction with these activities inside the e-learning system although there previous participation in Chat enabled them to interact effectively with Chat activity in e-learning systems. Hence, learners should be provided with the whole range of activities inside e-learning systems to give them the required experiences that enable them to interact effectively with e-learning (Beaty, 2010; Health Libraries Group, 2005).

Regarding the fifth’s challenge concerning with Administrative, participants indicated that there are some challenges that educational administrative needs to take care of if they need to implement quality in e-learning systems such as Learners’ preferences to face their tutor while learning, the necessity of new assessment tools that are capable of deal effectively with the nature of e-learning systems, the communication with the course tutor.

The familiarity with FTF needs a lot of attention from all the stakeholders in implementing e-learning inside the Egyptian higher education. This familiarity gives the learners feeling of personalisation with their learning environment: each student feels as if the tutor was meant to teach him alone, which gives the feeling of belonging between the learners and their tutors. This is supported by Sloman’s (2002) explanation that e-learning will be most effective for the acquisition of knowledge and least effective where interpersonal interaction is needed for learning.
This challenge could be overcome by the usage of personalisation tools and activities inside e-learning systems to enable the students to feel this belonging and to create their own personalised learning environment inside the used e-learning system (Newton, 2002) and by using blinded e-learning this challenge could be conquered (Bielawski, 2005; Health Libraries Group, 2005; D. H. Lim, Morris, M. L., & Kupritz, V. W., 2006; New Zealand Council for Educational Research, 2004).

The participants have explained that the assessment process in e-learning systems needs some adjustments to be successful (from their opinions) including the necessity of new methods of assessment comes from the nature of e-learning systems, where learners and tutors are separated by time and place boundaries that requires new methods and regulations to ensure the validity of the assessment processes for each learner; and the necessity of periodical assessment to keep the learner focusing on the learning track acquired for him/her.

As a consequence of the participants views an important issue arise that could be questioned in two formats according to the abilities and the openness of the Egyptian authority. The first format of the question is: are the known assessment tools inside e-learning are capable of covering the Egyptian higher education authority's demands? Alternatively, the second format of the question could be: is the Egyptian higher education authority ready to change its views regarding the assessment process to become accustomed with e-learning assessment tools? The Egyptian higher education authority needs to ask itself the right format of the previous question and answer it upon its prevision and hopes of using e-learning systems in the higher education sector. Many research in the literature have given recommendations and guidance to perform an efficient assessment operations in e-learning systems and the benefits of them to the educational authorities (Clarke, 2004; Woollard, 2011). In addition, literature has supported the participants’ recommendation for periodical assessment (Coman, 2002; Kingswood, 2011; Sun, Tsai, Finger, Chen, & Yeh, 2008).

The participants stressed in their feedback on the necessity of reliable, consistent, and fast communication with the course tutor. This is supported for its necessity in guaranteeing the interactivity between learners and their tutors in e-learning systems (CAUDIT (Council of Australian University Directors of Information Technology), 2010) (Health Libraries Group, 2005; Selim, 2010; Sloman, 2002).

In regard with the six’s challenge concerning the lack of trust in the educational system, this lack of trust can be seen in the participant CHAT-38 statement:

"May God forgive them; forgive the people who taught us; forgive the ministry of higher education."
This irony in her supplication to the God against the ministry of higher education—seen as the absolute authority in the Egyptian higher education context—to be forgiven for their faulty decisions, which have lead Egyptian learners to be late in using e-learning systems. The reflection of untrustworthy of the Egyptian educational system caused a sense of fear among the learners that they might have been taught outdate curriculum that would not enable them to interact effectively with their work after graduation. In order to overcome this challenge Egyptian educational institutions need to take a supportive position for their learners by any possible means such as affording the required technology, giving them training programmes on how to engage with e-learning, guaranteeing the reliability and durability of the course communication, and easy access to the learning environment (CAUDIT (Council of Australian University Directors of Information Technology), 2010; Health Libraries Group, 2005; New Zealand Council for Educational Research, 2004; Selim, 2010)

What are the outcomes of learning by the implemented “computer-maintenance” e-learning system?

The analyses of the participants’ feedback give an additional dimension to the possible outcomes of implementing e-learning in the Egyptian higher education, which is “Critical Success Factors” (CSF); the research was interested in certain expected outcomes of e-learning, which are learners’ satisfaction, knowledge usability, and e-learning’s impact on the achievement level of the Egyptian higher education learners.

Regarding the CSF “Critical Success Factors”, the participants identify important factors that they see as crucial to the successful implementation of e-learning inside the Egyptian higher education sector. (See figure No. 2)

The research specifies numbers of e-learning critical success factors (CSF). This term has been used by many researchers to define the elements that can assist higher education institutions to efficiently and effectively adopt e-learning and guarantee the implementation of quality in to these e-learning systems. (Papp, 2000; Selim, 2007)

The specified e-learning (CSF) based on stakeholders’ perceptions and experiences included: the nature of the curriculum content; Tutor characteristics (attitude towards e-learning, proficiency of the technology, and support); learners’ characteristics (computer competency, English language proficiency, and learning style); and technology (usability, affordances and infrastructure). These factors are supported by the literature. For example, Papp (2000) investigated distance learning and suggested some critical success factors (CSFs) that can assist Educational institutions in developing e-learning systems. They included intellectual property, suitability of the course for e-learning environment, building the e-learning course, e-learning course content, e-learning course maintenance, e-learning platform, and measuring the success of an e-learning course. While, Benigno and Trentin (2000) considered factors
such as student characteristics, student–student interaction, effective support, learning materials, learning environment and information technology. Additionally, Yaghoubi et al. (2008: p. 90) defined many critical problems, which face The transaction process from traditional education into a modern one including Defective implementation of computer hardware and software, weak IT infrastructure, the absence of the realistic point of view or strategic programme for higher education, moreover, Selim (2010: p. 338) stated that “the instructor’s attitude toward e-learning, learners, and his/her mastery of the technology is motivating the learners to accept e-learning.

The factors that the participants identify are supported by literature that suggested other factors and explained their importance for the successful implementation of e-learning systems (Ali, 2008; Coman, 2002; Jara, 2009; McPherson, 2008; New Zealand Council for Educational Research, 2004).

Paechter et al. (2010) defined many factors that strongly contribute to learning achievements and course satisfaction such as: students’ achievement goals; the instructor; students’ motivation; opportunities for self-regulated & collaborative learning; and the clarity of the course structure.

In regard with learners’ satisfaction with e-learning as a delivery method, The questionnaire analysis clearly shows that the participated learners are satisfied with using the e-learning system as a delivery method with Almost 75% of the learners do agree (agreement include strongly agree & agree) that they are satisfied with using e-learning as a method to deliver curriculum while, 18.5% do not agree (disagree includes strongly disagree & disagree). Learners’ satisfaction with e-learning systems included: learners’ satisfaction with e-learning content with More than two thirds of the participated learners satisfied with it, learners’ satisfaction with the reinforcements they have inside the e-learning system with Almost 70% of the learners satisfied, learners’ satisfaction with the interaction facilities (including all the types of interaction) inside the e-learning system. This could be an indication of the overall satisfaction with e-learning as a curriculum delivery method. See tables (4), (5), (6), (7)

This research defines learners’ satisfaction of e-learning as “their desire to use it again to learn showing their appreciation to the educational delivery system putting in mind their ability to judge this system by knowing its advantages and disadvantages.” Sun et al. (2008: p. 1196) stated that “An unsatisfactory perception will hamper students’ motivation to continue their distance education.” Hence, it is important to maintain e-learners’ satisfaction to guarantee their completion of the course.

“There is no gain without pain”, this wisdom as seen from the participants’ views is the main criteria to judge the participants’ satisfaction. The participants’ ability to know and understand the challenges as well as the advantages of e-learning and the participants’ positive attitudes and motivations toward e-learning are not the only
factors that indicate his/her satisfaction with the e-learning system, but their acknowledge that it is going to face some challenges in order to prevail the Egyptian higher education system, which will enable them and their future colleagues to achieve their goal from using e-learning to learn is the real indicator for such satisfaction.

The overall satisfaction of the participated learners with e-learning systems is supported by literature (CAUDIT, 2010; Hong, 2002; D. H. Lim, Morris, M. L., & Kupritz, V. W., 2006; Selim, 2010; Sun, Tsai, Finger, Chen, & Yeh, 2008).

Concerning knowledge usability, this research defined “knowledge usability” in two categories: the e-learning ease of use and the perceived usefulness of knowledge gained by e-learning systems. The ease of use is a main factor that many studies have talked about indicating that it could be a critical success factor for e-learning systems. (Selim, 2007; Wischmeyer, 2004)

The ease of use does not contradict with the participants’ recommendation of the necessity of pre-teaching training programmes to teach them how to interact with e-learning systems. These training programmes represent some sort of “training the learners how to learn with e-learning”, which enable learners to master the tools of e-learning and enable them to independently search for the knowledge they have been seeking.

In relation to the functionality of the knowledge gained from the e-learning system as the second side of my definition to the usability. Some of the participants indicated that it could be beneficent for them in their future education and work. “[H]igher education must adequately prepare students for real-world hobs.” (CAUDIT (Council of Australian University Directors of Information Technology), 2010: p. 18)

Strangely, other participated learners indicated their uncertainty regarding the possibility of using e-learning in the future. This uncertainty state of mind could be a result of the learners’ doubt regarding their future and whether they will work as teachers or in a private work?! Or it could be a result of the Egyptian educational system, which did not reinforce the independent personality in the learners. In addition, it could be because they are still learners and they do not want to say that what they have learned are useless, or because they did not think about this before, they simply think about finishing their learning without giving much thought about where and when they will use these information and knowledge, which will need further research to help guiding Egyptian learners to the best routes to benefit from the knowledge they gain from the educational system.

Concerning the efficacy of e-learning on the achievement levels of the Egyptian higher education learners, participants have shown great appreciation to the impact of e-learning system on their achievement. The participants’ views have cumulated to
support that their knowledge achievement level has increased by using the e-learning system. Additionally, their motivation to learn has increased by learning with e-learning system. This raise in the achievement level differs in the degree and strength from learner to the other but the majority of them agreed that their achievement level has increased in a certain degree by using the e-learning system and that have been reinforced by the achievement test results analysis and by many research indicated that the achievement levels of the e-learners have increased by using e-learning as a delivery method (Health Libraries Group, 2005; D. H. Lim, Morris, M. L., & Kupritz, V. W., 2006).

The previous answer of the third research question reinforces the importance of e-learning in: developing Egyptian higher education learners' knowledge and improve their achievement levels, bringing more in-depth understanding for how effectively e-learners will use the knowledge they have learned, giving more profound suggestions on how to implement successful e-learning systems inside the Egyptian higher education using the suggested critical success factors, demonstrating the satisfaction of e-learners with e-learning systems as a delivery method to the Egyptian higher education curriculum, which could accelerate the appearance of new generations of Egyptian learners that possess the abilities to interact effectively with e-learning affordances to help Egypt to become in between the advanced world.
The answer of Research Question 4

The answer of the forth research question: “What is the effectiveness of the suggested e-learning approach on students’ achievement level in the computer-maintenance curriculum?” demands the assessment of e-learners’ achievement levels on the taught units in the computer-maintenance curriculum using “pre-post achievement test”. And then use t-test to measure the means of the research sample different (significant). The results of using t-test is demonstrated in table (11)

From the results in table (11) it is obvious that the value of (t) is significant on a significant level (0.001), which indicate that there is a significant difference between the means of the research group’s degrees on pre and post-test for the sack of the post test, which indicates that there is an improvement happened in the learners’ achievement levels on the achievement test after learning with the implemented e-learning system. This is supported by many research in the literature (Health Libraries Group, 2005; D. H. Lim, Morris, M. L., & Kupritz, V. W., 2006; New Zealand Council for Educational Research, 2004).

Thus, the research anticipates that the developments in the learners’ achievement levels could be due to the next reasons:

- Using the VLE as a solely learning delivery method for their curricula, which reinforces the learners’ views that e-learning have a positive effectiveness on enhancing their knowledge.
- The usage of both personalised and collaborative activities inside the VLE have increased learners’ motivations to learn.
- The availability of many resources enabled the learners to reinforce their learning with different methods and helped to decrease the differences in learning abilities and learning styles.
- The novelty of e-learning to the Egyptian higher education learners helped them to incorporate e-learning as a delivery method although they suffer from the lack of available time to practice any innovative learning delivery method (Clark, 2001).
- The abilities of the Egyptian higher education learners to embrace new innovations and effectively use them in their learning.
- The fast feedback to the learners over the VLE represented a good reinforcement for the learners.
The answer of Research Question 5

The answer of the fifth research question: “What is the effectiveness of computer-maintenance e-learning system on learners’ satisfaction toward e-learning as a delivery method?” a range of data collection methods were used to answer this question including Questionnaire, Interviews, Focus groups.

In order to satisfy learners during online learning, several instructional strategies are suggested including: providing immediate feedback on learners’ questions and timely technical support (D. H. Lim, Morris, M. L., & Kupritz, V. W., 2006). While, seven variables are suggested by Sun et al. (2008: p. 1193) to have critical relationships with e-Learner satisfaction such as learner computer anxiety, instructor attitude toward e-Learning, e-Learning course flexibility, course quality, perceived usefulness, perceived ease of use, and diversity in assessment.

In this research it is clear that the participants’ ability to know the challenges as well as the advantages of e-learning and their positive attitude toward e-learning represent real indicators for their satisfaction with the implemented “computer-maintenance VLE”.

There is another important indicator of both (tutors and learners) satisfaction; it is their satisfaction with the interaction facilities inside the e-learning system. Why it is an important part of their satisfaction? The simple answer would be because it is one of the basic components of guaranteeing the learners’ satisfaction with any educational delivery method; meaning without the interaction there will be no communication, which leads to lost of the message tutors struggle to convey to their learners.

The important of stakeholders’ satisfaction with the interaction facilities inside e-learning systems are more important to guarantee stakeholders’ overall satisfaction with e-learning. Because of the separating distances and times between tutors and their learners in e-learning, good and efficient interaction facilities are more likely to represent a live-saver for the learning processes inside e-learning. On the contrary, in paper-based learning; tutors usually face learners, which make the interaction more naturalistic.

Learners’ acknowledgement of the interaction facilities inside the implemented e-learning system (with its three types of interactions) and their positive attitudes toward the implemented e-learning system enable to predict that learners are satisfied with the interaction facilities inside the implemented e-learning system (VLE).

From the previous discussion of the views of the participants, conditions of ensuring learners’ satisfaction are established; these are the recognition of both the advantages and disadvantages of e-learning and its interactive facilities in addition to their positive attitudes toward the use of e-learning as a delivery method. This is reinforced by many
research in the literature that support the abilities of e-learning to enhance the e-learners’ satisfaction with the courses they undertook using e-learning systems (CAUDIT, 2010; Clark, 2001; Health Libraries Group, 2005; New Zealand Council for Educational Research, 2004; H. M. Selim, 2010; P. C. Sun, Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D., 2008)
Chapter 6 ‘Conclusions, Implications, and Recommendations’

The purpose of this Case Study research was to determine the efficacy of e-learning systems for the Egyptian higher education in order to present practical recommendations to establish and evaluate quality in e-learning systems. As a result of literature reviews, academic discussion (presentations), and the empirical evidences of analysis, a model for implementing and evaluating quality in e-learning systems can be presented. Additionally, the implications of this model and the research limitations will be discussed. Finally, recommendations for future research will be proposed.

Conclusions

The research demonstrates the journey of implementing e-learning into the Egyptian higher education context. This expedition to the uncontaminated land of using e-learning can shed light on the whole processes of implementing new delivery methods like e-learning into new learning environments.

E-learning: Expectations and possibilities.

The beginning of the journey is to approach the soil; where the new delivery method is going to be implemented, that is the Egyptian higher education learning environment. To know the prospective Egyptian e-learners’ expectations from the new delivery method and the specifications of the available Egyptian higher education learning environment and what benefits could occur to this learning environment by using e-learning systems.

The analysis of the gathered data has shown that the Egyptian higher education e-learners (as the main element in the educational environment) have a variation in perspective regarding e-learning as a delivery method. The participants’ expectations to benefit from e-learning systems in their learning vary between positive, negative, and neutral expectations. The same variety in the soil’s elements itself, some soils are ready to be planted while others will vary upon the nature of the soil and the level of care that been given to it. Similarly, in the implementation of e-learning in new learning environment like Egyptian higher education context; some learners will be ready to adapt with the new delivery method. While, others will not be in the same level of adaptability according to their abilities, the support they will get during learning by e-learning, and their previous experiences with similar delivery methods.

It is important to know what the specifications of the soil you are going to plant before getting involved with the implementation processes. Accordingly, it is necessary to know the affordances of your soil in order to know what you can offer to successfully
plant this soil. Correspondingly, it was important to know the specifications of the Egyptian higher education context before getting involved with the implementing of e-learning inside the new learning environment in order to know what kind of support and possibilities should be presented to the new delivery learning environment.

The analysis of the data clearly shows that the available technological structure for the Egyptian higher education has some advantages and challenges for the implementation of e-learning systems. The most significant challenges are the absence of appropriate high-speed Internet connection, the official lecturer’s book for each curriculum represented the available learning resources inside the Egyptian higher education learning environment; which represented an inhibitor in front of the Egyptian higher education learners to diversify their knowledge and obtain different perspectives regarding the topic they are going to learn about. Additionally, there are other problems that represent the human inabilities to cope efficiently with e-learning affordances such as (the rare experiences of using the Internet, the Internet usage inexperience among some tutors, the tendency to work in a personalised learning environment).

On the other hand, Egyptian higher education learners have many advantages, which could help reinforcing the successful opportunities for implementing e-learning into higher education sector such as: many learners have their own PCs; some of them could have the basic required skills; and the sincere desire to learn by e-learning.

As a respond to these challenges in the learning environment infrastructure inside the Egyptian higher education context, e-learning could offer a lot of possibilities that varied in its diversity and inclusion. For example, the abilities of e-learning resources, activities to fulfil learners’ different needs in addition to the availability all the times are considered some of the main possibilities that e-learning could afford to e-learners.

**E-learning implementation challenges.**

It is important to acknowledge the challenges you are going to face during planting your land in order to prepare yourself with all the possible defences to be able to successfully overcome these challenges. Equally, in implementing e-learning inside the Egyptian higher education context, it was important to recognise the possible challenges in order to be ready to conquer these challenges.

The participants clearly demonstrate number of challenges that face their integration with e-learning systems. These challenges are:

- They do not have enough time to participate in e-learning because all their time is consumed in the attendance requirements in the Faculty and in transportation from their homes to the Faculty and vice versa.
• Egypt suffers from the insufficient prerequisite skills among the higher education learners. There is inefficiency of learners’ skills to interact with the Internet, the insufficient English language levels among the Egyptian higher education learners, the tendency for them to personalising the learning environments and neglecting collaboration work, insufficient numbers of skilful and understanding tutors to lead the alteration of the learning delivery method into e-learning.

• Egypt suffers from the insufficient financial and technological affordances such as the lack of PCs and the unavailability of high speed Internet connections, beside the defective computer supply in the educational institutions.

• The participants indicated that e-learning designers have many challenges to think about such as: the VLE construction including whether to open the VLE to the Internet world, the type of activities and resources to be included in the VLE, and the used assessment method; the interface appearance, which demands careful attention to all details of the interface design such as: font size, colours, pictures, and animations.

• Participants explained that administrators face many challenges in implementing e-learning as a new delivery method like learners’ preferences to face their tutor while learning, the necessity of new assessment tools that are capable to deal effectively with the nature of e-learning systems, the communication with course tutor, the necessity of involving all the stakeholders in implementing new e-learning systems, the ability and flexibility of the Egyptian administrative inner system to host as many learning delivery methods as possible.

• It is apparent that there is a mutual lack of trust problem in the relationship between the learners and the Egyptian higher education authorities with all its levels (the educational institutions’ authorities + the ministry of higher education authority). This lack of trust among the learners has been reflected on the whole process of learning whether during the learning process itself; in the way the learners’ attitude towards the curriculum they are undertaking, or at the end of the learning processes; in the way the learners’ satisfy with the curriculum they have learned and whether they think they are going to benefit from them in their future life or not.

It is an enlightening stage to know what kind of challenges that is going to face your implementation of new e-learning system prior to getting involved with the implementation process. In this way you could prepare yourself for facing these challenges and proceed to implement a successful e-learning system.
E-Learning Implementation Outcomes.

As any farmer, who knows the potentials of his soil, identifies the challenges that he is going to face, spread his seeds. He has to harvest his crops and how to guarantee the quality of his crops in the next harvests. Equally, E-learning implementation has to give fruitful outcomes that could appear on the e-learners and more importantly has to establish the criteria for addressing quality in the next e-learning system to be implemented.

The participants explained that the implementation of e-learning inside the Egyptian higher education sector has generated group of important outcomes including: generating group of factors that represent critical success factors for implementing e-learning inside the Egyptian higher education context including the nature of the curriculum content (theoretical, pragmatic); Tutor characteristics (attitude towards e-learning, proficiency of the technology, and support); learners’ characteristics (computer competency, English language proficiency, and learning style); and technology (usability, affordances and infrastructure).

In this research it is clear that the participants’ ability to know the challenges as well as the advantages of e-learning in addition to their positive attitudes toward e-learning, which represent from the research’s definition to the term “satisfaction” genuine indicators for their satisfaction with the implemented “computer-maintenance VLE” including their satisfaction with the interaction facilities inside the e-learning system.

This research has used four methods to collect data regarding the efficacy of e-learning on the e-learners’ achievement levels (Focus groups, Interviews, Achievement test, and Questionnaire). The data gathered from these methods have accumulated to support the positive impact of e-learning systems in improving the achievement levels among the Egyptian higher education e-learners.

This research defined “knowledge usability” in two categories: the e-learning ease of use and the perceived usefulness of knowledge gained by e-learning systems. Concerning the first part of the definition that is “the ease of use”, the participants identified the necessity of pre-teaching training programmes for the e-learners to teach them how to interact effectively with e-learning systems. Regarding the second part of the definition that is “the functionality of the knowledge gained from the e-learning system”, there was an uncertainty state of mind regarding the possibilities of using e-learning in their future work, which could be a result of the learners’ doubt regarding their future; Or it could be a result of the Egyptian educational system, which did not reinforce the independent personality in the learners, which made them simply think about finishing their learning without giving much thought about where and when they will use these information and knowledge.
**Recommendations for Successful E-learning Implementation.**

As a farmer you enriched your knowledge regarding the best crop growing from the experiences you get year by year. Likewise, educators improve their knowledge regarding the best ways to implement e-learning systems from the real implementation experiences that take place every minute in the world right now.

As a result of implementing “Computer-Maintenance VLE” inside the Egyptian higher education context, the participants have generated a group of elements that they saw very important to be addressed if successful implementation of e-learning systems is required. These recommendations are divided into three categories including recommendations for the learners, recommendations for the designers, and recommendations for the administrators.

The recommendations for the e-learners are changing learners’ way of thinking about e-learning systems from a waste of time or leisure activities into a useful delivery method for Egyptian higher education curriculum to guarantee learners’ adoption of e-learning systems, developing the learners’ computer & Internet literacy to master the necessary skills to interact effectively with e-learning systems, improving the levels of English language among the higher education learners, the necessity of training courses on how to interact effectively with e-learning before beginning learning with e-learning.

The participants have proposed recommendations to the e-learning designers including the construction of the e-learning system, and the characteristics of e-learning tutors. The constructions of e-learning system recommendations include (from the participants’ point of views) the interface design, the type of activities to be included inside e-learning systems, and the necessity of the periodical assessment for learners’ development.

The participants explained that e-learning tutors need to obtain certain characteristics such as reasonably fast feedback, the academic proficiency of the tutor, Tutors’ ability to monitor and observe his/her learners, and tutors’ positive attitudes toward the curriculum s/he teaches.

The recommendations for e-learning administrators are the necessity of starting learning using e-learning systems in an early age; the importance of involving all the stakeholders in designing e-learning curriculum; the necessity of decreasing learners’ attendance requirements at faculties to enable them to learn freely by e-learning systems; the necessity of training tutors how to effectively engage with the e-learners; changing the officials’ minds regarding using modern technologies in education; and finally, the necessity of enhancing the technologies infrastructure to fit with e-learning demands.
The fruitful outcomes of implementing e-learning inside the Egyptian higher education

It was important to implement a VLE inside the Egyptian higher education context to enable the participated learners to get the feeling of the usage of VLE in learning because as mentioned before this is a relatively new experience for the Egyptian higher education learners and in order to get a truthful opinions from them, they have to know what they are talking about. Thus, it was essential to implement such e-learning system to get learners’ feedback, which is based upon a true experience with e-learning.

The main purposes were to investigate the efficacy of e-learning for the Egyptian higher education context in addition to present practical recommendations to enhance the suggested model of establishing quality in e-learning systems.

Regarding the first purpose, e-learning have proven its effectiveness in improving the achievement levels amongst the Egyptian higher education learners in addition to its efficacy in providing e-learners with a satisfactory learning delivery method, which helped to increase the positive attitudes toward e-learning as a learning delivery method.

Concerning the second purpose of this research, the findings have guided the researcher to add new factor to the “evaluation during development”, which is “critical success factors”. This addition to the factors that needs to be taken care of during the developmental processes of implementing new e-learning systems have made these evaluation processes including three main factors (e-learning standards, e-learning quality, critical success factors).

In addition to this addition of “critical success factors”, the participants have indicated that the “e-learning environment” factor needs to address the following points: Collaboration Activities; Facilities to Access and Interact; Resources; Assessment Tools; Personalised Activities. From the participants’ views, these five factors construct the e-learning environment, which make addressing each one of these factors essential to guarantee the quality of the implemented e-learning system.
Limitations of the research

Although this research represents a careful and continuous effort to incorporate elements of e-learning, established current background by searching the literature, fairly to obtain the participants’ views, analysing the data, and reflecting on the results. It is not without limitations. First, the research was conducted at one educational institution, but this institution is a representative of all other similar institutions in the Egyptian higher education sector (the faculty of specific education-Tanta University is one of 18 similar faculties all over Egypt. They follow the Ministry of High Education and they all teach the same computer-maintenance curricula. Thus it could be argued that if the designed quality e-learning system proves its efficacy to Tanta University learners, it will be the same at the other 18 faculties around Egypt). Second, the research proposes a model covering a variety of factors influencing the quality in e-learning systems; it might not be comprehensive enough due to the limitations of time and resources but the range of discussion and presentations represented positive support for its efficacy (Abd El-Gawad, 2009; T. S. Abd El-Gawad, & Woollard, J., 2010; T. S. AbdEl-Gawad, 2010). Third, this work focuses on metrics from a specific e-learning system; the variance of different systems is not further investigated, although it is argued that the range of activities, resources inside the implemented e-learning system is rich enough to cover the variation which could exist in other systems.

Implications of the research

This research was an exciting and rewarding experience for the researcher who learned new lessons with every step along the journey of completing this work. The choice of case study as a research method proves accurate and proper for this research, which developed successfully a model to establish and evaluate quality inside e-learning systems in addition to showing the efficacy of e-learning systems to enhance the Egyptian higher education sector.

The Egyptian higher education sector is distinguished by the respected researchers’ abilities to individually collaborate with new criteria of research, which could be benefited from by using such brilliant researchers to develop the strategic and practical procedures that will lead the change processes into the massive usage of e-learning systems inside the Egyptian higher education.

Drawing from the findings, e-learning will have the implications in the following areas:

- **Policy**

  This section is concentrating on the procedures and rules that need to be addressed in order to obtain successful e-learning systems in the Egyptian higher education sector. Such as: the necessity of strategic plan regarding how to best benefit from using e-learning and how to collaborate with credited institutions
National accreditation of e-learners’ progress and the official recognition of the degree obtained by using e-learning system as a delivery method is needed to support the feasibility of using e-learning on a wider scale inside the Egyptian higher education. Thus, the requirement of creating a more profound accreditation programme for the used e-learning systems in the Egyptian higher education is becoming more essential.

• The Role of the Ministry of Higher Education

The Egyptian Ministry of Higher Education should concentrate on providing skills training in support of e-learning. For tutors: there should be CPD programmes available for them on how to engage with e-learners, e-learning courses design, IT literacy before, during, and after their teaching using e-learning systems. For learners: there should be prerequisite courses about how to interact effectively inside e-learning systems, IT literacy, improving the levels of English language before involving in learning with e-learning systems.

For e-learning systems to become a tool of changing the Egyptian higher education learners’ curriculum method of delivery, these e-learning systems should accommodate the participants’ critical success factors in order to implement successful e-learning systems.

Support for Learners is important (both technical and instructional support) to guarantee the learners’ satisfaction. Easy access to a reliable technology is essential in implementing quality inside e-learning systems.

• The Learners’ Experience

Offering the learners the freedom to learn however, whenever, and wherever they wish to learn is the most powerful advantage that could improve the learners’ experiences with e-learning systems.

Recommendations for future research

The findings of this research led to further research recommendations worthy of pursuing. For example,

• This research suggested a theoretical model to establish and evaluate quality inside e-learning systems. Therefore, the need for conducting research to generate more practical procedures and benchmarks for the establishment of quality inside e-learning systems is demanding.
The participants in this research have positive expectations for learning using e-learning systems, but the elements that influence these expectations are not quite clear. Thus, further research is needed to clarify this criterion.

More research is needed to identify realistic point of view or strategic programme for the Egyptian higher education and how to best benefit from e-learning in this strategy.

The assessment process in e-learning needs research to identify the best assessment strategies to assess learners’ improvement in knowledge, skills, and understanding. In addition to trying to change the higher education authority’s perspective toward assessment to perceive it as a complement of the learning process.

If e-learning systems are required to be successful inside the Egyptian higher education sector, research needs to be conducted on how to overcome the learners’ familiarity with face to face learning.

One can see from (table 10) that almost 78% of the participated learners believed that e-learning can assist them in improving their skills (performances) in the course they have undertaken. On the contrary, only 7.4% of the learners disagreed that e-learning system assisted them in improving their skills. Surprisingly, 14.8% of the learners said they “do not know” whether e-learning can assist them in improving their skills. Learners’ point of view regarding the efficacy of e-learning in improving their (performance) skills was not inclusive as in the knowledge part, which could emphasis, that e-learning need more attention when addressing improving skills issue. This research was not concentrated on the efficacy of e-learning in improving learners’ skills, which could represent a very good idea to future research.

These research topics will establish the basics of my future research. They will help in bringing more profound understanding to the e-learning criterion. This research of quality in e-learning systems has opened my mind to the potential of many factors that interfere with the implementation of quality inside e-learning systems.
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Appendices

- Appendix 1: Data Collection Tools in Arabic and English
- Appendix 2: Ethical papers
- Appendix 3: piloting the Collecting Methods
- Appendix 4: Experts’ Names and Contributions
- Appendix 5: Quantitative Data Analysis
- Appendix 6: Computer-maintenance VLE
- Appendix 7 Poster
Appendix 1 Data Collection Tools in Arabic and English

The quality e-learning systems Questionnaire First Part (in English)

<table>
<thead>
<tr>
<th>Items</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Don’t Know</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</thead>
<tbody>
<tr>
<td>Please enter one tick for your appropriate answer.</td>
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<tr>
<td><strong>Learning Environment:</strong></td>
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<tr>
<td>I am satisfied with using e-learning as a method of delivery</td>
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<td>I am satisfied with using e-learning content</td>
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<tr>
<td>I am satisfied with using e-learning collaboration activities</td>
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<tr>
<td>I believe e-learning can assist teacher-learner interaction</td>
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<tr>
<td>I believe e-learning can assist learner-learner interaction</td>
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<tr>
<td>I am satisfied with using e-learning personalised activities</td>
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<td>I believe e-learning can assist me to concentrate on my learning</td>
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<td>I am satisfied with using e-learning assessment</td>
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<td>I am satisfied with e-learning functions</td>
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<tr>
<td>I believe using e-learning will improve my learning</td>
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<tr>
<td>I am satisfied with the learning reinforcement inside the e-learning</td>
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</table>
### Evaluation during development:

<table>
<thead>
<tr>
<th>I believe that the colour of the background was suitable</th>
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<tbody>
<tr>
<td>I believe that the colours of fonts were suitable for my eyes</td>
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<tr>
<td>I believe that the font size was suitable to read</td>
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<tr>
<td>I believe that the organisation of the content was good</td>
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</table>

### Learning Outcomes:

<table>
<thead>
<tr>
<th>I believe e-learning can assist improving the student’s knowledge</th>
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<tbody>
<tr>
<td>I believe e-learning can assist improving the student’s skills (performance)</td>
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<tr>
<td>I believe e-learning can improve learning motivations</td>
</tr>
<tr>
<td>I believe e-learning can assist improving the student’s understanding</td>
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<tr>
<td>I intend to use e-learning to assist my learning in the future</td>
</tr>
<tr>
<td>I intend to use e-learning content to assist my learning in the future</td>
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<tr>
<td>I intend to use e-learning activities to assist my learning in the future</td>
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<tr>
<td>I believe e-learning content is informative</td>
</tr>
<tr>
<td>I believe e-learning content is useful</td>
</tr>
<tr>
<td>I believe e-learning is a useful method of curriculum delivery</td>
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<tr>
<td>I believe I can use the knowledge I gained effectively in my work</td>
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</tbody>
</table>
### Stakeholders’ Satisfaction:

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<tbody>
<tr>
<td>The VLE met my expectations</td>
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<tr>
<td>The e-learning system was effective</td>
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<tr>
<td>The e-learning system is necessary for teaching the curricula</td>
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<tr>
<td>I feel confident using e-learning systems</td>
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<tr>
<td>I feel confident using e-learning content</td>
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<td></td>
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<tr>
<td>I feel confident using e-learning activities</td>
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<tr>
<td>I feel confident using e-learning assessment</td>
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</tbody>
</table>

The quality e-learning systems Questionnaire Second Part (in English)

Which learning style do you prefer?

1. Online.
2. Traditional Paper Based.
3. Both.

When undertaking online course, how would you rate your satisfaction with the online courses?

2. Satisfied.
3. Don’t Know.
4. Unsatisfied.
5. Very Unsatisfied.
Did the course (undertaken one) provide appropriate collaboration activities for you?

1. Yes.
2. No.

Please comment: ..............................................................
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Have you received sufficient guidance on how to succeed on your course?

1. Yes.
2. No.

Please comment: ..............................................................
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Have you had sufficient opportunities to give your point of view?

1. Yes.
2. No.

If no, Why not ..............................................................
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Was the content of your course suitable for online education?

1. Yes.
2. No.
Please comment: ............................................................
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What did you expect to learn from the online course?
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Did you achieve what you expected to learn?
  1. Yes.
  2. No.
Please comment: ............................................................
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Will the course help you in your job? (If applicable)
  1. Yes.
  2. No.
  3. Don't Know.
Please comment: ............................................................
In undertaking the course how would you rate your experience?
1. Positive experience.
2. Negative experience.

Please comment: .................................................................
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Did the course provide lecture/student interactions?
1. Yes.
2. No.

Please comment: .................................................................
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Did the course provide student/student interactions?
1. Yes.
2. No.

Please comment: .................................................................
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Did the course provide networked learning (forums, discussions, chat)?
   1. Yes.
   2. No.
Please comment: .................................................................
                           .................................................................
                           .................................................................
                           .................................................................
If you had a choice of the methods you delivered your course with which method would you prefer?
   1. Paper-Based.
   2. Online.
Please explain why: .................................................................
                           .................................................................
                           .................................................................
                           .................................................................
### The quality e-learning systems Questionnaire First Part (in Arabic)

<table>
<thead>
<tr>
<th>العنصر</th>
<th>أُافق بشدة</th>
<th>أُافق</th>
<th>لا أُافق</th>
<th>لا أُافق بشدة</th>
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</thead>
<tbody>
<tr>
<td>تسهيلات بيئة التعلم</td>
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<tr>
<td>راضي عن استخدام التعلم الإلكتروني كطريقة لتسليم المقررات</td>
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<tr>
<td>راضي عن استخدام محتوى التعلم الإلكتروني</td>
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<tr>
<td>راضي عن استخدام أنشطة التعلم التعاوني في نظام التعلم الإلكتروني</td>
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<tr>
<td>اعتقد أن التعلم الإلكتروني يمكن أن يساعد على التفاعل بين المدرس والمتعلم</td>
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<tr>
<td>اعتقد أن التعلم الإلكتروني يمكن أن يساعد على التفاعل بين المعلمين</td>
<td></td>
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<tr>
<td>راضي عن استخدام الأنشطة الفردية في نظام التعلم الإلكتروني</td>
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<tr>
<td>اعتقد أن التعلم الإلكتروني يمكن أن يساعدني على التركيز في تعلمي</td>
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<tr>
<td>راضي عن استخدام نظام التعلم الإلكتروني في التقييم</td>
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<tr>
<td>راضي عن التعلم باستخدام نظام التعلم الإلكتروني</td>
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<tr>
<td>اعتقد أن استخدام التعلم الإلكتروني سيحسن تعليمي</td>
<td></td>
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<tr>
<td>راضي عن الدعم الموجود في نظام التعلم الإلكتروني</td>
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</tbody>
</table>

التقييم خلال التطوير:

اعتقل أن لون الخلفية مناسب

اعتقل أن لون الكلام كان مناسب للعين
<table>
<thead>
<tr>
<th>مخرجات التعلم</th>
<th>مخرجات التعلم</th>
<th>مخرجات التعلم</th>
</tr>
</thead>
<tbody>
<tr>
<td>اعتقد أن التعلم الإلكتروني يمكن أن يساعد على تحسين معلومات التعلم.</td>
<td>اعتقد أن التعلم الإلكتروني يمكن أن يساعد على تحسين مهارات (إداة) التعلم.</td>
<td>اعتقد أن التعلم الإلكتروني يمكن أن يزيد دافعة التعلم.</td>
</tr>
<tr>
<td>اتخاذ استخدام التعلم الإلكتروني كمساعد في التعلم مستقبلاً.</td>
<td>اتخاذ استخدام محتوى التعلم الإلكتروني لمساعداتي في التعلم مستقبلاً.</td>
<td>اتخاذ استخدام محتوى التعلم الإلكتروني لمساعداتي في التعلم مستقبلاً.</td>
</tr>
<tr>
<td>اعتقد أن التعلم الإلكتروني يسهل وصول المعلومات للمستخدم.</td>
<td>اعتقد أن محتوى التعلم الإلكتروني مفيد.</td>
<td>اعتقد أن التعلم الإلكتروني طريقة مفيدة لتدريس المناهج.</td>
</tr>
<tr>
<td>اعتقد أنني أستطيع استخدام المعلومات التي اكتسبها فاعلية في عملية المستقبلي.</td>
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</table>

**رضا المشاركين**

- نظام التعلم الإلكتروني الذي درست بواسطةه حقق توقعاتي.
- نظام التعلم الإلكتروني الذي درست بواسطةه كان فعالاً.
- نظام التعلم الإلكتروني ضروري لتدريب المقرر.
The quality e-learning systems Questionnaire Second Part (in Arabic)

| 1. التعلم الإلكتروني |
| 2. التعلم التقليدي (الورقي) |
| 3. كلاهما |
| 4. ليست متأكدة |

| 1. مرضي جدا |
| 2. مرضي |
| 3. لا أعرف |
| 4. غير مرضي |
| 5. غير مرضي جدا |

هل وفر لك نظام التعليم الإلكتروني (الذي درست بواسطته) أنشطة تعاونية ملائمة لك؟

| 1. نعم |
| 2. لا |
من فضلك اطلب تعليقك:

هل تلقىتك توجيه كافٍ عن كيفية النجاح في المنهج الذي تدرسه بالتعلم الإلكتروني؟
1. نعم.
2. لا.
من فضلك اطلب تعليقك:
هل وجدت فرص كافية لتوضيح وجهة نظرك؟

1. نعم.
2. لا.

لو كانت الإجابة ب لا فما هي الاسباب من وجهة نظرك:

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هل كان محتوى النهج الذي درسته مناسب للتعليم بنظام التعلم الالكتروني؟

1. نعم.
2. لا.

من فضلك اعطنا تعليقك:

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Data Collection Tools

Appendix 1

ما الذي توقعت أن تتعلم من التعلم الإلكتروني؟

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هل حققت ما توقعت أن تتعلم؟

1. نعم.
2. لا.

من فضلك اطلعنا تعليقك:

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177
هل سيساعدك التعليم الإلكتروني في وظيفتك المستقبلية؟
1. نعم.
2. لا.
3. لا أعرف.
من فضلك اعطنا تعليقك:
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من خلال دراستك لمنهج نظام التعليم الإلكتروني، كيف تقيم تجربتك؟
1. تجربة إيجابية.
2. تجربة سلبية.
من فضلك إعطنا تعليقك:
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هل وفر نظام التعليم الإلكتروني التفاعل بين المعلم والتعلم؟
1. نعم.
2. لا.
من فضلك اعطنا تعليقك:

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هل وفر نظام التعليم الإلكتروني نظام التعلم الجماعي على الشبكة (المنتديات، المحادثة، الويكي)؟

1. نعم
2. لا

من فضلك أعطنا تعليقك موضحاً أي هذه الأنشطة مفضلة لديك ولماذا:

________________________________________________________________________________________

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________________________________________________________________________________________

لو لديك فرصة اختيار الطريقة التي ستتعلم بها منهجك، أي طريقة ستفضل؟

1. الطريقة الورقية العادية.
2. التعلم الإلكتروني.

من فضلك وضح الأسباب:

________________________________________________________________________________________

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Appendix 1  Data Collection Tools

شكرا لمساهمتك،
تامر سمير عبد البديع عبد الجواد
The Interview questions

The Interviews on the next page will be used to gain feedback on the e-learning system in one main aspect: Quality of e-learning and four sub aspect; Stakeholders Satisfaction, Learning outcomes, Evaluation during Development, Environment Facilities.

The main focus for these interviews is to reach initial information about the efficacy of e-learning systems to the Egyptian higher education; I have a list of topics that I would like to discuss over the next 20 minutes. Your comments will be strictly confidential in that they will not be associated with you or your faculty/college.
Appendix 1  Data Collection Tools

Students Schedule:
S.1. what expectations did you have of e-learning systems before participating in the computer-maintenance course?
S.1.1. Did you find what you were expecting in the VLE?
S.1.2. Can you identify an event or incident during the e-learning course that led you to change your opinions or expectations of e-learning systems?
S.1.3. How would you evaluate your experience with the VLE?
S.1.4. Why did you find it good...?
S.1.5. Did you expect to face a lot of difficulties in learning with e-learning systems?
S.1.6. Why did you expect so?
S.1.7. And did you find any difficulties in learning using VLEs after studying the computer-maintenance course?
S.1.7.1. what was difficult in dealing with the VLE?
S.1.8. Would you like to take another course using VLEs? Why?
S.1.9. How do you rate your experience with learning using VLEs?
S.1.10. Were there any surprise resulting from using VLEs?
S.1.11. Was the system easy to use regarding the required technological skills?
S.1.12. How would you rate your internet self-efficacy?

Instructors Schedule:
S.2. What thoughts did you have about how and when to use e-learning systems?
S.2.1 Did you see any barriers to implement your philosophy of teaching and your curricula in a VLE? If yes what are these barriers?
S.2.2. What did you find difficult using VLEs?
S.2.3. Do you think e-learning is different from FTF? Why?
S.2.4. Do you think e-learning will change the roles and responsibilities of the teacher and the learners? If yes, in what way?
S.2.5. Do you think e-learning will enable learners to replace the teacher's roles?
S.2.6. What is your definition of motivation? Do you belief that e-learning will increase student's motivation?
S.2.7. How would you rate the activities in the VLE?
S.2.8. How would you assess your satisfaction with the computer-maintenance VLE?
S.2.9. Was the VLE compatible with different kind of browsers you have used?


Educational Institutions Schedule:

S.3. What did you expect your institution will gain from the e-learning system?

S.3.1. What was your point of view about e-learning systems?

S.3.2. In what way did this VLE change your views about e-learning?

S.3.3. Will you encourage your institution’s researchers to conduct research searching the benefits of e-learning?

S.3.4. How do you see your institution could benefit from e-learning systems?

S.3.5. What are the possibilities of using VLEs in teaching in your institution?
Interview questions in Arabic

لاستماع المتعلم:
ما الذي كنت تتوقعه بالنسبة لنظام التعليم الإلكتروني قبل اشتراكك في نظام التعليم الإلكتروني لمنهج صيانة أجهزة الحاسوب؟
وهل وجدت ما كنت تتوقعه في نظام التعليم الإلكتروني لمنهج صيانة أجهزة الحاسوب بواسطة (بيئة التعلم التخليدية)؟
هل يمكنك أن تخبري بحادثة أو واقعة حدثت خلال تعلمك من خلال التعليم الإلكتروني قادتك لتشييع رأيك أو توقعاتك لنظام التعليم الإلكتروني؟
كيف تقيم تجربتك في استخدام نظام التعليم الإلكتروني؟
لماذا واجدت الدراسة بالتعلم الإلكتروني مرضاً؟
هل توقعت مواجهة صعوبات كثيرة في التعليم بواسطة التعليم الإلكتروني؟
وهل واجدت ذلك؟
وهل وجدت أي صعوبات في التعليم باستخدام بيئة التعلم التخليدية أثناء دراستك لمنهج صيانة أجهزة الحاسوب؟
ما الذي مثل صعوبة في التعامل معه أثناء دراستك بنظام التعليم الإلكتروني؟
هل تود أن تقوم بدراسة منهج آخر باستخدام بيئة التعلم التخليدية ولماذا؟
كيف تقيم تجربة تعلمك باستخدام بيئة التعلم التخليدية؟
هل حدثت أي منافع أثناء استخدام بيئة التعلم التخليدية؟
هل كانت المهارات التكنولوجية المتطلبة لاستخدام التعليم الإلكتروني بسيطة؟
كيف تقيم اعتمادك الذاتي على التعلم من خلال الإنترنت؟
لاستماع المعلم:
ما الافكار التي كانت تدينك عن وقت استخدام نظام التعليم الإلكتروني؟
هل وجدت أي معوقات تعوق تحويل فلسفةك في التدريس أو تحويل مناهجك إلى نظام تعلم الإلكتروني وما هي هذه المعوقات؟
ما الذي كان صعب الاستخدام في نظام التعليم الإلكتروني؟
هل تعتقد أن التعليم الإلكتروني يختلف عن التعليم العادي ولماذا؟
هل تعتقد أن التعليم الإلكتروني سيغير من أدوار ومسؤوليات المعلم والمتعلم؟ وهب أي طريقة؟
هل تعتقد أن التعليم الإلكتروني سيتمكن المتعلم من تبادل الأدوار مع المعلمين؟
ما هو تعريفك للدبلومي؟ وهو تعتقد أن التعليم الإلكتروني سيزيد من دافعية المتعلم؟
كيف تقيم الإنشطة في نظام التعليم الإلكتروني؟
كيف تقيم رضاك عن بيئة التعلم التحليدية الخاصة بمنهج صيانة أجهزة الحاسوب؟
هل كانت بيئة التعلم التحليدية ملائمة لمختلف أنواع المتصفحات التي تستخدمها؟
أنشطة المؤسسات التعليمية:
ما الذي توقعت أن يعاني مؤسستك التربوية من نظام التعليم الإلكتروني؟
كيف كانت وجهة نظرك لنظام التعليم الإلكتروني من قبل؟
هل تغيرت هذه الروية بعد استخدامك لبيئة التعليم التحليلية لتدريس منهج صيانة أجهزة الحاسبات؟
وبأي صورة تغيرت وجهة نظرك عن التعليم الإلكتروني؟
هل ستشجع الباحثين في مؤسستك التربوية كي يقوموا ببحث يتعلق بالاستفادة من مميزات التعليم الإلكتروني؟
ما هي الافكار التي كانت لديك عن كيفية استخدام التعليم الإلكتروني؟
هل تغيرت أي من هذه الافكار بعد استخدامك لبيئة التعليم التحليلية لتدريس منهج صيانة أجهزة الحاسبات؟
كيف ترى وجه الاستفادة لمؤسسات التربوية من نظام التعليم الإلكتروني؟
ما هي إحتمالات استخدام بيئة التعليم التحليلية كأحد أنماط التعليم الإلكتروني في التدريس بمؤسسات التربوية؟
Appendix 2 Ethical papers

CONSENT FORM

Study Title: Investigating the Efficacy of E-learning
Researcher name: Tamer Sameer AbdEl-Badea AbdEl-Gawad
Study reference:
Ethics reference:

Please initial the box(es) if you agree with the statement(s):

I have read the information sheet and had the opportunity to ask questions about the research. ☐

I understand that my contribution to the research will be anonymous and my name will not be associated with my contribution in any way. ☐

I understand that if I choose to contribute to the project be being interviewed my interview may be taped and transcribed. ☐

I understand that I will be shown any edited versions of my contributions before they are used. ☐

I understand that I have the right to withdraw my contribution if I don't like how you propose to use it. ☐

I consent to edited (but entirely anonymised) pieces of my contribution being used in investigating the efficacy of e-learning.

Signed………………………………………………..Date……………………………………

Name: …………………………………………………………………………………………………

The researcher: Tamer Sameer AbdEl-Badea AbdEl-Gawad

Researcher Signature: …………………………Date: ………………………………
Participant Information Sheet

Title: Investigating the Efficacy of E-learning
Researcher: Tamer Sameer AbdEl-Badea AbdEl-Gawad
Ethics number:

Please read this information carefully before deciding to take part in this research. If you are happy to participate you will be asked to sign a consent form.

This research aims to investigate the efficacy of e-learning systems for Egyptian higher Education and to use the outcomes to evaluate whether and how e-learning can accomplish high quality learning for the Egyptian higher education institutions. You have been chosen because you are a representative for the whole society of Egyptian higher education involved in e-learning. The whole investigation will take six weeks including conducting participants’ interviews, focus groups, and completion of questionnaires.

Taking part in this research may widen your horizons and could enhance your skills and knowledge in computer-maintenance without any mentioned risks at all. The project is committed to and will abide by the terms of the Data Protection Act. All the original un-edited and potentially identifiable contributions will be stored on a password protected computer. You will have the right to withdraw at any time without any legal rights upon you.

It would be great to have your completed contributions by the end of May, but if you feel you will need longer than this, Please notify me before the dead time announced in the e-learning system.

Still interested?
If you are still interested in taking part in this research, please complete the consent form attached, sign it and return it to me. I will sign it and send you a copy for your own personal records.

If you need to ask about any thing at any time, please don’t hesitate to contact me at: tamrabran@yahoo.com; tamer_r_r_a@hotmail.com

Thank you,

In case of concern/complaint contact:
Trudi Storey
Research Governance
Corporate Services
Building 37, Level 4, Room 4001
University of Southampton, Highfield Campus
Southampton, SO17 1BJ
tel: 023 8059 (2)5058
Appendix 3 Piloting the Collecting Methods

Information Sheet

Researcher: Tamer Sameer AbdEl-Badea AbdEl-Gawad

This research aims to investigate the efficacy of e-learning systems for Egyptian higher Education and to use the outcomes to evaluate whether and how e-learning can accomplish high quality learning for the Egyptian higher education institutions.

I will be very pleased if you decide to examine my data collection tools as an expert in education and your mother tongue is Arabic. The full investigation will take six weeks including conducting participants’ interviews, focus groups, and completion of questionnaires and surveys.

What I am asking from you is:

- Examine the questions to see if they fit with the main objective of the research which is mentioned above.
- Examine the translation from English to Arabic to make sure it is comprehensive and understandable.
- Of course, any other comments will be appreciated in the comment page at the end.

It would be great to have your completed contributions as soon as possible.

If you need to ask about anything at any time, please don’t hesitate to contact me at:

tamrabran@yahoo.com
	tamer_r_r_a@hotmail.com

Thank you,

- I am going to use the term VLE (Virtual Learning Environment) as a type of e-learning system.
- Consequently, I could use the two terms as equal (VLE, E-learning system).
This table will contain the questions I am going to use and its translation into Arabic. Please give your feedback about its clarity, suitability, translation.

Thank you,

Questionnaire regarding quality in e-learning systems:

<table>
<thead>
<tr>
<th>Questions in English (First Part)</th>
<th>Questions in Arabic (First Part)</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please enter one tick for your appropriate answer.</td>
<td>من فضلك ضع علامة (✓) للاجابة الملائمة لك</td>
<td></td>
</tr>
<tr>
<td><strong>Environment Facilities:</strong></td>
<td>تسهيلات بيئة التعليم</td>
<td></td>
</tr>
<tr>
<td>I am satisfied with using e-learning as a method of delivery</td>
<td>راضي عن استخدام التعلم الإلكتروني كطريقة تلميذ المقررات</td>
<td></td>
</tr>
<tr>
<td>I am satisfied with using e-learning content</td>
<td>راضي عن استخدام محتوى التعلم الإلكتروني</td>
<td></td>
</tr>
<tr>
<td>I am satisfied with using e-learning collaboration activities</td>
<td>راضي عن استخدام انشطة التعلم التفاعلية في نظام التعلم الإلكتروني</td>
<td></td>
</tr>
<tr>
<td>I believe e-learning can assist teacher-learner interaction</td>
<td>اعتقد ان التعلم الإلكتروني يمكن ان يساعد على التفاعل بين المدرس والتعلّم</td>
<td></td>
</tr>
<tr>
<td>I believe e-learning can assist learner-learner interaction</td>
<td>اعتقد ان التعلم الإلكتروني يمكن ان يساعد على التفاعل بين المتعلّمين</td>
<td></td>
</tr>
<tr>
<td>I am satisfied with using e-learning personalised activities</td>
<td>راضي عن استخدام الأنشطة الفردية في نظام التعلم الإلكتروني</td>
<td></td>
</tr>
<tr>
<td>I believe e-learning can assist me to concentrate on my learning</td>
<td>اعتقد ان التعلم الإلكتروني يمكن ان يساعد على التركيز في تعلمي</td>
<td></td>
</tr>
<tr>
<td>I am satisfied with using e-learning assessment</td>
<td>راضي عن استخدام نظام التعلم الإلكتروني في التقييم</td>
<td></td>
</tr>
<tr>
<td>I am satisfied with e-learning functions</td>
<td>راضي عن التعلم باستخدام نظام التعلم الإلكتروني</td>
<td></td>
</tr>
<tr>
<td>I believe using e-learning will improve my learning</td>
<td>اعتقد ان استخدام التعلم الإلكتروني سيحسن مستوى العلمي</td>
<td></td>
</tr>
<tr>
<td>I am satisfied with the learning reinforcement inside the e-learning</td>
<td>راضى عن الدعم الموجود في نظام التعلم الالكتروني</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Evaluation during development:</td>
<td>التقييم خلال التطوير</td>
<td></td>
</tr>
<tr>
<td>I believe that the colour of the background is suitable</td>
<td>اعتقد ان لون الخلفية مناسب</td>
<td></td>
</tr>
<tr>
<td>I believe that the colours of fonts are suitable for my eyes</td>
<td>اعتقد ان لون الكلام كان مناسب للعين</td>
<td></td>
</tr>
<tr>
<td>I believe that the font size is suitable to read</td>
<td>اعتقد ان حجم الخط كان مناسب للقراءة</td>
<td></td>
</tr>
<tr>
<td>I believe that the organisation of the content is good</td>
<td>اعتقد ان تنظيم المحتوى كان جيدا</td>
<td></td>
</tr>
<tr>
<td>Learning Outcomes:</td>
<td>مخرجات التعلم</td>
<td></td>
</tr>
<tr>
<td>I believe e-learning can assist improving the student's</td>
<td>اعتقد ان التعليم الالكتروني يمكن أن يساعد على تحسين معلومات التعلم</td>
<td></td>
</tr>
<tr>
<td>knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe e-learning can assist improving the student's</td>
<td>اعتقد ان التعليم الالكتروني يمكن أن يساعد على تحسين مهارات (اداء) التعلم</td>
<td></td>
</tr>
<tr>
<td>skills (performance)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe e-learning can improve learning motivations</td>
<td>اعتقد ان التعليم الالكتروني يمكن أن يزيد دافعية التعلم</td>
<td></td>
</tr>
<tr>
<td>I believe e-learning can assist improving the student's</td>
<td>اعتقد ان التعليم الالكتروني يمكن أن يزيد من فهم المتعلم للمادة العلمية</td>
<td></td>
</tr>
<tr>
<td>understanding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I intend to use e-learning to assist my learning in the</td>
<td>انوى استخدام التعليم الالكتروني كي يساعدني في التعلم مستقبلا</td>
<td></td>
</tr>
<tr>
<td>future</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I intend to use e-learning content to assist my learning</td>
<td>انوى استخدام محتوى التعليم الالكتروني لمساعدتي في التعلم مستقبلا</td>
<td></td>
</tr>
<tr>
<td>in the future</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statement</td>
<td>Arabic Translation</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------</td>
<td></td>
</tr>
<tr>
<td>I intend to use e-learning activities to assist my learning in the future</td>
<td>أنوى استخدام الشبكة التعلم الإلكتروني لمساعدتي في التعلم مستقبلاً</td>
<td></td>
</tr>
<tr>
<td>I intend to use e-learning to assist my learning in the future</td>
<td>أنوى استخدام نظام التعلم الإلكتروني لمساعدتي في التعلم مستقبلاً</td>
<td></td>
</tr>
<tr>
<td>I believe e-learning content is informative</td>
<td>أعتقد أن محتوى التعلم الإلكتروني يوفر المعلومات بسهولة</td>
<td></td>
</tr>
<tr>
<td>I believe e-learning content is useful</td>
<td>أعتقد أن محتوى التعلم الإلكتروني مفيد</td>
<td></td>
</tr>
<tr>
<td>I believe e-learning is a useful method of curriculum delivery</td>
<td>أعتقد أن التعلم الإلكتروني طريق مفيدة لتدريس المناهج</td>
<td></td>
</tr>
<tr>
<td>I believe I can use the knowledge I gained effectively in my work</td>
<td>أعتقد أنني أستطيع استخدام المعلومات التي اكتسبتها بفاعلية في عملي</td>
<td></td>
</tr>
</tbody>
</table>

### Stakeholders Satisfaction:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Arabic Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The e-learning system met my expectations</td>
<td>نظام التعلم الإلكتروني حقق توقعاتي</td>
</tr>
<tr>
<td>The e-learning system was effective</td>
<td>نظام التعلم الإلكتروني كان فعالاً</td>
</tr>
<tr>
<td>The e-learning system is necessary for teaching the curricula</td>
<td>نظام التعلم الإلكتروني ضروري لتدريس المقرر</td>
</tr>
<tr>
<td>I feel confident using e-learning systems</td>
<td>أشعر بالثقة باستخدام نظام التعلم الإلكتروني</td>
</tr>
<tr>
<td>I feel confident using e-learning content</td>
<td>أشعر بالثقة باستخدام محتوى التعلم الإلكتروني</td>
</tr>
<tr>
<td>I feel confident using e-learning activities</td>
<td>أشعر بالثقة باستخدامأنشطة التعلم الإلكتروني</td>
</tr>
<tr>
<td>I feel confident using e-learning assessment</td>
<td>أشعر بالثقة باستخدام نظم التقييم في التعلم الإلكتروني</td>
</tr>
<tr>
<td>Questions in English (Second part)</td>
<td>Questions in Arabic (Second Part)</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Which learning style do you prefer?</td>
<td>اي نمط تعلم يفضله؟</td>
</tr>
<tr>
<td>1. E-learning.</td>
<td>1. التعلم الإلكتروني.</td>
</tr>
<tr>
<td>2. Traditional Paper Based.</td>
<td>2. التعلم التقليدي (الورقي).</td>
</tr>
<tr>
<td>3. Both.</td>
<td>3. كلاهما.</td>
</tr>
<tr>
<td>4. Not Sure.</td>
<td>4. لست متأكدا.</td>
</tr>
</tbody>
</table>

| When undertaking e-learning course, how would you rate your satisfaction with it? | عند استخدامك لنظام تعلم الإلكتروني كيف تقيم رضاك عن التعلم بواسطة؟ |          |
| 1. Very Satisfied. | 1. مرضي جدا. |          |
| 2. Satisfied. | 2. مرضي. |          |
| 3. Don't Know. | 3. لا أعرف. |          |
| 4. Unsatisfied. | 4. غير مرضي. |          |
| 5. Very Unsatisfied. | 5. غير مرضي جدا. |          |

<p>| Did the course (undertaken one) provide appropriate collaboration activities for you? | هل وفر لك نظام التعلم الإلكتروني (الدى درست بواسطة) انشطة تعاونية ملائمة لك؟ |          |
| 1. Yes. | 1. نعم. |          |
| 2. No. | 2. لا. |          |
| Please comment: ................................................ | من فضلك أعطنا تعليقك: ................................................ |          |</p>
<table>
<thead>
<tr>
<th>Question</th>
<th>Arabic</th>
<th>Options</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you received sufficient guidance on how to succeed on your course?</td>
<td>هل تلقيت توجيه كافٍ عن كيفية النجاح في المنهج الذي تدرس؟</td>
<td>1. Yes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. No.</td>
<td></td>
</tr>
<tr>
<td>Please comment:</td>
<td>من فضلك اعدّ تعليقك:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have you had sufficient opportunities to give your point of view?</td>
<td>هل وجدت فرص كافية لتوضيح وجهة نظرك؟</td>
<td>1. Yes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. No.</td>
<td></td>
</tr>
<tr>
<td>If no, Why not</td>
<td>لو كانت الإجابة ب لا ما هي الأسباب:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was the content of your course suitable for online education?</td>
<td>هل كان محتوى المنهج الذي درسته مناسب لتعليم على الشبكة؟</td>
<td>1. Yes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. No.</td>
<td></td>
</tr>
<tr>
<td>Please comment:</td>
<td>من فضلك اعدّ تعليقك:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What did you expect to learn from the e-learning course?</td>
<td>ما الذي توقع أن تتعلم من التعليم الالكتروني؟</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Options</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you achieve what you expected to learn?</td>
<td>1. Yes. 2. No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please comment:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will the course help you in your job? (If applicable)</td>
<td>1. Yes. 2. No. 3. Don't Know.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please comment:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In undertaking the course how would you rate your experience?</td>
<td>1. Positive experience. 2. Negative experience.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please comment:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did the course provide lecture/student interactions?</td>
<td>1. Yes. 2. No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please comment:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
### Did the course provide student/student interactions?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Yes.</td>
</tr>
<tr>
<td>2.</td>
<td>No.</td>
</tr>
</tbody>
</table>

Please comment: ........................................

### Did the course provide networked learning (forums, discussions, chat)?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Yes.</td>
</tr>
<tr>
<td>2.</td>
<td>No.</td>
</tr>
</tbody>
</table>

Please comment: ........................................

### If you had a choice of the methods you delivered your course with which method would you prefer?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Paper-Based.</td>
</tr>
<tr>
<td>2.</td>
<td>E-learning.</td>
</tr>
</tbody>
</table>

Please explain why: .................................
The interview schedule

The interview schedule on the next page will be used to gain feedback on the e-learning system in one main aspect: quality of e-learning and four sub aspects: stakeholders’ satisfaction, learning outcomes, evaluation during development, environment facilities.

The main focus for these interviews is to reach initial information about the efficacy of e-learning systems to the Egyptian higher education; I have a list of topics that I would like to discuss over the next 20 minutes. Your comments will be strictly confidential in that they will not be associated with you or your faculty/college.
<table>
<thead>
<tr>
<th>Questions in English</th>
<th>Questions in Arabic</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learners Schedule:</strong></td>
<td>اسئلة المتعلمين</td>
<td></td>
</tr>
<tr>
<td>What expectations did you have of e-learning systems before participating in the computer-maintenance course?</td>
<td>ما الذي كنت تتوقعه بالنسبة لنظم التعليم الإلكتروني قبل اشراكك في نظام التعليم الإلكتروني لمنهج صيانة أجهزة الحاسوب؟</td>
<td></td>
</tr>
<tr>
<td>Did you find what you were expecting in the computer-maintenance course (VLE)?</td>
<td>وهل وجدت ما كنت تتوقعته في نظام التعليم الإلكتروني لمنهج صيانة أجهزة الحاسوب بواسطة (بيئة التعليم التحليلي)؟</td>
<td></td>
</tr>
<tr>
<td>Can you identify an event or incident during the e-learning course that led you to change your opinions or expectations of e-learning systems?</td>
<td>هل يمكنك أن تخبرني بحادثة أو واقعة حدثت خلال تعلمي من خلال التعليم الإلكتروني فأنك تغيير رأيك أو توقعاتك لنظام التعليم الإلكتروني؟</td>
<td></td>
</tr>
<tr>
<td>How would you evaluate your experience with the VLE?</td>
<td>كيف تقيم تجربتك في استخدام نظام التعليم الإلكتروني</td>
<td></td>
</tr>
<tr>
<td>Why did you find it good...?</td>
<td>لماذا وجدت الدراسة بالتعلم الإلكتروني مرضية؟</td>
<td></td>
</tr>
<tr>
<td>Did you expect to face a lot of difficulties in learning with e-learning systems?</td>
<td>هل توقعت مواجهة صعوبات كثيرة في التعلم بواسطة النظام الإلكتروني؟</td>
<td></td>
</tr>
<tr>
<td>Why did you expect so?</td>
<td>لماذا و根据不同</td>
<td></td>
</tr>
<tr>
<td>And did you find any difficulties in learning using VLEs after studying the computer-maintenance course?</td>
<td>وهل وجدت أي صعوبات في التعلم باستخدام بيئة التعليم التحليلي أثناء دراستك لمنهج صيانة أجهزة الحاسوب؟</td>
<td></td>
</tr>
<tr>
<td>What was difficult in dealing with the VLE?</td>
<td>ما الذي من الصعب في التعامل معه أثناء دراستك لنظام التعليم الإلكتروني؟</td>
<td></td>
</tr>
<tr>
<td>Did you expect dealing with VLEs to be so easy?</td>
<td>هل توقع أن تكون التفاعل مع بيئة التعلم التحليلي بهذه السهولة؟</td>
<td></td>
</tr>
<tr>
<td>Would you like to take another course using VLEs? Why?</td>
<td>هل تود أن تقوم برداية منهج آخر باستخدام بيئة التعلم التحليلي ولماذا؟</td>
<td></td>
</tr>
<tr>
<td>How do you rate your experience with learning using VLEs?</td>
<td>كيف تقيم تجربتك تعلمك باستخدام بيئة التعلم التحليلي؟</td>
<td></td>
</tr>
</tbody>
</table>
Were there any surprise resulting from using VLEs?  هل حدثت أي مفاجأت أثناء استخدام منصة التعليم التخليضية؟

Was the system easy to use regarding the required technological skills?  هل كانت المهارات التكنولوجية المتطلبة لاستخدام التعليم الإلكتروني بسيطة؟

How would you rate your internet self efficacy?  كيف تقيم استعدادك الذاتي على النت من خلال الإنترنت؟

**Instructors Schedule:**

<table>
<thead>
<tr>
<th>Question</th>
<th>Arabic</th>
</tr>
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<tbody>
<tr>
<td>Were there any surprise resulting from using VLEs?</td>
<td>هل حدثت أي مفاجأت أثناء استخدام منصة التعليم التخليضية؟</td>
</tr>
<tr>
<td>Was the system easy to use regarding the required technological skills?</td>
<td>هل كانت المهارات التكنولوجية المتطلبة لاستخدام التعليم الإلكتروني بسيطة؟</td>
</tr>
<tr>
<td>How would you rate your internet self efficacy?</td>
<td>كيف تقيم استعدادك الذاتي على النت من خلال الإنترنت؟</td>
</tr>
<tr>
<td>What thoughts did you have about when to use e-learning systems?</td>
<td>ما الأفكار التي كانت لديك عن وقت استخدام منصة التعليم الإلكتروني؟</td>
</tr>
<tr>
<td>Did you see any barriers to implement your philosophy of teaching and your curricula in a VLE? If yes what are these barriers?</td>
<td>هل واجدت أي موانع تعوق تحويل فلسفة التدريس أو تحويل مناهج إلى نظام التعليم الإلكتروني وما هي هذه الموانع؟</td>
</tr>
<tr>
<td>What did you find difficult using e-learning systems?</td>
<td>ما الذي كان صعب الاستخدام في منصة التعليم الإلكتروني؟</td>
</tr>
<tr>
<td>Do you think e-learning is different from FTF? Why?</td>
<td>هل تخجل أن التعليم الإلكتروني يختلف عن التعليم العادي؟ ولماذا؟</td>
</tr>
<tr>
<td>Do you think e-learning will change the roles and responsibilities of the teacher and the learners? If yes, in what way?</td>
<td>هل تخجل أن التعليم الإلكتروني سيغير منادو ومسؤوليات المعلم والمتعلم؟ وبأي طريقة؟</td>
</tr>
<tr>
<td>Do you think e-learning will enable learners to replace the teacher's roles?</td>
<td>هل تخجل أن التعليم الإلكتروني سيمكن المتعلمين من تبادل الأدوار مع المعلمين؟</td>
</tr>
<tr>
<td>What is your definition of motivation? Do you belief that e-learning will increase student’s motivation?</td>
<td>ما هو تعريفك للدافعة؟ وهل تخجل أن التعليم الإلكتروني سيزيد من دافعة المتعلمين؟</td>
</tr>
<tr>
<td>How would you rate the activities in the e-learning?</td>
<td>كيف تقيم الأنشطة في منصة التعليم الإلكتروني؟</td>
</tr>
<tr>
<td>How would you assess your satisfaction with the computer-maintenance VLE?</td>
<td>كيف تقيم رضاك عن منصة التعليم التخليضية الخاصة بمهم صيانة أجهزة الحاسوب؟</td>
</tr>
<tr>
<td>Was the VLE compatible with different kind of browsers</td>
<td>هل كانت منصة التعليم التخليضية ملائمة لمختلف أنواع المنصات التي نستخدمها؟</td>
</tr>
</tbody>
</table>
you have used?

<table>
<thead>
<tr>
<th><strong>Educational Institutions Schedule:</strong></th>
<th><strong>أسئلة المؤسسات التعليمية:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>What did you expect your institution will gain from the e-learning system?</td>
<td>ما الذي توقعته أن يجازف مؤسستك التعليمية من استخدام التعليم الإلكتروني؟</td>
</tr>
<tr>
<td>What was your point of view about e-learning systems?</td>
<td>كيف كانت وجهة نظرك لتعليم التعليم الإلكتروني؟</td>
</tr>
<tr>
<td>And is this point of view still the same after you use the computer-maintenance VLE?</td>
<td>وهل تغيرت هذه الرؤية بعد استخدامك لبيئة التعليم التحليلي للتدريب منهج صيانة أجهزة الحاسوب؟</td>
</tr>
<tr>
<td>In what way did this VLE change your views about e-learning?</td>
<td>وبأي صورة تغيرت وجهة نظرك عن التعليم الإلكتروني؟</td>
</tr>
<tr>
<td>Will you encourage your institutions’ researchers to conduct research regarding the benefits of e-learning?</td>
<td>هل ستتشجع الباحثين في مؤسستك التعليمية للقيام ببحث يتعلق بالاستفادة من ميزات التعليم الإلكتروني؟</td>
</tr>
<tr>
<td>What thoughts did you have about how to use e-learning systems?</td>
<td>ما هي الأفكار التي كانت تليك عن كيفية استخدام التعليم الإلكتروني؟</td>
</tr>
<tr>
<td>And did any of these thoughts change by using computer-maintenance e-learning?</td>
<td>وهل تغيرت أي من هذه الأفكار بعد استخدامك لتعليم التعليم الإلكتروني للتعليم منهج صيانة أجهزة الحاسوب؟</td>
</tr>
<tr>
<td>How do you see your institution could benefit from e-learning systems?</td>
<td>كيف ترى وجه الاستفادة لمؤسسة التعليم التحليلي من نظام التعليم الإلكتروني؟</td>
</tr>
<tr>
<td>What are the possibilities of using VLEs in teaching in your institution?</td>
<td>ما هي احتمالات استخدام بيئة التعليم التحليلي كأداة أصلية التعليم الإلكتروني في التدريس في مؤسستك التعليمية؟</td>
</tr>
</tbody>
</table>

Thank you for your contributions,
The researcher:
Tamer Sameer AbdEl-Badea AbdEl-Gawad
## Appendix 4 Experts’ Names and Contributions

<table>
<thead>
<tr>
<th>Names</th>
<th>Piloting Data collection Methods</th>
<th>VLE (EEM) from Southampton</th>
<th>Usability Test from Egypt</th>
<th>The accessibility of the Achievement Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Mariam Al-Aly</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mariam Mohamad</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Maged El-Kahtany</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AbdEl-Aziz Al-Harbi</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abdulhamid Alarfaj</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mohamed Ageel</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Rasha Ramadan</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Rania Mohamed</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Saad AbdEl-Moneam</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
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</tbody>
</table>
Appendix 5 Quantitative Data Analysis

T-Test for the pre-test post-test analysis:

<table>
<thead>
<tr>
<th>Paired Samples Statistics</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>4.09</td>
<td>34</td>
<td>2.021</td>
<td>.347</td>
</tr>
<tr>
<td>Post-test</td>
<td>7.49</td>
<td>34</td>
<td>1.626</td>
<td>.279</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Paired Samples Correlations</th>
<th>N</th>
<th>Correlation</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1 Pre-test &amp; Post-test</td>
<td>34</td>
<td>.530</td>
<td>.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Paired Samples Test</th>
<th>Paired Differences</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Deviation</td>
<td>Std. Error Mean</td>
<td>95% Confidence Interval of the Difference</td>
</tr>
<tr>
<td>Pair 1 Pre-test – post-test</td>
<td>-3.400</td>
<td>1.801</td>
<td>.309</td>
<td>-4.028</td>
</tr>
</tbody>
</table>

Calculating the amount of influence

\[ \eta^2 = \frac{t^2}{(t^2 + df)} \]

\[ \eta^2 = \frac{(11.007)^2}{((11.007)^2 + 33)} \]

\[ \eta^2 = 0.786 \]
Reliability of the Learning Environment Section

### Case Processing Summary

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid</td>
<td>27</td>
<td>38.6</td>
</tr>
<tr>
<td>Excluded(^a)</td>
<td>43</td>
<td>61.4</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\(^a\) Listwise deletion based on all variables in the procedure.

### Reliability Statistics

<table>
<thead>
<tr>
<th></th>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>.744</td>
<td>11</td>
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### Item-Total Statistics

<table>
<thead>
<tr>
<th></th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>(first Question)</td>
<td>37.59</td>
<td>23.866</td>
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<td>Q1</td>
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<td>24.692</td>
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<td>Q9</td>
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<td>Q10</td>
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Reliability for the Evaluation during Development Section
### Case Processing Summary

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<sup>a</sup> Listwise deletion based on all variables in the procedure.

### Reliability Statistics

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### Item-Total Statistics

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Reliability for the Learning Outcomes Section

Case Processing Summary

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<th>%</th>
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</thead>
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<td></td>
</tr>
<tr>
<td>Valid</td>
<td>27</td>
<td>38.6</td>
</tr>
<tr>
<td>Excluded(^a)</td>
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<td>61.4</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
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</tbody>
</table>

\(^a\) Listwise deletion based on all variables in the procedure.

Reliability Statistics

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Item-Total Statistics

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<td>Q17</td>
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<td>.425</td>
<td>.859</td>
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<tr>
<td>Q25</td>
<td>39.56</td>
<td>30.795</td>
<td>.562</td>
<td>.850</td>
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<tr>
<td>Q26</td>
<td>38.93</td>
<td>30.610</td>
<td>.637</td>
<td>.844</td>
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</table>
### Reliability for the Stakeholders’ Satisfaction Section

#### Case Processing Summary

<table>
<thead>
<tr>
<th>Cases</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>27</td>
<td>38.6</td>
</tr>
<tr>
<td>Excludeda</td>
<td>43</td>
<td>61.4</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>100.0</td>
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</tbody>
</table>

*a. Listwise deletion based on all variables in the procedure.*

#### Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
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<tbody>
<tr>
<td>.859</td>
<td>7</td>
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</tbody>
</table>

#### Item-Total Statistics

<table>
<thead>
<tr>
<th>Item</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q27</td>
<td>20.93</td>
<td>22.302</td>
<td>.328</td>
<td>.877</td>
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<tr>
<td>Q28</td>
<td>20.67</td>
<td>20.538</td>
<td>.621</td>
<td>.841</td>
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<td>Q29</td>
<td>21.22</td>
<td>20.103</td>
<td>.615</td>
<td>.841</td>
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<td>Q30</td>
<td>21.19</td>
<td>18.234</td>
<td>.789</td>
<td>.815</td>
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<tr>
<td>Q31</td>
<td>21.11</td>
<td>18.026</td>
<td>.740</td>
<td>.822</td>
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<td>Q32</td>
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<td>19.293</td>
<td>.663</td>
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<td>Q33</td>
<td>21.52</td>
<td>18.490</td>
<td>.647</td>
<td>.837</td>
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</tbody>
</table>
Appendix 6 Computer-maintenance VLE

The main screen in the VLE
The Achievement Test

Choose one answer.

- a. FDD Connector
- b. IDE Connector
- c. ISA slot
- d. PCI slot
- e. AGP slot
- f. mouse connector
- g. Serial port
- h. Parallel connector

Marks: 1

2

Choose one answer.

- a. اثنان
- b. ثلاثة

Marks: 1
Choose one answer.

- a. IDE Connector
- b. FDD connector
- c. Parallel connector
- d. power connector
- e. ISA slot
- f. PCI slot
- g. BIOS
- h. AGP slot
Choosing one answer.

5. Choose one answer. [5 Marks: 1]

- a. AT
- b. ATX
- c. NLX
- d. ATX

6. Choose one answer. [6 Marks: 1]

- a. AGP slot
- b. Parallel connector
- c. PCI slot
- d. BIOS
- e. IDE Connector
- f. ISA slot
7. **ATX** ما هو النوع الأم من نوع ATX في اللوحة الأم؟
   <br>Choose one answer.
   - a. BNC
   - b. PCI
   - c. RAM SLOTS
   - d. PCI

8. أي أنواع المنافذ المذكورة التالية طورتها شركة APPLE لنقل الفيديو الرقمي؟
   - Choose one answer.
   - a. DVD
   - b. USB
   - c. IEEE 1394
   - d. IEEE 1284

9. أكثر الطرق فاعلية كي يحمل الكمبيوتر من أسطوانات
   - Choose one answer.
   - a. عطل القرص الصلب الرئيسي
   - b. Primary Master
   - c. CMOS
   - d. غير إعدادات مشغل الأسطوانات على أن تكون قابلة للتحميل.

10. سبب ظهور روتين كارت الشاشة أولا عند بدء تشغيل الجهاز هو ...
    - Choose one answer.
    - a. احتواء كارت الشاشة على ثانية
    - b. POST
    - c. لأن كارت الشاشة فحص أولا من قبل
    - d. لأن نظام التشغيل يفحص كارت الشاشة أولا.
1. بخزن تاريخ ووقت النظام عندما يكون النظام مغلق في ......
   - a. RAM
   - b. CMOS
   - c. القرص الصلب
   - d. القرص المرن

2. أي أنواع الوصلات الثنائية لا تقترن عادة مع جهاز الماوس؟
   - a. وصلة تسليمة
   - b. وصلة متزامنة
   - c. وصلة ماس دابل
   - d. PS/2

3. هي اختصار العبارة ISA
Choose one answer.

- a. PCI slots
- b. IDE Connector
- c. ISA slots
- d. AGP slots
- e. Parallel connector
- f. power connector
- g. Serial port
- h. FDD connector
Choose one answer.

- a. PCI expansion slot
- b. AGP expansion slot
- c. RAM Slots
- d. Mouse Connector
- e. BIOS
- f. ISA slot
- g. IDE connector
- h. منفذ طابعة متوازي
Choose one answer.

- a. Printer Parallel connector
- b. IDE connector
- c. ISA slot
- d. PCI expansion slot
- e. AGP expansion slot
- f. BIOS
- g. Processor connector
- h. RAM Slots
Choose one answer.

- a. ISA slots
- b. Parallel connector
- c. PCI slots
- d. power connector
- e. IDE Connector
- f. BIOS
- g. AGP slots
- h. FDD connector
Choose one answer.

- a. RAM slot
- b. ISA slot
- c. AGP slot
- d. BIOS
- e. Keyboard connector
- f. Mouse connector
- g. Serial port
- h. Power connector

Choose one answer.

- a. AGP
- b. PCI
- c. ISA
21 Marks: 1
Choose one answer.

- a. الأرجل
- b. المباعات
- c. الأربطة الفضائية
- d. الأربطة السحابة

22 Marks: 1
Choose one answer.

- a. processor connector
- b. Printer Parallel connector
- c. PCI expansion slot
- d. IDE connector
- e. ISA slot
- f. BIOS
- g. ALU
Choose one answer.

- a. Keyboard connector
- b. BIOS
- c. RAM Slots
- d. PCI expansion slot
- e. ISA slot
- f. IDE connector
- g. بطارية اللوحة الأم
- h. FDD connector

Choose one answer.

- a. CMOS Battery
- b. IDE Connector
- c. ISA slot
- d. Parallel connector
- e. PCI slot
- f. power connector
- g. BIOS
- h. Serial port
Choose one answer.

- a. USB.
- b. SERIAL.
- c. SCSI.
- d. PARALLEL.

26 %

عرض ناقل PCI هو........

Marks: 1

Choose one answer.

- a. 32 bit
- b. 16 bit
- c. 64 bit
- d. 128 bit

27 %

أي من الناقلات التالية يستخدم ممر بيانات عرضه 16 بيت.

Marks: 1

Choose one answer.

- a. ISA.
- b. PCI.
- c. AGP.
- d. PCI EX1.
## The Activities Report

### Activity report

**Computed from logs since Saturday, 22 November 2008, 05:18 AM.**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Views</th>
<th>Last access</th>
</tr>
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<tbody>
<tr>
<td>منتدي للاعلان عن آخر الاخبار الخاصة بالنظام</td>
<td>338</td>
<td>Monday, 8 March 2010, 06.41 AM (351 days 2 hours)</td>
</tr>
<tr>
<td>اجزاء اللوحة الأم</td>
<td>134</td>
<td>Tuesday, 22 December 2009, 10.05 AM (1 year 61 days)</td>
</tr>
<tr>
<td>منتدي عن التوقعات للاستقلال من هذا النظام</td>
<td>382</td>
<td>Monday, 8 March 2010, 07.11 AM (351 days 1 hour)</td>
</tr>
<tr>
<td>اختبار تصميمي</td>
<td>379</td>
<td>Tuesday, 22 February 2011, 07.39 AM (1 hour 28 mins)</td>
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</table>

#### Week 1

<table>
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<tr>
<th>Activity</th>
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<tbody>
<tr>
<td>محادثة عن التطبيقات للاستفادة من هذا النظام</td>
<td>225</td>
<td>Monday, 8 March 2010, 05.56 AM (351 days 3 hours)</td>
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<tr>
<td>المحاضرة الأولى - أنواع اللوحات الأم</td>
<td>121</td>
<td>Thursday, 6 August 2009, 01.32 PM (1 year 199 days)</td>
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<tr>
<td>مكونات اللوحة الأم</td>
<td>73</td>
<td>Tuesday, 22 December 2009, 10.05 AM (1 year 61 days)</td>
</tr>
<tr>
<td>تعريف بمكونات اللوحة الأم</td>
<td>42</td>
<td>Saturday, 9 May 2009, 11.57 AM (1 year 288 days)</td>
</tr>
<tr>
<td>بما هي اللوحة الأم؟</td>
<td>39</td>
<td>Tuesday, 21 April 2009, 11.06 AM (1 year 306 days)</td>
</tr>
<tr>
<td>مزود الطاقة</td>
<td>32</td>
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<td>Monday, 13 April 2009, 01.22 PM (1 year 314 days)</td>
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<tr>
<td>ترجمة لوحه أت</td>
<td>40</td>
<td>Saturday, 25 April 2009, 04.29 PM (1 year 302 days)</td>
</tr>
<tr>
<td>تجميع جهاز الحاسب الآلي</td>
<td>33</td>
<td>Thursday, 6 August 2009, 01.33 PM (1 year 199 days)</td>
</tr>
<tr>
<td>منتدي عن أنواع اللوحات الأم</td>
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</tr>
<tr>
<td>عن أنواع اللوحات الأم WIKI</td>
<td>351</td>
<td>Thursday, 6 August 2009, 10.15 AM (1 year 199 days)</td>
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#### Week 2

<table>
<thead>
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<th>Activity</th>
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<tr>
<td>المحاضرة الثانية - تتبعات التوسيعة</td>
<td>84</td>
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<tr>
<td>المحاضرة الثانية - الرام</td>
<td>46</td>
<td>Friday, 1 May 2009, 02.28 PM (1 year 296 days)</td>
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<tr>
<td>محادثة عن تتبعات التوسيعة والرام</td>
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<tr>
<td>أنواع تتبعات التوسيعة</td>
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<td>Tuesday, 21 April 2009, 11.34 AM (1 year 306 days)</td>
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<tr>
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<td>Saturday, 25 April 2009, 04.31 PM (1 year 302 days)</td>
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<td>تحميل الرام</td>
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<td>إجراء بحث</td>
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<td>Monday, 10 August 2009, 05.12 PM (1 year 195 days)</td>
</tr>
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</table>
Appendix 6 Computer-maintenance VLE

**Week 3**

- Saturday, 9 May 2009, 11:56 AM (1 year 288 days)
- Saturday, 9 May 2009, 11:54 AM (1 year 288 days)
- Saturday, 25 April 2009, 05:03 PM (1 year 302 days)
- Saturday, 25 April 2009, 05:01 PM (1 year 302 days)
- Saturday, 25 April 2009, 05:02 PM (1 year 302 days)
- Monday, 8 March 2010, 06:28 AM (351 days 2 hours)
- Tuesday, 9 March 2010, 07:32 AM (350 days 1 hour)
- Wednesday, 22 April 2009, 12:35 PM (1 year 305 days)

**Week 4**

- Friday, 1 May 2009, 02:28 PM (1 year 290 days)
- Wednesday, 26 January 2011, 05:51 AM (27 days 3 hours)
- Saturday, 25 April 2009, 05:07 PM (1 year 302 days)
- Saturday, 9 May 2009, 11:54 AM (1 year 288 days)
- Saturday, 25 April 2009, 05:08 PM (1 year 302 days)
- Saturday, 25 April 2009, 05:09 PM (1 year 302 days)
- Saturday, 25 April 2009, 05:11 PM (1 year 302 days)
- Saturday, 25 April 2009, 05:12 PM (1 year 302 days)
- Saturday, 25 April 2009, 05:14 PM (1 year 302 days)

**Week 5**

- Tuesday, 22 February 2011, 07:39 AM (1 hour 28 mins)
- Thursday, 11 June 2009, 06:11 AM (1 year 256 days)
- Tuesday, 9 March 2010, 09:05 AM (350 days)
- Wednesday, 26 January 2011, 05:53 AM (27 days 3 hours)
- Wednesday, 26 January 2011, 05:52 AM (27 days 3 hours)
Appendix 7 Poster

Investigating the Efficacy of e-learning for Egyptian Higher Education

The research uses Case Study to investigate the efficacy of e-learning in the Egyptian higher education context and to produce a model of implementing and evaluating quality in e-learning systems. A range of methods are considered including Interviews, questionnaire, focus groups, and an achievement test to collect the data.

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Tanta University, Egypt

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