Original Research　　　　　　　　　　　　　　　　　　　　　　　　**Open Access**

Evaluation of Self e-learning-Based Courses from the Perspectives of Learners and Academic Staff Members at Al-Ahliyya Amman University

Sawsan Saad- Eddin Badrakhan*
Al-Ahliyya Amman University, Jordan

Mohammed Ahmed Mbaydeen
Al-Ahliyya Amman University, Jordan

Abstract
The purpose of the study is to identify the degree of Al-Ahliyya Amman University (AAU) learners' and academic staff members' evaluation of self e-learning- based courses in terms of their educational content, the technical design of electronic techniques and activities, availability and accessibility. The sample of the study consisted of (353) learners who were selected by a simple random methodology involving learners taking the self e-learning- based courses. Five members were selected from the academic staff as coordinators of these courses. The researchers developed a 39-item tool divided into four domains, and they examined their validity and reliability. The study found that the degree of evaluation of the self e-learning-based courses from the perspective of both learners and academic staff members at AAU was high according to the assessment of the technical design of electronic techniques, activities and the evaluation of their availability and accessibility. The research paper also showed that there were no statistically significant differences according to its variables (profession, gender, faculty, and course).

Keywords: Evaluation; E-learning; Self e-learning; Electronic courses; Al-ahliyya amman university.

1. Introduction

The last decade of the twenty-first century has been characterized by a tremendous development in information and communication technology and the widespread of Internet networks and its applications accompanied with an incredible progress in human knowledge, especially scientific and technological awareness over short periods of time.

Undoubtedly, E-learning contributes to a large extent in bridging the correlation ship between learners and teachers, by supporting the utilization of the Internet and digital technologies, which has become a powerful medium and network for education and distance-learning (Qashmar, 2017). Moreover, E-learning is an innovative approach that provides a student-centered, well-designed and accessible interactive structure for all learners (Al-Dhalan, 2017), who have an easy access to the Internet and digital technologies' advantages and resources in accordance with the principles of appropriate educational design for open and visual learning environment (Awadh *et al.*, 2017). Thus, learners easily interact with the content, electronic and educational resources as well as teachers and their colleagues, whether these resources are based on computer utilization E-learning based environment or on electronic networks (Afifi *et al.*, 2016).

Amado-Salvatierra *et al.* (2016), argue that e-learning refers to online learning. In this regard, Clark and Mayer (2011) believe that e-learning is a relatively modern term based on the learners' needs and capacities, while using online-based electronic media to deliver e-content simultaneously or successively (lectures, lessons and courses, discussions, exercises, and tests). Such learning can be monitored from the university lobby classrooms or from outside through the university website or its electronic gate (Al-Guthami, 2019).

The interest in improving e-learning and boosting its quality has increased recently due to the importance of e-learning and the worldwide utilization of its applications in many international and Arab universities (Hussin *et al.*, 2009). Accordingly, the quality assurance of e-learning has become a new challenge facing the electronic learning system in various universities, since ignoring the significance of this challenge will negatively affect the quality of the academic programs and e-courses (Hattabi, 2019).

Actually, the success of any education system is extremely dependent on adhering to internationally approved criteria and standards (Masoudi, 2018). Regarding e-learning, the standards of designing and evaluating distance learning and other standards related to applied technology is strongly associated with the quality of e-learning programs (Teo *et al.*, 2006). Hsu *et al.* (2009) argue that designing web-based e-learning courses in light of comprehensive quality standards not only improves the quality of online learning and facilitates learning and sharing of its resources, but also promotes self-learning.

Hence, there is a close correlation between the concepts of e-learning and self-learning, as e-courses have become became the best methods used in educational institutions to achieve effective self-learning which is considered a learning strategy that involves personal attitudes towards e-learning (Alanzi, 2018). It also includes extra tools that boost learners' abilities to monitor and follow-up their self-learning and enhances their self-

---

*Corresponding Author

confidence, as well as their role in self-control and independence besides improving self-control and management of the learning process (Hennawi, 2017).

According to Al-Rahmi *et al.* (2018), e-learning courses are presented online to facilitate self-learning through the network websites service and create an appropriate self-e-learning environment. It also offers additional services and facilities, such as networking, forums, blogs, e-mail, chat rooms and programs, and file and document sharing tools (Dabbagh and Kitsantas, 2004).

Al-rahmi *et al.* (2015a), emphasize that self-directed learning style through e-courses is a direct application of the concept of e-learning; since e-courses are only a model of individual self-learning. Adopting the self e-learning-based courses to replace traditional courses, these courses should be designed by professors, and then transformed into e-courses according to e-learning standards and specifications (Clark and Mayer, 2011). Abu-Khatwa (2011) believes that in order to achieve the desired benefits from self-managed e-courses, some standards have to be adopted by educational institutions when designing their e-courses including their compliance to high quality requirements, so as to take these criteria into account when evaluating these e-courses.

A group of researchers including (Hsu *et al.*, 2009; Hussin *et al.*, 2009; Moller *et al.*, 2008; More and Pinhey, 2016; Vovides *et al.*, 2007; Zaharias and Poulymena, 2008), concluded several findings and agreed on the most important criteria for evaluating and designing courses based on self-e-learning approach, namely: good educational content, the ability to retrieve educational content, formal aspects represented by technical design, costs, financial requirements, easy navigation exploring, organization and arrangement, taking into account the characteristics of the learners, interactive services, hyperlinks , credibility, modernity, objective coverage, accuracy, security and privacy.

According to Ahmed and Sa'eed (2014) and Almogren (2019) the success of self e-learning depends on the level of the good and appropriate design of the e-courses' elements, and the integrity of all aspects in order to achieve the desired goal. Hence, the process of designing courses based self-e-learning requires an assessment of their educational content, the technical design of educational techniques and e-activities, as well as the level of access, availability and utilization.

In this regard, Al-Ahliyya Amman University (AAU) has been giving a great attention since more than ten years to e-learning and its utilization in teaching some courses, based on its belief in its role in developing education in general, improving its outputs, and being an essential factor for achieving success of open education to achieve its desired goals. AAU developed an integrated plan to support some courses, namely: "Communication Skills in Arabic Language level 1, Computer Skills, the remedial course for Arabic and the course of National Education" and as a new approach based on self e- learning that depends on the learners' self management of the learning process.

This course was applied in its new style, for the first time in the summer semester of the academic year 2017/2018.It was also designed and developed by a team of experts in educational, technical and scientific content design, based on the principles and bases of e-learning and self-learning, and presented to the learners through various sources and alternatives such as: CDs, website, mobile, tablets. In addition, it provides a full range of paper an electronic support and orientation techniques to ensure the successful implementation of these courses. Consequently this study aims to evaluate the curricula based on the e-learning style in terms of their educational content, technical design, and the level of availability, accessibility and the courses utilization and their e-activities seeking to enhance the experience of self-learning e-courses at Al-Ahliyya Amman University.

1.1. Problem and Questions of the Study

Taking into consideration the significance of e-learning and e-courses as a model that has achieved an outstanding progress at global and local levels, Al-Ahliyya Amman University (AAU) started to apply the self-learning approach on four compulsory courses offered by the university at the first academic year on the basis of (12) credit hours for the first time in the summer semester of the academic year 2017/2018. It targets all learners in their various faculties and specialties, and incorporates verity of topics, concepts, learners' basic theoretical and practical skills from the moment of their enrollment at the university, during the study years and even after graduation.

AAU aims at keeping pace with the development requirements, diversifying the university education opportunities, achieving education for all and life-long learning, and empowering learners to interact with all types of educational materials such as texts, pictures, short films and self-assessment questions and answers. As a result, learners can learn by themselves without the need to attend lectures and at the same time maintain required support and assistance from the university staff members.

The researchers conducted a pilot study to determine the degree of evaluating self e-learning courses (through the web) for some university courses, including the course of communication skills in Arabic language 1, computer skills, the remedial course of Arabic and the course of National Education. The study revealed that there was a type of deficiency in designing these courses, especially as they are considered the first of their kind in the university, including: the lack of actual or tangible interaction in the e-learning courses from the learners, the inadequacy of these systems to the educational and the individual needs of the learners, the lack of utilizing simultaneous and asynchronous communication tools in a way that boosts interaction among learners, the poor design of some pages, and the grammatical and spelling mistakes.

The results of the survey are consistent with the results of some previous studies of Hsu *et al.* (2009), Hussin *et al.* (2009), Moller *et al.* (2008), More and Pinhey (2016), Vovides *et al.* (2007), Zaharias and Poulymena (2008), which revealed that it is imperative to pay attention to the educational design of e-courses besides taking into account the requirements of pedagogy science, as well as following the global trend towards quality assurance in this type of learning. The problem of this research is represented in the absence of standards that monitor and manage the

process of evaluating self e-learning courses at Al-Ahliyya Amman University and how to address it in a way that ensures quality assurance. In light of this discussion, the problem of the study can be identified in the following questions:

1. What is the evaluation degree of the self e-learning based courses from the perspective of the learners as well as the academic staff members at AAU?

2. Are there any statistically significant differences at the level of statistical significance $(0.05 = \alpha)$ in the evaluation degree of the self e-learning based courses from the viewpoints of the learners and the academic staff members at AAU approach according to the variables of: profession, gender, faculty and course?

1.2. Objective of the Study

The purpose of the study is to identify the degree of Al-Ahliyya Amman University (AAU) learners' and academic staff members' evaluation of self e-learning- based courses in terms of their educational content, the technical design of electronic techniques, activities, availability and accessibility, Moreover, the research paper aims to address obstacles facing this evaluation in line of some variables including: profession, gender, faculty and course.

1.3. Significance of the Study

The significance of this study involves the following:

1. Theoretical significance: The theoretical significance of this study is related to enriching the Arabic library with new information, which represents an important reference for academics, researchers and experts in the e - learning, and evaluating of courses based on the style of self e – learning. The study can also be a beginning for other studies in the same field, besides enabling the teaching learning process to develop an effective and flexible technical educational environment, which meets the requirements of the modern era in university education.

2. Practical significance: The practical significance of this study represents the following:

- Evaluating the educational content, technical design of electronic techniques and activities and the level of the availability and accessibility of self e-learning-based courses from the perspective of both learners and academic staff members.

- Focusing on e-learning and giving recommendations and proposals to decision-makers at the university to promote investment of modern technology and develop educational outputs in line with the requirements of development and measures that suit the nature of the Jordanian society and its needs. Such actions are taken in accordance with the goals set by the Ministry of Higher Education on one hand and the educational development plans on the other hand, to create an effective technical educational environment, which meets the requirements of the new approach applied in Jordanian universities.

1.3. Limitations of the Study

This study was limited to learners and academic staff members in scientific and faculties of humanities at AAU /Jordan who were registered in the summer course of the academic year 2017/2018.

2. Literature Review

2.1. Concept of E-Learning and its Advantages

European Commission (2001) describes e-learning as the utilization of modern multi-media technologies and the Internet to enhance the quality of education by facilitating the process of dealing with knowledge sources (Qashmar, 2017). An extensive definition given by Abbad *et al.* (2009) defined e-learning as any e-enabled education, besides using ICT to provide facile access to online learning / teaching resources.

It is also describes as the utilization of new multi-media technologies and the Internet to upgrade the learning quality, support the educational process and shifting it from the phase of traditional lectures to an interactive system presented to learners through information communication and digital technology Al-rahmi *et al.* (2015b).

E-learning has positive effects in the educational domain, as it bridges the digital gap between the current curricula and modern technology and provides education for all and everywhere, according to a study made by Malik (2010). It also enriches the learning process by the illustrative effects which engage all senses to make learning more gorgeous, enjoyable and effective for learners (Lu and Chiou, 2010). Additionally, e-learning is an attractive and exciting means of learning because it adopts a set of illustrations and interactive simulations (audio-visual techniques) and multimedia used to teach courses electronically to achieve self education type (Itmazi, 2015). Furthermore, e-learning offers learners and teachers the opportunity to interact with each other in a virtual environment. It differs from traditional methods of learning (Al-Dhalan, 2017), such as classrooms and lectures. With this type of learning, learners attend home-based lectures and manage their time based on their needs and preferences (Ehlers and Pawlowski, 2006).

Arkorful and Abaidoo (2014), also discussed that e-learning creates an interactive learning environment through new and diverse electronic technologies dealing with information sources and expertise, and provides learners with the technical skills. It also supports interaction between teachers and learners by exchanging educational expertise through diverse communication channels such as the e-mail, live chat rooms and virtual classrooms (Al-adwan and Smedly, 2012). According to Algahtani (2011) and Al-Guthami (2019) e-learning depends on the learners' effort to learn by them selves (self-learning) and enhances collaborative learning among learners. The researcher (Hattabi,

2019; Liu and Wang, 2009; Tagoe, 2012) argues that e-learning motivates the learners' lifelong learning without abiding to a specific age.

2.2. Self E-Learning based Courses and their Advantages

The concept of the e-learning courses was introduced due to the importance of the curricula evaluation and its role in upgrading and orienting the educational process and the need to adopt e-learning approach in the last few years (Sorokina *et al.*, 2002). Clark and Mayer (2011) argued that self-learning-based courses are a direct application of the concept of e-learning, since all activities and materials of these courses are designed on the internet and LMS network according to certain standards related to applying the e-learning management systems (Almogren, 2019).

Hennawi (2017), defined e-learning as a model of learning based on learners' self interaction with e-learning material through electronic techniques, and technological alternatives that have been developed to help them acquire knowledge and skills, and achieve the desired educational goals. So learners can learn by themselves and shoulder the responsibility for their learning with the needed guidance and support from teachers (Masoudi, 2018).

Hassanzadeh *et al.* (2012), indicated that this educational model and its strategies have evolved with the development of learning mechanisms, so it has become a fundamental pillar in teaching/learning policies of the higher education institutions, and a key factor for their success (Alanzi, 2018). De Bruin (2007), argued that the most important advantage of self e-courses is that they provide easy access to the network additional services and facilities such as accessibility to forums, blogs, e-mail, chat rooms, and chat programs. Moreover they provide learners with adequate learning that suits their abilities and special needs (Jou and Wu, 2012) and enables students to master basic skills and take the initiative to learn, especially in the university education, compared to learners who learn by traditional methods that negatively affect their interest in learning, (Chen and Emily, 2005).

2.3. Criteria for Assessing and Designing Self E-Learning based Courses

A good educational design is considered the key element for e-learning courses and there are certain criteria to be taken into account in evaluating these courses, such as content, learning methodologies, interactive design, and multimedia applications (Tung, 2003). Mills *et al.* (2009), added that there are other standards to promote meaningful learning, integration of cognitive skills, effective management of online learning, exchanging life experience among learners, quality of the learning content, technical design of e-activities, accessibility and availability (Hassanzadeh *et al.*, 2012).

However, Swansea University (2007) indicated that there were other criteria such as: reference standard, content quality, designing the interaction interface, providing feedback, supporting navigation, boosting visual design and easy access. Brown and Voltz (2005), Al Sa'eedi (2011) added the criteria of multi-media design, learning activities, scenario, and feedback, delivery of courses, context, impact and effect. On his part (Lui, 2001) mentioned other criteria, for instance: objectivity, integrity, access to searching engines, educational content, and pedagogy. Moller *et al.* (2008), added the criteria of interaction, monitoring, accuracy and security, while debated that there were other criteria such as modernity of the course content and the cost.

2.4. Previous Studies

Al-Rahmi *et al.* (2018), conducted a study to identify the degree of e-learning utilization by learners of the University of Technology Malaysia, and to determine the impact of the design of e-learning courses on the level of satisfaction and acceptance of the learners towards e-learning. The study was based on the descriptive approach based on a questionnaire distributed among a randomly selected sample comprising (160) learners. The study revealed that the degree of students' satisfaction with e-learning was high and that the design of these courses complies with the international standards and specifications, and thus, there was a positive impact of the students' desire and willingness to adopt e-learning approach.

Hennawi (2017), conducted a study to evaluate the course "Learn how to learn" based on self-e-learning approach from the viewpoint of the course learners and coordinators at Al-Quds Open University. The researcher applied the descriptive method, using a questionnaire distributed among a random sample of (623) respondents. The results of the study indicated that the degree of the learners and coordinators' evaluation of the self-e-learning curricula ranged between high and very high in the field of educational and technical design, design, self-e-learning, support and counseling. There were no statistically significant differences in the evaluation degree of e-learning students and coordinators. The most important design criteria of e-courses were: the educational content, technical design, self-e-learning, support and counseling.

Awadh *et al.* (2017), also conducted a study to evaluate e-learning courses at Al-Quds Open University from the viewpoint of staff members and students. The researchers applied the analytical descriptive method, using a questionnaire distributed among a random sample of (1067) students and (20) staff members. The results indicated that the degree of the learners and staff members' evaluation of the self-e-learning courses was very high.Moreover; there were no significant differences in the evaluation degree of these courses betweeen learners and staff members according to the variables of sex, faculty, grade, and academic branch or major. The most important design criteria of e-courses were: easy access and navigation, organization, order, taking into account the learners' needs, interactive services, links, credibility, modernity, objective coverage, accuracy, security and privacy.

Salloum *et al.* (2015), made a study to identify the status of e-learning in Mu'tah University from the perspective of the students. The descriptive analytical method was used, where a questionnaire was distributed among a randomly selected sample of (335) students. The results found that the average estimates of the sample of

the study on the benefits of e-learning courses (related to pros, cons, and obstacles) were high. It also revealed that there were statistically significant differences between the average estimates of the sample of the study on the adoption of e-learning, and its pros and cons. Nonetheless, the study did not reveal any statistical differences related to the domain of obstacles.

Hassanzadeh *et al.* (2012), made a study seeking to provide a model to measure the success of e-learning systems in universities, and identify the major standards of e-courses educational design in five universities: Prince Kabir University, Tehran University, and Shahid Beheshti University, the University of Iran for Science and Technology and Khaji Naser Tousi University for Technology. The study adopted the analytical descriptive method, where a questionnaire was randomly distributed among a sample of (369) students and (33) trainers. The researchers recommended taking into account some issues concerning the nature of the e-courses educational design, especially those relating to pedagogy, good educational content, ability to retrieve the educational content, technical design, easy access and navigation, organization, order, credibility, modernity, objective coverage, accuracy, security and privacy.

3. Methodology and Procedures

The methodology can be clarified by the following sub-titles:

Methodology of the study: The analytical descriptive approach was applied because it complies with the study questions and objectives.

Population of the study: The study population was composed of all learners enrolled in the courses (Communication Skills 1/ in Arabic, Computer Skills, Arabic Language/remedial course and National Education) .The academic staff members were selected as coordinators for the courses, in the summer semester of the academic year 2017/2018 in different scientific and faculties of humanities at AAU.

Sample of the study: The sample of the study consisted of (353) learners who were selected by a simple random methodology involving learners taking the self e-learning- based courses. Five members were selected from the academic staff as coordinators of these courses (358) questionnaires were analyzed. Table 1 shows the classification of the study components according to its variables.

Table-1. Characteristics of study sample members categorized by the variables of: profession, gender, faculty and course

Variable	Type of variable	Number	Percentage %
Profession	Academic staff member	5	1.4
	Student	353	98.6
Gender	Male	216	60.3
	Female	142	39.7
Faculty	Scientific	284	79.3
	Humanities	74	20.7
Course	Communication skills/ Arabic language	84	23.5
	Computer skills	90	25.1
	Arabic Language/remedial course	31	8.7
	National Education	153	42.7

The table shows that the majority of the sample was at a percentage of (98.6%), with (60.3) for males, and the percentage of scientific faculties was (79.3%) while for the National Education the percentage was(42.7%).

3.1. Instrument

A questionnaire was administered to collect the required information for the study, as it was the case for the studies conducted by Hennawi (2017) and Awadh *et al.* (2017) in addition to the researchers' experience in this domain. The questionnaire includes two parts: the first part deals with collecting personal demographic data such as gender, faculty and the self e-learning based course. The second part is divided into three domains including:

1- Evaluation of the educational content of the self e-learning based courses and this consisted of (15) item.
2- Evaluation of the technical design of the electronic techniques and activities for self e-learning based courses, and it contained (14) items.
3- Assessment of the level of availability and accessibility to self e-learning based courses, and it consisted of (10) items.

The domains' items were designed according to the five-dimensional Likert scale, which included the following degrees/levels of implementation: (5) strongly agree, (4) agree, (3) neutral, (2) disagree, and (1) strongly disagree. The study also applied the following levels to measure the degree of evaluation of the self e-learning based curricula from the viewpoints of the learners and the academic staff members at AAU, The levels were: 3.68-5 high, 2.34-3.67 moderate, and weak /very low 1-2.33.

3.2. Validity and Reliability of the Questionnaire

To confirm the validity of the questionnaire, the initial form (including 55 items) of the study was submitted to a validation committee consisting of ten specialized academic staff members who have a wide experience in the fields of curricula, pedagogy and education technology. The committee members were asked to check the clarity of the items and their validity to measure the designated purpose of the study, its relevance to the study objectives and the

integrity of the language structure. Their remarks were taken into consideration. A percentage of 80% or more was approved for the items as evidence of their validity, and the tool was revised in light of the committees' suggestions, by paraphrasing the content/language of some paragraphs and modifying them to come up with the final form of the items to be (39 items).

To help confirming the reliability of the questionnaire, the Scott coefficient was calculated by applying the Cronbach Alpha equation. The consistency coefficient for all items of the tool (Alpha = 0.96) which was a high and acceptable consistency rate for the purposes of the study.

3.3. Procedures of the Study

The University presidency gave the researchers its formal approval of the study to facilitate their mission, after confirming the reliability and the validity of the study and identifying the targeted group. The questionnaire was electronically distributed for the sample, the objectives of the study were clarified and the recipients were given enough time to provide their answers. The data were entered into the computer and processed statistically, analyzed and discussed, and then the appropriate recommendations were concluded.

3.4. Statistical Analysis

The means and the standard deviations were calculated to answer the first questions. In order to answer the second question of whether there were any statistically significant differences at (α = 0.05) between the means of the study members, that can be attributed to the variables of the profession, gender and faculty, T-test was used for two independent samples. In addition, ANOVA analysis was used to determine if there were any statistically significant differences (α = 0.05) between the means of the study sample that were due to the variable of the course.

4. Findings and Discussion

Findings and discussion of question No.1: What is the evaluation degree of the self e-learning based courses from the perspective of the learners as well as the academic staff members at AAU?

The researcher answered this question by calculating the means, the standard deviations and discussing learners' and academic staff members' estimates of the self e-learning based courses. These findings include learners' and staff evaluation of the three previously mentioned domains with the total degree of each domain. The following discussion focuses on these findings:

4.1. Evaluation of the Educational Content

To answer this question, the means and standard deviations of items relating to the evaluation degree/rate of the educational content from the perspective of learners and academic staff members were calculated, and Table 2 explains this.

Table-2. Means and standard deviations of items relating to the evaluation degree of the educational content, from the perspective of learners and academic staff members

No.	Item	Mean	Sd	Level
3	Each educational unit starts with an introduction that clarifies its aims and issues to be discussed.	3.88	1.07	H
1	Units are divided into lessons and parts that help to understand the topics easily.	3.85	1.12	H
4	There is logical and organized sequence of the learning steps.	3.82	1.08	H
8	Units include classified lists of topics, titles and references related to the course content.	3.77	1.07	H
7	Illustrative models can be increased when the course content and topic require such action.	3.75	1.12	H
2	The course contains up-to-date information and skills that are useful for learners' practical life.	3.70	1.15	H
9	The content tackles all topics related to the course equally.	3.68	1.16	H
5	The course provides direct feedback for evaluation processes and helps to improve learners' learning.	3.66	1.16	M
14	The course includes evaluation methods that help learners in the self-learning assessment process.	3.64	1.23	M
6	Electronic course takes into account individual differences among learners through: models, different questions and sequence in presenting the content themes.	3.60	1.18	M
15	The course is enclosed with an instruction guide to help learners learn by themselves.	3.60	1.23	M
13	The course boosts learners' self-confidence and their ability to organize the learning process and follow up their study.	3.54	1.34	M
11	The end of every unit/module includes a summary.	3.54	1.31	M
10	The educational content is supported by links for other websites to cover the topics more deeply.	3.52	1.22	M
12	The course stimulates the previous knowledge required to start the new learning phase.	3.50	1.23	M
	Total degree/rate	**3.66**	**0.92**	**M**
	SD: Standard Deviation H: High M: Moderate			

Table 2 Shows that the responses of the sample members ranged from (3.50 to 3.88), and the total score was moderate, with a mean of 3.66 and a standard deviation of (0.92). This shows that learners are satisfied with e-learning approach, and highlights its importance and positive effect on the educational process. The results also reflect the awareness of the academic staff members of the significance of this type of e-learning.

Item (3),"*Each educational unit starts with an introduction that clarifies its aims and issues to be discussed*", has scored the first rank with a mean of (3.88) with a high level of agreement. This result indicates that the viewpoints of learners and academic staff members are identical regarding the evaluation degree of the educational content.

The researchers stress that the curriculum is the core of a successful course, since any successful curriculum is based on an organized and effective educational content, and as well the organized content is the center of any successful educational program, especially in e-learning programs. This is consistent with the findings of a study made by Hassanzadeh *et al.* (2012), Hussin *et al.* (2009), who stressed that, in general, the basis of educational design for e-learning programs constitutes a turning point in the design of the program from just being a computerized program into an educational program that achieves specific educational goals by the coordinators of the educational subjects/courses.

Item 12, which states that "*the course stimulates the previous knowledge required to start the new learning process*" has registered the last rank with a mean of (3.50) and moderate level of agreement. This is due to the fact that the design of the courses allowed the learners to have an integrated idea of the educational content of the course, which helped to fully control the idea and topics of the course and their branches. This facilitated the process of retaining and quick remembering of the previous information and knowledge.

Argued that Mills *et al.* (2009), Zaharias and Poulymena (2008), Lui (2001) the educational /subject and content can be presented in a single interface, and the learners have an easy access to the educational content. The learning process can be repeated for more than once and as much as learners need without feeling embarrassed, and they can easily browse any site needed during the learning process. Thus, it will be easier to remember and recall previous information and relate it to the new information. This discussion also agrees with a study conducted by Abu-Khatwa (2011), who debated that we have access to the educational content of e-learning courses at any time and everywhere. Moreover, we can examine their topics, classification, categories, availability and utilization and update and amend their content easily and simply.

4.2. Evaluation of Technical Design of Electronic Techniques and Activities

In order to answer this question, means and standard deviations of items related to the evaluation degree of the technical design of electronic techniques and activities, from the perspective of learners and academic staff members were calculated. Table 3 clarifies this.

Table-3. Means and standard deviations of items relating to the evaluation degree of the technical design of electronic techniques and activities, from the perspective of learners and academic staff members were calculated

No.	Item	Mean	SD	Level
22	The course technical design attracts learners and motivates them to learn.	3.89	1.12	H
20	The course technical design is exciting and interesting for learners.	3.88	1.13	H
16	Various learning techniques including texts, videos, explanatory images and shapes represent suitable links that help learners examine the course material deeply.	3.87	1.13	H
26	Spaces are made between items and paragraphs to facilitate the process of reading.	3.84	1.16	H
17	Size of drawings, shapes and images is clear and suitable.	3.83	1.10	H
18	Size and type of font are suitable and can be easily read.	3.83	1.20	H
25	The university slogan and names of courses and lecturers can be easily seen.	3.82	1.16	H
21	Colors used in interface design, font and backgrounds/wallpapers are suitable.	3.81	1.13	H
28	Images, texts and colors of pages have balanced design.	3.79	1.16	H
29	Design is relevant to the course topics and content.	3.78	1.14	H
23	The course enables learners to browse its modules easily and freely.	3.75	1.16	H
24	All modules contents are presented organized and formulated in a coherent manner.	3.70	1.16	H
27	The font of main titles of topics is bold and very clear.	3.62	1.16	M
19	There is an easy access to the course material to browse its interface and find options.	3.54	1.13	M
Total degree		**3.78**	**0.94**	**H**
SD: Standard Deviation	H: High	M: Moderate		

Table 3 shows that the responses on this question ranged from (3.89) to (3.54), and the total score was moderate, with a mean of (3.78) and a standard deviation of (0.94), despite similarity in the evaluation means. However, the domain of technical design of electronic techniques and activities got the highest score among other evaluation

domains, according to the viewpoints of learners and coordinators from the academic staff members. The researchers may attribute this result to the fact that there was a vigilant, keen, technical planning, development, design and implementation of the courses supported by following up from the university administration and the academic staff. Moreover, the course components, activities and structure were well-prepared under the supervision of a team of highly experienced and qualified educational experts.This is added to providing all means of support, counseling and guidance during the implementation process.

Item (22) "*The course technical design attracts learners and motivates them to learn*", has come in the first rank with a mean of (3.89) and a high level of agreement. This is due to the variety in multi-media included in the electronic textbook /Html (with texts, images, sound effects and links for videos). The educational content of electronic textbooks was presented by a sequence of topics that show visual effects, and this attracts learners' attention by using many senses in the learning process, such approach was not applied in traditional style textbooks or electronic textbooks based on .pdf style. This also indicates that the members of the study sample feel comfortable when implementing the course activities as they have easy access to its content and attractive design besides facile browsing of various files and sites. Additionally, some learners find the e-learning approach more comfortable and motivating since they do not learn through face-to-face (direct) communication with teachers and are not obliged to attend lectures at a certain time, abide to attendance and absence rules, and browse the topics they like to learn about or the issues they find unsuitable or unnecessary.

Furthermore, some academic staff members think that that e-learning approach reduced the pressure they had to bear in teaching learners through office hours. Some of them also expressed their confidence in the integrity of e-learning tests, and said that they have overcome the difficulty of spending long hours in correcting paper tests (hardware) and calculating learners' final marks.

Item (19),"*There is easy access to the course material and browsing its interface and options*" ,has come in the last rank with a mean of (3.54) and a moderate level of agreement. This might be explained by the fact that e-learning based courses give learners the opportunity to control the learning process by selecting the topics needed by learners and academic staff members. In addition, the educational material and the content are presented through one interface which helps learners to surf any topic easily. Moreover, the interface covers too many links and related websites that enable learners and lecturers to browse their pages, search, save and print the information they are looking for.

These results are consistent with the argument of, Lui (2001), Zaharias and Poulymena (2008) and the study of Zaharias and Poulymena (2008) who confirmed that the technical design of the user interface (organization of the web page, interactive design and the impact of multi-media) are key factors that help improve performance outputs, enhance learners' stimulus and boost students' learning abilities. Furthermore, a study of Brown and Voltz (2005) revealed that e-learning enriches education by including illustrative effects and introducing unique programs that engage all senses to make the teaching/learning process more enjoyable, exciting and effective in the development of students' higher mental skills.

4.3. Evaluation of Availability and Accessibility

In order to answer this question, the means and standard deviations of items related to the evaluation degree of availability and accessibility, from the perspective of learners and academic staff members were calculated. Table 4 explains this in details.

Table-4. Means and standard deviations of items relating to the evaluation degree of availability and accessibility, from the perspective of learners and academic staff members at AAU

No.	Item	Mean	SD	Level
33	Learners can learn the course at any time and everywhere according to their desires.	3.93	1.11	H
39	Pages have titles that describe the content accurately and clearly.	3.89	1.06	H
36	The course makes it easy to communicate and answer learners' inquiries by e-mail.	3.82	1.10	H
30	Quick surfing from former pages to the next content.	3.81	1.18	H
38	Every page has a link that helps users move to the main/home page.	3.79	1.14	H
35	The course material can be sent by e-mail.	3.77	1.08	H
34	There are available instructions and clear written guidelines to look at the pages easily.	3.76	1.09	H
32	Links are activated to help learners browse pages and find the sites correctly.	3.71	1.15	H
37	The course can be found through different search browsers such as: Google Chrome, Mozilla, and Internet Explorer.	3.61	1.16	M
31	There is an option for common questions FAQ to answer some inquiries.	3.60	1.12	M
Total degree		**3.76**	**0.90**	H
SD: Standard Deviation	H: High		M: Moderate	

Table 4 shows that the responses of the study sample members on the items of this question ranged from (3.93) to (3.60), and the total score was high, with a mean of (3.76) and a standard deviation of (0.90).This indicates that

there are high quality standards for the availability and supportive services for e-learning based courses. Researchers may ascribe this to the fact that there is a strong belief to apply this approach and technique at any time and everywhere, inside and outside the university campus.

Item (33), "Learners can learn the course at any time and everywhere according to their desires", has scored the first rank with a mean of (3.93). These results show that the respondents have a strong belief in the efficiency of such approach which helps learners to depend completely on themselves by selecting the sources of information without any intervention from others. Learners can also select the kind of information and experience they need at an appropriate time and speed without being obliged to follow a specific timetable for lectures. Moreover, it is easy to distribute the electronic textbook after preparation and programming its material and then delivering it to the learners.

Item (31), "There is an option for common questions (FAQ) to answer some inquiries", has scored the lowest rank with a mean of (3.60) and a moderate rate. The researchers argued that the evaluation of this item at a moderate rate might be due to the fact that the common questions' option (FAQ) requires high behavioral skills and competences, and that learners communicate with their teachers by e-mail to get answers for their inquiries.

Findings and discussion of question No.2. Are there any statistically significant differences at the level of statistical significance $(0.05 = \alpha)$ in the evaluation degree of the self e-learning based courses from the viewpoints of the learners and the academic staff members at AAU according to the variables of: profession, gender, faculty and course?

To answer this question, the mean and standard deviations were calculated for the evaluation degree of self e-learning based courses according to the study variables. T-test was used to find the differences according to the profession variable (academic staff member, student), gender (male / female, and the faculty (scientific/humanities). One way ANOVA analysis was applied to determine the significance of the statistical differences in the evaluation degree of self e-learning based courses, and in accordance with the variable of the course (Communication Skills/ Arabic Language 1, Computer skills, Arabic Language/remedial, and National Education).

4.4. Findings Related to the Variables of Profession, Gender and Faculty

Table 5 shows the findings of t-test for statistically significant differences between the means of the responses of the study sample members to the evaluation degree of self e-learning based courses at the level of $(0.05 = \alpha)$ according to the variables of profession, gender and faculty.

Table-5. Means, standard deviations and the results of T- test of the statistically significant differences of the total degree of the study domains by the variables of (profession, gender and faculty)

Variable		No.	Mean	SD	T-value	FD	Level
Profession	Academic staff	5	4.20	0.40	1.723	356	0.086
	Student	353	3.62	0.74			
Gender	Male	216	3.62	0.75	-0.401	356	0.689
	Female	142	3.65	0.72			
Faculty	Scientific	284	3.66	0.71	1.399	356	0.163
	Humanities	74	3.53	0.83			
SD: Standard Deviation			FD: Freedom Degree				

The results in Table 5 reveal that there were no statistically significant differences at the level of significance (α = 0.05) between the means of the responses due to the profession variable, based on the calculated (t) value , with a total value of (1.723) and a significance of (0.086). This means that the views of the coordinators from the academic staff members agree with the learners' viewpoints that the courses are characterized by their ability to realize the concept of e-learning, and that student and the staff members have similar opinions regarding the use of e-learning approach in teaching. This may be due to the fact that e-learning is not influenced by the type of the profession of the user, whether he/she is a student or an academic staff member, since it is available to all users and at the same level without any interference from the beneficiaries from such courses, either learners or academic staff members.

The reason for the absence of statistical differences in the experience of researchers (as coordinators for the courses) is that most of the learners are satisfied with e-learning approach which is not controlled by attendance and absence rules. In addition, they are not obliged to study in order to get participation marks in the class or prepare worksheets, especially if this task is related to subjects selected as requirements from the university and not majors. These courses are based on memorizing without using other mental/cognitive skills, and this is considered the negative aspect of the traditional learning approach that should be abandoned. The result of this study is compatible with the results of Hennawi (2017) and Awadh *et al.* (2017).

The results showed that there were no statistically significant differences at (α = 0.05) among the means of the responses of the study sample according to gender variable, based on (t) value and a total rate of (-0.401) and a significance level of (0.689). This finding may be logical, as the educational content and its technical design and implementation are not biased to gender of the recipients. They are available to both genders at all times and provide services for both in the same way and at the same level, and this was reflected in the nearly similar evaluation or rating of females and males. Researchers also attribute this to the nature of electronic activities and tasks, as there are no activities or components of the models that that are restricted to any gender, since they suit both sexes (males and females). Furthermore, males and females enrolled in the university have previous experience in using the computer,

equal access to the academic portal; in addition they can easily communicate with the coordinators through e-mail. All these reasons were behind the slight differences in the means. This result is consistent with the results of the studies of Hennawi (2017) and Awadh *et al.* (2017).

They also indicated that there were no statistically significant differences ($\alpha = 0.05$) among the means of the responses of the study sample according to the faculty variable, based on the (t) value with a total rate of (1.399) and a significance of (0.163). This may be due to the fact that scientific and faculties of humanities at AAU have similar conditions, and have similar potentials in terms of equipment, laboratories and modern devices that are required for e-learning in all university faculties. The University provides required techniques in all faculties regardless of the courses they teach or their specialties, so learners' and academic staff assessment is often identical. This result goes side by side with those of Hennawi (2017) and Awadh *et al.* (2017).

4.5. Findings Related to the Course Variable

ANOVA analysis was applied to determine the differences between various levels of the course variable. The mean of the response scores in this field showed that there were apparent differences between the course variable levels as shown in Table 6.

Table-6. Means and standard deviations on the total degree of the study domains by the course variable

Variable		No.	Mean	SD
Course	Communication skills/Arabic language	84	3.61	0.85
	Computer skills	90	3.65	0.56
	Arabic Language/remedial course	31	3.67	0.88
	National Education	153	3.63	0.74
SD: Standard Deviation				

Table 6 shows that there were statistical differences between the means of the responses of the study sample due to the variable of the course. ANOVA analysis was applied to ensure that there were statistically significant differences between the means of the assessment of self e-learning based courses according to the course variable. Table (7) illustrates the results of the test.

Table-7. Analysis of differences among means of the total degree of study domains by the course variable

Total of squares		df	Mean of squares	F	Significance F
Among groups	0.123	3	0.041	0.074	0.974
Inside groups	196.417	354	0.555		
Total	196.540	357			

The results in Table 7 indicated that there were no statistically significant differences at ($\alpha = 0.05$) among the means of the responses of the study sample and the degree of evaluation of the self e-learning based courses according to the course variable based on (f) value at (0.074), with a significance level (0.974) for the total score. Researchers may attribute this to the fact that the nature of the subjects and the courses (the sample of the study) are a bit similar, and that they are often designed by an experienced special committee from the university according the same criteria. Therefore, the assessment of the learners and the academic staff members did not differ even when the courses were different. Also, there were no statistical differences because the e-learning model was applied on university requirements, which means that they require less effort compared to specialty subjects, and this explains why the results were the same. This result duplicates those of Hennawi (2017).

5. Conclusion

This study supports the argument that e-learning courses are key elements for the development of the university educational level in Jordan and boost its position in the world relating to the technological development. Al-Ahliyya Amman University supports electronic platforms that are capable of sharing all learning resources, providing easy access to interactive materials, discussion forums, chat rooms, educational games, and carrying out educational activities such activities include: assignments and quizzes to enhance the learning experience in self e-learning at Al-Ahliyya Amman University. Moreover, the study reiterates that the success of e-learning depends on the good and quality level of e-learning factors and the interrelated elements so as to achieve the desired goals. The researchers argue that it is imperative to support the policy to include e-learning in university courses and identify areas of weaknesses and strengths, then correct and assess all errors in every e-course which does not achieve its desired objectives.

Recommendations

In light of the results, the study came up with the following recommendations:

1- It is recommended to raise the awareness of staff members and boost their motivation level towards self e-learning courses through seminars, workshops and training courses so that these efforts will be reflected on their performance in the design of distance e-learning courses.

2- Urge staff members who teach these courses to participate in international, Arab and local conferences in the field of e-learning to develop their abilities and to benefit from the experiences of their counterparts in this field.

3- The orientation of the higher education institutions that provide e-learning and distance education programs is a must as they have to pay more attention to the development of quality standards of distance learning, especially in light of the growing competition among universities in the provision of services (applications) of this type of education.

4- It is imperative to apply quality standards in evaluating and designing e-learning courses, follow up and monitor their implementation regularly since these requirements are   essential towards achieving excellence and quality outputs of educational programs that adopt electronic learning, either in certain courses or in all e-learning courses.

References

Abbad, M., Morris, D., Al-Ayyoub, A. and Abbad, J. M. (2009). Students' decisions to use an elearning system: a structural equation modelling analysis. *International Journal of Emerging Technologies in Learning,* 4(4): 4-13.

Abu-Khatwa, A., 2011. "Quality assurance criteria e-courses design and production." In *discussion paper presented at the second International Conference on e-Learning and Distance Learning, held at the National Center for e-Learning and Distance Education, King Sa'oud University, February 21-23, February 2011.*

Afifi, M., Al Omari, S. and Zeidan, S. (2016). Development of e-courses quality educational design criteria at adammam university. *Journal of Educational Sciences Studies,* 43(1): 157-73.

Ahmed, H. and Sa'eed, F. (2014). Evaluation of e-courses in sudan open university in light of e-courses quality criteria. *Palestinian Journal for Open Education and E-Learning,* 4(8): 87-126.

Al-adwan, A. and Smedly, J. (2012). Implementing e-learning in the jordanian higher education system: Factors affecting impact. *International Journal of Education and Development using Information and Communication Technology,* 8(1): 121-35.

Al-Dhalan, I. (2017). The effect of using google apps for education to develop the skills of e-tests design for the student of the educational diploma in "computer in education "course. *International Specialized Educational Magazine,* 6(3): 48-61.

Al-Guthami, N. (2019). The impact of the interaction between an e-learning environment and thelevel of susceptibility for self-learning on critical thinking and achievement in mathematics among high school students. *Journal of Educational and Psychological Sciences, Arab Journal of Science and Research Dissemination,* 3(6): 91-123.

Al-rahmi, W., Othman, M. and Yusuf, L. (2015a). Exploring the factors that affect student satisfaction through using e-learning in Malaysian higher education institutions. *Mediterranean Journal of Social Sciences,* 6(4): 299-310.

Al-rahmi, W., Othman, M. and Yusuf, L. (2015b). The effectiveness of using e-learning in malaysian higher education: A case study universiti teknologi Malaysia. *Mediterranean Journal of Social Sciences,* 6(5): 625-37.

Al-Rahmi, W., Alias, N., Othman, M., Alzahrani, A., Lfarraj, O., Saged, A. and Rahman, N. (2018). Use of e-learning by university learners in malaysian higher educational institutions: A case in universiti teknologi Malaysia. *IEEE Access,* 6: 14268–76. Available: https://ieeexplore.ieee.org/document/8283693

Al Sa'eedi, O. (2011). Required criteria for assessment of e-courses content in distance learning, from perspective of experts and specialists. *Journal of Modern Education Association,* 4(1): 171-221.

Alanzi, I. (2018). The effect of using inverted learning in developing the skills of producing e-courses for students of the college of education at the public authority for applied education in Kuwait. *Journal of Educational Sciences,* 26(2): 230-65.

Algahtani, A. F. (2011). *Evaluating the effectiveness of the e-learning experience in some universities in Saudi Arabia from male learners' perceptions.* Durham theses, Durham University.

Almogren, N. (2019). The effect of e-learning by using the learning management system Edmodo on the achievement of the students of first secondary grade in the curriculum of computer and information technology and their attitudes towards technology. *International Specialized Educational Magazine,* 8(1): 118-36.

Amado-Salvatierra, H. R., Hilera, J., Tortosa, S., Rizzardini, R. and Piedra, N. (2016). Towards a semantic definition of a framework to implement accessible e-learning projects. *Journal of Universal Computer Science,* 22(7): 921-42.

Arkorful, V. and Abaidoo, N. (2014). The role of e-learning, the advantages and disadvantages of its adoption in higher education. *International Journal of Education and Research,* 2(12): 397-410.

Awadh, H., Al Abed, S., Affounah, N., Abu Ramees, I., Alqam, S., Kheryoush, A., Al Agha, N., Ghanem, B., Al Athamnah , Z. and Haneni , Z. (2017). Evaluation of self e-learning based courses in al quds open university from the perspective of academic staff and learners. *Palestinian Journal for Open Education and E-Learning,* 6(11): 1-66.

Brown, R. and Voltz, D. (2005). Elements of effective E-Learning design. *International Review of Research in Open and Distance Learning,* 6(1): 1-7.

Chen, C. and Emily, F. (2005). Experience –based language learning through asynchronous discussion ،eric, no: Ed 490012. Available: https://eric.ed.gov/?id=ED490012

Clark, R. and Mayer, R. (2011). *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning.* John Wiley and Sons, Inc: New Jersey.

Dabbagh, N. and Kitsantas, A. (2004). Supporting self-regulation in student-centered web-based learning environments. *International Journal on E-Learning,* 3(1): 40-47.

De Bruin, K. (2007). The relationship between personality trails and self-directed learning readiness in higher education learners. *South African Journal of Higher Education,* 21(2): 228-40.

Ehlers, U. D. and Pawlowski, J. M. (2006). *Quality in european e-learning: An introduction, in handbook on quality and standardisation in e-learning.* Springer: Berlin, Germany. 1–13.

European Commission (2001). The elearning action plan: Designing tomorrow's education", communication from the commission to the council and the european parliament, com, 172 final. Available: http://europa.eu.int/eur-lex/en/com/cnc/2001/com2001_0172en01.pdf.

Hassanzadeh, A., Kanaani, F. and Elahi, S. (2012). A model for measuring e-learning systems success in universities. *Expert Systems with Applications,* 39(12): 10959-66.

Hattabi, S. (2019). E-learning and its relationship to the guarantee of total quality in university education. *Arab Journal of Arts and Humanities,* (6): 243-60.

Hennawi, M., 2017. "Evaluation of the course "learn how to learn" based on self e-learning from the perspective of learners and coordinators in al quds open university. Journal Dirasat of Educational Sciences." In *Special edition for the Conference of Educational Sciences Faculty, titled: Conference of Higher Education in the Arab World, held at the faculty of Educational Sciences in the University of Jordan.* pp. 205-19.

Hsu, C.-M., Yeh, Y.-C. and Yen, J. (2009). Development of design criteria and evaluation scale for web-based learning platforms. *International Journal of Industrial Ergonomics,* 39(1): 90-95.

Hussin, H., Bunyarit, F. and Hussein, R. (2009). Instructional design and e-learning: Examining learners' perspective in Malaysian institutions of higher learning. *Campus-Wide Information Systems,* 26(1): 4-19.

Itmazi, J. (2015). *Sistema flexible de gestión del elearning para soportar el aprendizaje en las universidades tradicionales y abiertas.* Ph.D.disscertation, Granada University, Spain.

Jou, M. and Wu, Y. S. (2012). Development of a webbased system to support self-directed learning of microfabrication technologies. *Educational Technology and Society,* 15(4): 205–13.

Liu, Y. and Wang, H. (2009). A comparative study on e-learning technologies and products: From the east to the west. *Systems Research and Behavioral Science,* 26(2): 191–209.

Lu, H. and Chiou, M. (2010). The impact of individual differences on e-learning system satisfaction: A contingency approach. *British Journal of Educational Technology,* 41(2): 307-23.

Lui, M. (2001). Systematic web-course development process: User-Centered Requirements. *Educational Technology,* 41(6): 15-22.

Malik, M. (2010). Factor effecting learner's satisfaction towards e-learning: A conceptual framework. *OIDA International Journal of Sustainable Development,* 2(3): 77-82.

Masoudi, H. (2018). The effect of a proposed educational site in the achievements of female students of the department of curriculum and teaching methods at umm al qura university in the skills of designing electronic courses. *Journal of Educational and Psychological Sciences,* 2(8): 1-25.

Mills, S., Casebeer, M. and Cindy, M. (2009). Perceptions of distance learning among faculty of a college of education, merlot. *Journal of Online Learning and Teaching,* 1(5): Available: http://jolt.merlot.org/vo/5no/mills-0309.htm

Moller, L., Foshay, W. R. and Huett, J. (2008). The evolution of distance education: implications for instructional design on the potential of the web. *TechTrends,* 52(3): 70-75.

More, N. and Pinhey, K. (2016). Guidelines and standards for the development of fully online learning objects. *Interdisciplinary Journal of Knowledge and Learning Objects,* 2(1): 95–103.

Qashmar, A. (2017). E - learning requirements in the university educational process. *Journal of The Gil of Human and Social Sciences,* (28): 149-70.

Salloum, A., Kasasbeh, E. and Al-Sukkar, A. (2015). The reality of e- learning at the mutah. *European Journal of Business and Management,* 7(10): 282-89.

Sorokina, T., Herrera, M. and Gonzalez, M., 2002. "The collaborative study in -the virtual - classroom: Some practices in distance learning carried out in a mexican public - university: University autonoma metropolitana – azcapotzallco (uam-a) Mexico city." In *World - Conference on E- Learning in Corp., Govt.*

Swansea University (2007). Guidelines for the development of E-learning materials, Version 1.1. Available: www.swan.ac.uk

Tagoe, M. (2012). Learners' perceptions on incorporating e-learning into teaching and learning at the University of Ghana. *International Journal of Education and Development using Information and Communication Technology,* 8(1): 91-103.

Teo, C., Chang, S. and Leng, R. (2006). Pedagogy considerations for E-learning. *International Journal of Instructional Technology and Distance Learning,* 3(5): 3-26.

Tung, H., 2003. "A Study on the critical factors of the performance of E-learning application on education from the learning theory perspective." In *unpublished master thesis, Ming Chuan University, Taipei, Taiwan.*

Vovides, Y., Sanchez-Alonso, S., Mitropoulou, V. and Nickmans, G. (2007). The use of E-learning course management systems to support learning Strategies and to improve self-regulated learning. *Educational Research Review,* 2(1): 64-74.

Zaharias, P. and Poulymena, A. (2008). *Design guidelines for asynchronous e-learning applications. Chapter liii, in: Kidd, terry t. and song, holim, handbook of research on instructional systems and technology.* Information science reference: Hershey, New York, II.