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NEW E-LEARNING QUALITY MATRIX TO ELQ ASSESSMENT AT AL-BALQA APPLIED UNIVERSITY

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ABSTRACT

This paper deals with the quality of e-learning at AL-Balqa Applied University – Jordan. It discusses the already developed measures on the basis of statistical analysis for data gathered from e-learning elements which evaluates the quality of e-learning applications and systems.
The main contribution of the paper is the proposal for the quality metrics with the features concerning e-learning platforms in the technological and human aspects.
The study is organized around the seven categories of e-learning quality dimensions: System Design (System Quality), System Design (Information /Contents Quality), System Design (Service Quality), Support Students and Staff, Resource Allocation, System Delivery and System Outcome (Evaluation and Assessment).
The paper also identifies the difficulties that prevent achieving a high level of quality in e-learning at AL-Balqa Applied University. Then, it suggests some ways to overcome these difficulties.
Keywords: *E-Learning, Border Learning, E-Learning Quality (ELQ), E-Learning Quality Matrix*

1. INTRODUCTION

The internet plays an important role in our daily life. Activities that are engaged over the Internet are e-business, network banking, e-entertainment, online information acquisition, and distance learning. Providing an interactive e-learning system is one of the most important Internet applications.

Because of the Internet's characteristics, an online e-learning system removes several limitations in classical learning approaches: location, time, and age. Lifelong learning is easily fulfilled via an e-learning system. Compared with the traditional learning approaches, e-learning systems are superior in terms of convenience, independence, adaptation, and interaction [2] [14].
Recently, several e-learning systems and adaptive online education systems have been proposed to enhance or to assist the traditional learning systems [20][11]. These e-learning systems can be classified into two categories: asynchronous and synchronous systems. For asynchronous e-learning systems, the learning courseware and learning scenario are predefined [9]. Synchronous systems focus on online, real-time, interactive courses via multimedia Web pages, such as a virtual laboratory and a virtual classroom [4], [5].

In AL-Balqa Applied University that organizes border education also offer e-learning courses. This system is commonly called dual mode.

The education policy in Jordan is that the same fundamental quality requirements should apply to e-learning as to board education higher education. However, there is also consensus that there are differences between e-learning and board education.

Traditional quality criteria and evaluation methods do not identify and assess new aspects of higher education that are introduced by e-learning.

2. E-LEARNING QUALITY (ELQ)

In the area of ELQ, there are many studies with specific aspects with some sort of e-learning measures for improving the evaluation of the capability and maturity in e-learning.

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Marchall and Mitchell [3] they apply the CMM and SPICE in the area of e-learning in order to explore whether similar insights could be generated for institutions engaged in online delivery of teaching. They suggest that this model offers a means for institutions to identify systemic weakness in their e-learning development, delivery and management that potentially can inform future resourcing and strategic priorities.

Petch, Calverley, Dexter and Cappelli [16] they were designed to evaluate the operational viability of a method based on the e-Leaning Maturity Model developed at the University of Wellington, New Zealand, which in turn was derived from Carnegie Mellon's widely accepted Capability Maturity Model. A successful benchmarking effort should be able to inform an institution's planning and resourcing processes and the outcomes.

In specific area of education Lutteroth, Luxton-Reilly, Dobbie and Hamer [13] has proposed a maturity model for computing education which is inspired by the SEI's CMM. CMM can be used to rate educational organizations according to their capability to deliver high quality education on a five level scale. The work of Moazzam Baig, Sidra Basharat, and Manzile-Maqsood focuses on the development of a maturity framework for higher educational sector that would enable education providers to improve quality of the existing educational processes and also aid the cost-effective development of value-added and practical processed that have been overlooked in the past [15]. For this purpose they have selected CMM as our base model and People Capability Maturity Model (P-CMM) and CMMI as helping models for quality improvement in higher education sector.

Errol Thompson suggests the international literature in improving student learning in a subject and how to assess the effectiveness of these learning strategies [19]. Thompson proposed a model based on the principles of the CMM in the design perspective in order to encourage the learners to reflect on their learning and to evaluate the effectiveness of their learning.

K. Tawsopar and K. Mekhabunchakij presents a three-dimensional (3D) approach to e-Learning quality improvement called eMM. In the approach the eMM is applied in "Diagnosis" phase as an assessment tool for e-Learning process improvement in institutional context where the key elements necessary for improvement in e-learning activities are identified. The "Development" phase of the 3D approach concentrates on putting together improvement or change packages to target areas of deficiency. In strategic point of views, the packages are translated into implementation plans in a short term, amid term, and a long term. In "Delivery" phase of the approach, the main focus is the human resource and marketing efforts for implementing the change packages in operational point of views. [18]

A recurrent theme in the discussion about e-learning is whether it offers higher or lower quality than other higher education. The quality of e-learning has often been viewed with skepticism and been the target of criticism e.g. [22][21][17]. This criticism has focused on the lack of (physical) interaction [21], technical problems [22], or a technological and aesthetic focus instead of an educational one [1][15]. Other research reports show that the course delivery medium is rarely the determining factor for quality [17], or that online education in itself can be a quality enhancement factor in terms of accessibility, collaboration or community-building, for either teachers or learners e.g. [3][10].

Learning outcomes are at the heart of respondents' understanding of quality in the field of e-learning. When we talk about quality in e-learning, we assume an implicit consensus about the term 'quality'. In fact, however, 'quality' means very different things to most e-learning providers. [7][6] Have suggested the following set of categories:

(a) Exceptionality,
(b) Perfection or consistency,
(c) Fitness for purpose,
(d) Adequate return,
(e) Transformation.

The E-Learning Success Model [8] is a description of a process devoted to measure and assesses success. Success in e-learning is defined as a multifaceted construct to be assessed in three successive stages: system design, system delivery and system outcome. As shown in Figure1.

On the contrary the model presented in Figure 2 assumes that course outcomes are a direct result of motivation to teach [12].

This model highlights the central role of both motivation to learn and learner perceptions of features as barriers or enablers: enhancing trainee perceptions of enablers and addressing concerns about potential barriers are important strategies for enhancing motivation to learn which, in turn, facilitates positive course outcomes.

According to [12] a better understanding of how the use of technology in the delivery of instruction impacts training effectiveness requires the examination of mechanisms that can account for

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differences in learning, such as motivation to learn, as well as direct effects of technology on learning.

3. METHODOLOGY

3.1 Aim of Study

The main aim of this research is to study quality and quality assessment of e-learning. It is meant to be used as a basis for strategic development of the AL-Balqa Applied University management for e-learning quality assurance system.

3.2 Sources of Information

The study is based on the following material and procedures related to aim above:

1. The Jordan context and current situation: Summary and analysis of policy documents from the Jordan Ministry of Higher Education & Scientific Research concerning e-learning in higher education.
2. Questionnaire to agencies and organizations for e-learning in AL-Balqa Applied University:

3.3 Scope of Study

The issue of whether e-learning offers higher, equal or lower quality in comparison to other types of education has not been deal with in this study. Instead, the study focuses on the more open question of what quality in e-learning actually comprises. How can quality are defined in this context in order to be assessed in AL-Balqa Applied University.

3.4 Survey Instrument

The survey instrument is based on the E-Learning Success Model [8], Quality Assurance Model of Web-Based Learning questionnaire [21] and adapted to the context of this study.
The questionnaire was structured using a 5-point Likert Scale. An example of the item is as follows:

- In your opinion, are the following benchmarks present in the University?

Q	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
	1	2	3	4	5

The Likert Scale questionnaire listed the 24 quality benchmarks and requested each respondent to rank each benchmark, what extent is the benchmark present in the institution (ranked from 1 = strongly disagree to 5 = strongly agree)? Those respondents who did not have sufficient knowledge or experience relating to the benchmark could check the "Not Sure" category.

3.5 Data Collection

The survey instrument was made available to the participants via e-mail and a printed out papers. Study participants were requested to make interviews about the ELQ through AL-Balqa Applied University environments and the participants were interact with us to discuss ELQ, after that they were requested to fill in a given questionnaire.
120 people (24 lectures 20% and 96 students 80%) called up the questionnaires, of which 100 actually completed it.

3.6 Data Analysis

The collected data was analyzed using the Statistical Package for the Social Sciences (SPSS) 10.0 software.

4. FINAL RESULTS

The following sections provide a summary of the quantitative analysis of this survey. The intention of this study is to validate the benchmarks for the e-learning quality in general. The following discussion represents a consensus of a majority of the lectures and students in the study. It is, therefore, not appropriate to assume that the attribute outlined in the discussion always represent each and every institution.

The researcher only used some simple descriptive statistics to guide the whole analysis of this study. The section is organized around the seven categories of benchmarks: System Design (System Quality), System Design (Information /Contents Quality), System Design (Service Quality), Support Students and Staff, Resource Allocation, System Delivery and System Outcome (Evaluation and Assessment). The responses from the open-ended questions are listed in the Appendix.

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4.1 System Design (System Quality)

All of the benchmarks in this category were considered important to ensure quality for e-learning regarding the System Design (System Quality). They further examine the extent to which such benchmarks are applied at AL-Balqa Applied University:

- 1.7 % of the participants strongly disagreed with the university achieving the goal of system design (system quality).
- 4 % of the participants disagreed with the university achieving the goal of system design (system quality).
- 8 % of the participants not sure with the university achieving the goal of system design (system quality).
- 54.9 % of the participants agree with the university achieving the goal of system design (system quality).
- 31.3 % of the participants strongly disagreed with the university achieving the goal of system design (system quality).

This can be easily explained in the following scenarios: "As the following table illustrates, the vast majority of the participants of the study agree on the fact that Al-Balqa Applied University achieved the goal of System Design (System Quality) regarding e-leaning" (see Table 1).

4.2 System Design (Information / Contents Quality)

- 1 % of the participants strongly disagreed with the university achieving the goal.
- 6.2 % of the participants disagreed with the university achieving the goal.
- 6.6 % of the participants not sure with the university achieving the goal.
- 61.8 % of the participants agree with the university achieving the goal.
- 24.4 % of the participants strongly disagreed with the university achieving the goal.

This can be easily explained in the following scenarios: "As the following table illustrates, 86.2% of the participants of the study agree and strongly agree on the fact that Al-Balqa Applied University achieved the goal of System Design (Information / Contents Quality) regarding e-leaning" (see Table 2).

4.3 System Design (Service Quality)

- 2.4 % of the participants strongly disagreed with the university achieving the goal of System Design (Service Quality).
- 4.2 % of the participants disagreed with the university achieving the goal of System Design (Service Quality).
- 5.6 % of the participants not sure with the university achieving the goal of System Design (Service Quality).
- 55.2 % of the participants agree with the university achieving the goal of System Design (Service Quality).
- 32.6 % of the participants strongly disagreed with the university achieving the goal of System Design (Service Quality).

This can be easily explained in the following scenarios: "As the following table illustrates, the vast majority of the participants of the study agree on the fact that Al-Balqa Applied University achieved the goal of System Design (Service Quality) regarding e-leaning" (see Table 3).

4.4 Support Students and Staff

- 11.3 % of the participants strongly disagreed.
- 41.3 % of the participants disagreed.
- 1.9 % of the participants not sure.
- 30.3 % of the participants agree.
- 15.2 % of the participants strongly disagreed.

This can be easily explained in the following scenarios: "As the following table illustrates, the majority of the participants of the study disagree on the fact that Al-Balqa Applied University achieved the goal of Support Students and Staff regarding e-leaning" (see Table 4).

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4.5 Resource Allocation

- 10.5 % of the participants strongly disagreed.
- 40 % of the participants disagreed.
- 4 % of the participants not sure.
- 29.5 % of the participants agree.
- 16 % of the participants strongly disagreed.

This can be easily explained in the following scenarios: "As the following table illustrates, 50.5 % of the participants of the study disagree on the fact that Al-Balqa Applied University achieved the goal of Support Students and Staff regarding e-leaning" (see Table 5).

4.6 System Delivery

- 4.2 % of the participants strongly disagreed with the university achieving the goal.
- 8 % of the participants disagreed with the university achieving the goal.
- 2.6 % of the participants not sure with the university achieving the goal.
- 41.8 % of the participants agree with the university achieving the goal.
- 43.4 % of the participants strongly disagreed with the university achieving the goal.

This can be easily explained in the following scenarios: "As the following table illustrates, the vast majority of the participants of the study agree on the fact that Al-Balqa Applied University achieved the goal of System Delivery regarding e-leaning" (see Table 6).

4.7 System Outcome (Evaluation and Assessment)

- 0.4 % of the participants strongly disagreed with the university achieving the goal.
- 1.4 % of the participants disagreed with the university achieving the goal.
- 4.6 % of the participants not sure with the university achieving the goal.
- 60 % of the participants agree with the university achieving the goal.
- 33.6 % of the participants strongly disagreed with the university achieving the goal.

This can be easily explained in the following scenarios: "As the following table illustrates, 93.6 % of the participants of the study agree on the fact that Al-Balqa Applied University achieved the goal of System Outcome (Evaluation and Assessment) regarding e-leaning" (see Table 7).

5. CONCLUSION

E-learning has become a major success at the AL-Balqa Applied University in many faculties for the simple reason that it gives the student much more flexibility and offers the student a motivating learning experience, as the learning space has become much more collaborative.

Al-Balqa Applied University has achieved giant steps in the field of e-learning through the continuing support of the university administration to this method of learning to eventually achieve the goal of becoming an e-learning institution. However, we still need to invest a considerable effort to faster the quality of e-learning with all of its dimensions.

There are numerous challenges that hinder the achievement of this goal including the lack of qualified human resources, technical equipment and the lack financial support for students and faculty members alike.

As shown in the final result section, the majority of the participants in the study (over 85.2%) agree on the fact that Al-Balqa Applied University achieved the goal of System Design (System Quality), System Design (Information / Contents Quality), System Design (Service Quality), System Delivery and System Outcome (Evaluation and Assessment) regarding e-leaning, but the university did not achieved the goal of (Support Students and Staff) and Resource Allocation regarding e-leaning.

In conclusion, even though in some areas the university may be considered as a complete e-learning intuition, in certain areas, traditional board learning is to stay.

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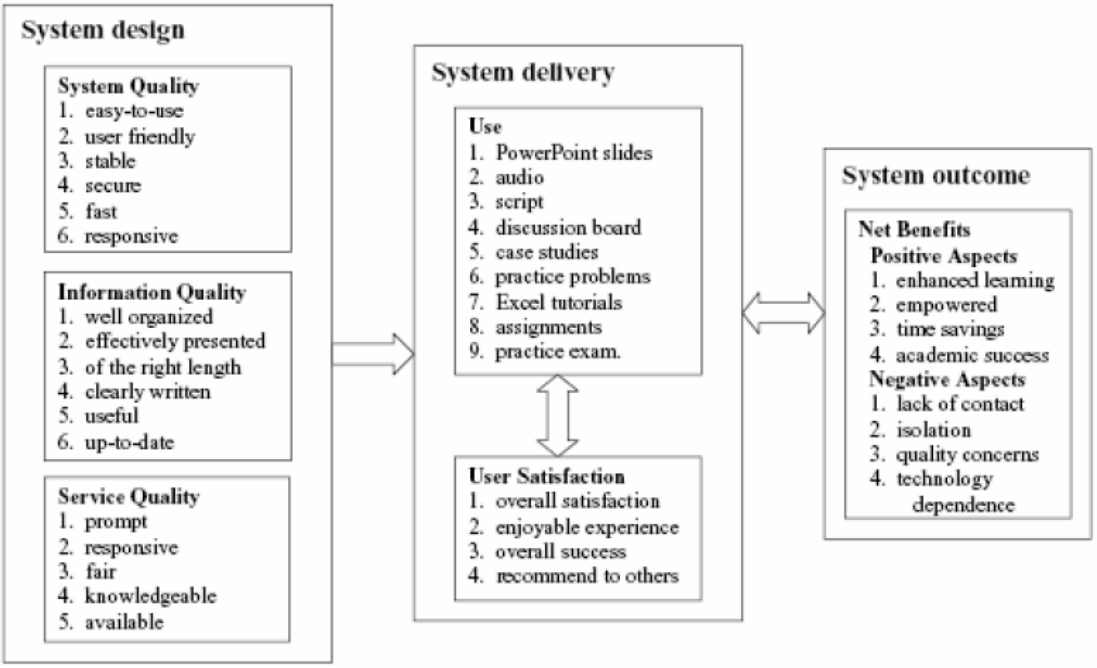

FIGURE 1: THE E-LEARNING SUCCESS MODEL

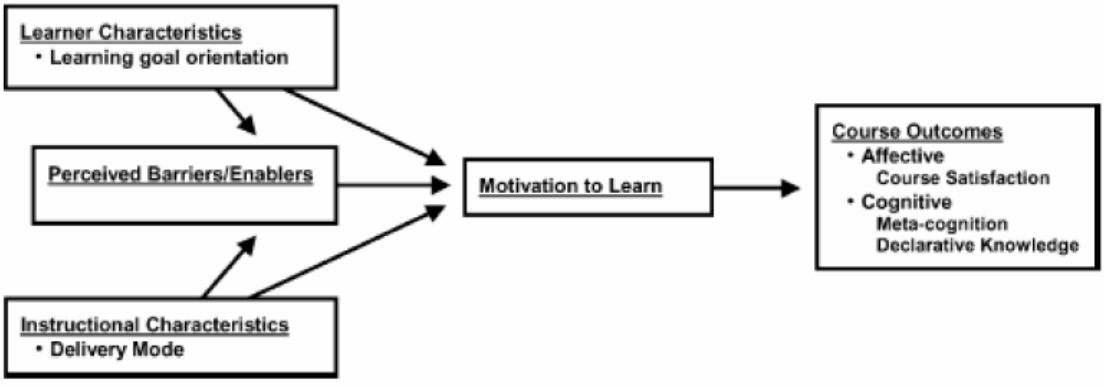

FIGURE 2: THE CONCEPTUAL MODEL OF KLEIN ET AL. (2006)

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Q	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
Q1	1%	3%	6%	57%	33%
Q2	0%	5%	11%	53%	31%
Q3	3%	7%	6%	61%	23%
Q4	2%	2%	8%	49%	37%
Q5	2%	3%	9%	54%	32%
Avg	1.7%	4%	8%	54.9%	31.3%

TABLE 1. SURVEY STATISTICS ON THE PRESENCE OF THE SYSTEM DESIGN (SYSTEM QUALITY) BENCHMARKS

Q	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
Q6	1%	6%	2%	61%	30%
Q7	0%	5%	16%	67%	12%
Q8	1%	7%	8%	61%	23%
Q9	1%	8%	3%	58%	30%
Q10	2%	5%	4%	62%	27%
Avg	1%	6.2%	6.6%	61.8%	24.4%

TABLE 2. SURVEY STATISTICS ON THE PRESENCE OF THE SYSTEM DESIGN (INFORMATION / CONTENTS QUALITY) BENCHMARKS

Q	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
Q11	3%	5%	6%	55%	31%
Q12	3%	4%	4%	49%	40%
Q13	4%	4%	7%	58%	27%
Q14	1%	3%	6%	54%	36%
Q15	1%	5%	5%	60%	29%
Avg	2.4%	4.2%	5.6%	55.2%	32.6%

TABLE 3. SURVEY STATISTICS ON THE PRESENCE OF THE SYSTEM DESIGN (SERVICE QUALITY) BENCHMARKS

Q	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
Q16	13%	40%	0%	27%	20%
Q17	11%	43%	5%	33%	8%
Q18	7%	38%	1%	29%	25%
Q19	4%	47%	4%	35%	10%
Q20	15%	36%	1%	27%	21%
Q21	18%	44%	0%	31%	7%
Avg	11.3%	41.3%	1.9%	30.3%	15.2%

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TABLE 4. SURVEY STATISTICS ON THE PRESENCE OF THE SUPPORT STUDENTS AND STAFF BENCHMARKS

Q	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
Q22	9%	43%	6%	33%	9%
Q23	12%	37%	2%	26%	23%
Avg	10.5%	40%	4%	29.5%	16%

TABLE 5. SURVEY STATISTICS ON THE PRESENCE OF THE RESOURCE ALLOCATION BENCHMARKS

Q	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
Q24	8%	11%	2%	42%	37%
Q25	4%	10%	0%	39%	47%
Q26	6%	9%	3%	46%	36%
Q27	2%	8%	1%	45%	44%
Q28	1%	2%	7%	37%	53%
Avg	4.2%	8%	2.6%	41.8%	43.4%

TABLE 6. SURVEY STATISTICS ON THE PRESENCE OF THE SYSTEM DELIVERY BENCHMARKS

Q	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
Q29	1%	2%	5%	62%	30%
Q30	0%	0%	8%	58%	34%
Q31	0%	1%	3%	67%	29%
Q32	0%	0%	0%	55%	45%
Q33	1%	4%	7%	58%	30%
Avg	0.4%	1.4%	4.6%	60%	33.6%

TABLE 7. SURVEY STATISTICS ON THE PRESENCE OF THE SYSTEM OUTCOME (EVALUATION AND ASSESSMENT) BENCHMARKS

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SURVEY QUESTIONNAIRE:

1 - System Design (System Quality)	
Q1	The E-learning that includes electronic security measures is in place to ensure both quality standards and the integrity and validity of information.
Q2	The E-learning system is easy to use, user friendly and stable.
Q3	The E-learning system is fast and responsive.
Q4	The E-learning system provides interaction, fun, innovation and motivation.
Q5	Students receive information about e-learning system and student support services.
2 - System Design (Information / Contents Quality)	
Q6	Guidelines regarding minimum standards are used for course development, design, and delivery.
Q7	Instructional materials are reviewed periodically to ensure they meet program standards (up to date).
Q8	In e-learning system well organized information and effectively presented.
Q9	Information clearly written.
Q10	Courses are design to require students to engage themselves in analysis, synthesis, and evaluation as part of their course and program requirements.
3 - System Design (Service Quality)	
Q11	Faculty members are provided with written resources to deal with issues arising from student use of electronically accessed data.
Q12	Students are provided with supplemental course information that outlines course objectives, concepts and ideas, and learning outcomes for each course.
Q13	The E-learning system available 24/7
Q14	The E-learning system provides flexibility and reliability.
Q15	Feedback to student assignments and questions is constructive and provided in a timely manner.
4 - Support Students and Staff	
Q16	Students they have access to the minimal technology required by the e-learning.
Q17	Students are provided with hands-on training and information to aid them in securing material through electronic resources and using e-learning system.
Q18	Students have access to technical assistance and convenient access to technical support staff.
Q19	Technical assistance in course development is available to faculties, who are encouraged to use it.
Q20	Instructor training and assistance, including peer mentoring, continue through the progression of the online course.
Q21	The university provides support for building and maintaining the e-learning infrastructure.
5 - Resource Allocation	
Q22	Students are instructed in the proper methods of effective research, including assessment of the validity of resources.
Q23	Students have access to sufficient library resources that may include a "virtual library" accessible through the World Wide Web.
6 - System Delivery	
Q24	The reliability of the technology delivery system is as failsafe as possible.
Q25	The E-learning system use PowerPoint slides, audio, script and other multimedia elements.
Q26	The E-learning system provide discussion board, online exam and practice exam.
Q27	I Recommend e-learning system to be used by others.
Q28	Overall satisfaction when using e-learning system.
7 - System Outcome (Evaluation and Assessment)	
Q29	E-learning is assessed through an evaluation process that uses several methods and applies specific standards.
Q30	The E-learning system enhances learning.
Q31	The E-learning system saves time.
Q32	The E-learning system saves money.
Q33	E-learning is Influential and more effective than classroom learning.