Proposed V-E-learning Model: Applying V-Model to Ensure the Quality of E-Learning System Implementation at Higher Education Institutions (The Case of Dar Al Uloom University - COVID-19 Pandemic Effect)

Mohammad Samir Abdel-Haq; Evan Asfoura
mohdsamir@dau.edu.sa; Evan@dau.edu.sa.
Dar Al Uloom University
Kingdom of Saudi Arabia

Article History: Received: 10 November 2020; Revised 12 January 2021; Accepted: 27 January 2021; Published online: 5 April 2021

Abstract:
Since March 2020, CORONAVIRUS (COVID-19) pandemic has affected many sectors, including education sector at the global level and at the Kingdom of Saudi Arabia. Preventative procedures have been taken, including suspending teaching and training for K-12 and higher education and moving to use distance education as an alternative to face-to-face education, with the continuation of the Corona pandemic, the Ministry of Education decided to consider the e-learning (distance education and blended education) as a strategic alternative to overcome crises threatening the educational process . With the widespread use of e-learning platforms in the Kingdom of Saudi Arabia, the interest of the quality of e-courses increased more than before. Therefore, this study proposes a model for ensuring the quality of e-learning and e-courses in higher education institutions and developing a set of evidence and suggested performance indicators that help those responsible for quality management to verify and validate the adherence to these standards. Dar Al-Uloom University was chosen as a case study of what was implemented during the Corona pandemic and the extent of the university's commitment to this standards to ensure continuous improvement and raise the level of performance related to the e-learning system and its e-courses.

Keywords: E-learning; E-Courses; Quality Standards of E-learning; V Model; COVID-19.

I. Introduction:

E-learning is referred to the use of information and communications technology in teaching and learning. E-learning includes concepts a lot more than online learning, such as virtual learning, distributed learning, networked or web-based learning. As the letter "e" in e-learning stands for the word "electronic", e-learning would incorporate all educational activities that are carried out by individuals or groups working online or offline, and synchronously or asynchronously via networked or standalone computers and other electronic devices (Sangra, Vlachopoulos, and Cabrera, 2012). In our rapid changing worlds, the technologies and communications are important reasons in change the learning patterns, learning today are no long confined in classrooms as the only method conveying knowledge, skills and values.

CORONAVIRUS (COVID-19) pandemic in the year 2020 affected all sectors, especially the educational sector worldwide, which led to the closure of schools and universities on a large scale, in March 2020. E-learning and distance learning were the best alternative to face this pandemic, and as a result, there was a significant rise in reliance on e-learning platforms and virtual classes to ensure the

continuity of the educational process throughout the world and in the Kingdom of Saudi Arabia in particular. COVID-19 caused increased reliance on e-learning, most universities seek to use e-learning as a mechanism of delivery for courses. The higher educational sector in the Kingdom of Saudi Arabia has achieved great success in dealing with Covid-19 pandemic due to the readiness of the educational and technical infrastructure in universities and the controls and procedures set by the Saudi Ministry of Education and the introduction of alternatives that help universities in overcoming this crisis, accompanied by awareness and commitment of decision makers, faculty members, staff, and students at those universities. E-learning and distance learning has become a strategic choice in universities due to the benefits and features that can be offered as a major method in teaching some courses or using it as an assistant for traditional learning through Blended education.

Despite the availability of the infrastructure, administrative, and quality standards for e-learning systems in the Kingdom of Saudi Arabia, universities must establish mechanisms to monitor and evaluate the extent of compliance with these standards, in particular the standards related to the electronic content of the curriculum and improve work through the results obtained from the evaluation results. Therefore, the need increased more and more to apply the standards that help to judge the quality of e-learning systems and impose governance and accountability within the educational institution. Mechanisms and methodologies of evaluation for information systems and learning systems are multiple, one of mechanisms for evaluating the development and implementation of information systems is what is known as V Model, this model considers the evaluation process as a continuous process and depends on evaluating each stage of the project or working up-to-date to obtain results that help in developing improvement plans During the implementation of the project and not to wait for the completion of the delivery. In this study, this model was used to assess the quality of e-learning, and the study took Dar Al Uloom University as a case study. Dar Al Uloom University offers academic programs in bachelor's and master's degrees by six colleges, namely Business Administration, Law, Medicine, Dentistry, Architecture and Digital Design, College of Pharmacy and Applied Medical Sciences. These programs are offered by face-to-face learning mode. Because of the Corona pandemic, the university committed to the instructions of the Ministry of Education to provide programs of the Faculty of Law and Business Administration through distance learning and to provide medical and engineering programs through blended learning, all of which are administered through the e-learning system of Dar Al Uloom University. Dar Al Uloom obtained institutional academic accreditation from the Education and Training Evaluation Commission in the Kingdom of Saudi Arabia; this indicates its commitment to the quality of education. The university is keen to ensure the quality of e-learning (distance learning and blended learning) as a new experience.

Researchers in the higher education sector seek to participate in providing research contributions under the COVID-19 pandemic to serve the educational process and raise its level, and for this reason, this study provides a suggested model for checking the quality of the e-learning system in universities based on the V model to be applied on Dar Al Uloom University as a case study for this research (V-E-learning Model), which helps to improve performance and provide an e-learning environment With high quality, which serves the learner and provides him with interactive electronic learning content that increases his motivation to learn.

II. RESEARCH BACKGROUND

A. Distance Learning in the Kingdom of Saudi Arabia pandemic COVID-19

Because the conditions imposed by the COVID-19 pandemic, the Ministry of Education in the Kingdom of Saudi Arabia has made great efforts to limit the spread of the new Corona Virus 19-COVID and based on the decision of His Excellency the Minister of Education No. 79305 dated (7/13/1441 AH) (March 8, 2020) to suspend the teaching process in schools and universities, both governmental and

private, beginning Monday, (7/14/1441 AH) (9 March 2020) with the activation of virtual classrooms and distance learning during the suspend period. The Ministry of Education also developed a well-structured guide for universities to help them to develop effective solutions for the current situation, ensuring the continuation of the educational process and enabling students to perform learning activities, exams and achieve learning outcomes (Ministry of Education, KSA, 2020).

The efforts of the Ministry of Education led to the universities' success in dealing with the current situation and completing the educational process in the second and summer semesters of the academic year 2019-2020, The Ministry decided to start the first semester of the year 2020-2021 in universities through distance learning and blended learning. The Ministry of Education developed the Madrasati platform (https://schools.madrasati.sa/) for K-12 as a national project that provides its services to millions of users, including students, teachers and parents, this platform is considered a great achievement by the Ministry to ensure the continuity of education in The Kingdom of Saudi Arabia. Table (1) provides statistical data on e-learning and distance learning in Saudi universities for the second semester 2019-2020. These statistical data reflect the efforts of those universities in activating the e-learning and distance education systems and the high readiness of universities in the Kingdom of Saudi Arabia in dealing with the risks facing the educational system.

Table (1): Statistical data on E-learning and Distance learning in Saudi Universities for the second semester 2019-2020

Number of public universities in the Kingdom of Saudi Arabia	29
Number of private universities in the Kingdom of Saudi Arabia	15
Number of private Colleges (higher education) in the Kingdom of Saudi Arabia	28
Statistical data on E-learning and Distance learning	Second Semester 2019-2020
Number of E-courses	+ 264.000
Number of Virtual Classes	+ 1.500.000
Number of E-discussion boards	+ 48.000.000
Number of faculty members participating across university digital learning platforms	+ 70.000
Number of students interacting on university digital learning platforms	1.160.000

(Source: Ministry of Education, Kingdom of Saudi Arabia, Distance learning statistics)

In the Kingdom of Saudi Arabia, and by a decision of the Council of Ministers on 01-13-1439 AH (03-10-2017), an independent center was established under the name of "National elearning Center" and its board of directors is chaired by the Minister of Education. The National elearning Center has developed standards for controlling the quality of e-learning in K-12 and higher education and training bodies, taking into account the integration with the competent authorities, and it was built according to a study of the most famous international standards, and through polling the opinions of beneficiaries, and holding workshops for education officials, and they were reviewed by local and international experts (National elearning Center, KSA, 2020) . The next section introduces global standards for the quality of e-learning in higher education institutions and the standards developed by the National elearning Center in the Kingdom of Saudi Arabia.

Dar Al-Uloom University DAU-LMS has provided the e-learning system for several years, this system has been used as one of the learning resources that benefit students. An electronic page is available in the e-learning system for each course of that includes electronic contents for learning, electronic assignments, and some electronic exams, DAU-LMS is used as one of the means of communication between Student and faculty member. The availability of DAU-LMS in advance, helped Dar Al Uloom

University to transfer directly to provide e-learning and distance learning. However, attention is now focused on improving the electronic content provided to students and adhering to the quality standards of the e-learning system and the quality of e-courses. Table (2) provides statistical data on e-learning and distance learning in Dar Uloom University for the second semester 2019-2020. These statistical data confirm the university's commitment to implementing e-learning during the Corona pandemic. These statistical data were collected on a weekly basis, that is, after the end of each academic week, to monitor students' commitment to attendance and interaction. It can be noted that the number of e-courses and the number of student entry registrations for these courses in the College of Business Administration, the College of Law and the University Preparation Program (UPP)are more than in other colleges, because in these colleges provided e-learning for all courses, while other colleges provided practical learning in presence with apply the precautionary measures to prevent the spread of Corona virus.

Table (2): Statistical data on E-learning and Distance learning in Dar Al Uloom University for the second semester 2019-2020

No.	Category	College of Business	College of LAW	College of Architecture and Digital Design	College of Medicine	College of Dentistry	UPP	Total
1.	No. of Courses	298	253	88	45	87	146	**917**
2.	Average number of student logins to attend e-courses (Weekly)	3201	4777	1284	1238	562	4355	**15417**
3.	The number of hours of e-learning (Weekly)	1272	570	261	180	123	337	**2743**
4.	Faculty Members	28	31	50	42	33	35	**219**

B. Quality Assurance of E-learming Systems

Quality systems aim to ensure continuous improvement. Therefore, e-learning systems must be evaluated and continuously improved to ensure that high-quality learning processes are applied and to improve student learning outcomes by applying quality standards that consider all stakeholders 'expectations in the e-learning process (Schreurs and Al-Huneidi, 2012) . With the wide spread of e-learning as the main system in distance learning and as a basic supporter of traditional education through blended learning, this attracted great interest by higher education institutions and researchers to develop and apply quality standards for e-learning based on the best practices to improve the level of performance and provide interactive learning for learners through e-learning environments which achieves the desired learning outcomes. The Commission of Institutions of Higher Education in the USA developed five quality components include 29 best practices of e-learning, 1. institutional context and commitment 2. curriculum and instruction 3. faculty support 4. student support 5. evaluation and assessment (Insung Jung, 2010). University of Illinois in 2015 developed quality standards for online courses based on six sections, each section includes specific criteria 1. Instructional design 2.

Communication interaction and collaboration 3. Student evaluation and assessment 4. Learner support and resources 5. Web design 6. Course evaluation (Martin Debattista, 2018). Masoumi and Lindstrom (2011) developed E-learning Quality Framework based on seven factors 1. Institutional Factor 2. Technological Factor 3.Pedagogical Factor 4. Evaluation Factor 5. Student Support 6. Faculty Support 7. Instructional Design (D. Masoumi and B. Lindström, 2011).

There are also many studies that have presented frameworks and standards to ensure the quality of e-learning, Hadullo and Omwenga (2017) provided a framework for ensuring the quality of e-learning that included six factors include Course development, Learner Support, Assessment, User characteristics, Institutional factors and Overall performance (Hadullo, Oboko and Omwenga, 2017) . Khan (2004) provided P3 model for the evaluation of three dimensions of e-learning, the People, the Processes, and the Product (Khan, 2004) . Zhang and Cheng (2012) in their PDPP model, concentrates on fours aspects of quality: planning; development; process and product (Zhang and Cheng, 2012).

QM (Quality Matters Organization) is well-known organization worldwide for ensuring quality in online learning (Sadaf A., Martin F., and Ahlgrim-Delzell L., 2019; Loafman, L. and Altman, B. W., 2014) QM Standards are one of the most widely adopted sets of standards are developed based on the best practices in online courses to promote student learning (Sadaf A., Martin F., and Ahlgrim-Delzell L., 2019) . " The Quality Matters member community is comprised of over 1280 organizations in 20 countries across 6 continents from the higher education, K-12 secondary, educational publishing, and continuing education and professional development arenas (Quality Matters, (QM), 2020). The QM Rubric has eight standards 1. course overview and introduction 2. learning objectives (Competencies) 3. assessment and measurement 4. instructional materials 5. Learning Activities and Learner Interaction 6. course technology 7. learner support 8. accessibility and Usability (Quality Matters, (QM), 2020) . There are 11 Saudi joint universities in the Quality Organization, 10 of which are public universities and Dar Al Uloom University is the first private Saudi university to joint with QM.

The standards developed by the National elearning Center in the Kingdom of Saudi Arabia for higher education institutions consisted of two main sections, the first section: (Entity Standards) includes 27 sub-standards distributed into 3 standards: leadership, technology, qualification and support. The second section (Program Standards) includes 39 sub-standards divided into four standards: design, interaction, fairness and accessibility, and measurement and evaluation (National elearning Center, KSA, 2020).

The above-cited quality standards share a wide range of e-learning quality assessment standards. The most important common standards can be identified with the following components (1) institutional support (2) course development & Structure (3) teaching and learning (4) student support (5) faculty support (6) assessment & evaluation (Insung Jung, 2010). This study relies on these common standards to ensure the quality of e-learning and on the QM standards to ensure the quality of e-courses, and aims primarily to adhere to the standards of the National elearning Center in the Kingdom of Saudi Arabia to develop a proposed model using the Model V methodology that aims to ensure the quality of e-learning using national and international standards which is called V-E-learning Model.

C. Using V-Model to Assess E-learning Quality

The V-Model was introduced by Paul Rook in 1986 and was first used in Germany for use in product development and testing for government defense projects (Awotar and Sungkur, 2018; Durmuş, et al., 2018), the name of V-model refers to the v-shaped, where the stages of the model are designed in the shape of V, the phases on the left have a corresponding phase of activity on the right. The V- Model is used in project management, software development, quality assurance, and configuration management. The V-Model is considered one of the internationally accepted models such as ISO/IEC 12207 or ISO 9001 (Roy A. Boggs, 2004) . What distinguishes this model from other development models is that it focuses on the testing procedures from the beginning for each stage of the project and then the

integration between the components and stages of the project is tested (Durmuş, et al., 2018; Munassar and Govardhan, 2010; Barjtya, Sharma and Rani, 2017; Stephen and Oriaku, 2014). The phases in V-model are classified into verification and validation, where the verification process represents the left side of the V-Model to determine the requirements of the system and the validation process represents the right side to test all the system components, the left and right sides are connected to each other by implementation phase (Awotar and Sungkur, 2018) .

Since the e-learning system consists of several main components, and each of these components is linked to development stages that are governed by a set of quality standards discussed above, the V Model has been relied upon to determine the requirements for providing and developing each of these components (Verification), and on the opposite side of each stage, evaluate the extent of compliance with the readiness requirements and the extent of compliance with the quality standards of this component (Validation). Because of the merging of quality standards with V model, this study proposes a title "V-E-Learning Model" for a proposed model that helps evaluate the quality of e-learning systems.

III. RESEARCH METHODOLOGY

The research methodology based on content analysis method which includes (1) analysing the content of research papers related to quality standards of E-learning system in HEIs, (2) review the reports and procedures of the official authorities in the higher education sector to reduce the spread of the Covid-19 pandemic (3) review experiences of applying the V-Model in developing and testing technical and information systems in various fields (4) Analysis of user requirements for those who are responsible for e-learning in Dar Al Uloom University. This methodology aims to achieve the following research objectives:

1. Determine the quality standards for e-learning systems in higher education institutions and the requirements to achieve these standards (verification process).
2. Determine requirements for testing compliance with quality standards for e-learning systems in higher education institutions (validation process).
3. Propose a model to ensure the quality of E-Learning system implementation at higher education institutions based on V-Model (verification - validation model).

The proposed model called (V-E-learning Model)**,** the letter “V” referred to V-model, the letter “e” stands for the word “electronic”. The proposed model is based on common e-learning quality standards which are extracted from cited researches, the model consists of two basic sides, the left side to define the requirements of achieving e-learning quality standards (verification), and the right side to test the compliance with these standards. Figure No.1 shows the phases of the proposed model (V-E-learning Model) which divided to two parts verification and validation based on V-Model . The following sections explains the phases of V-E-Learning.

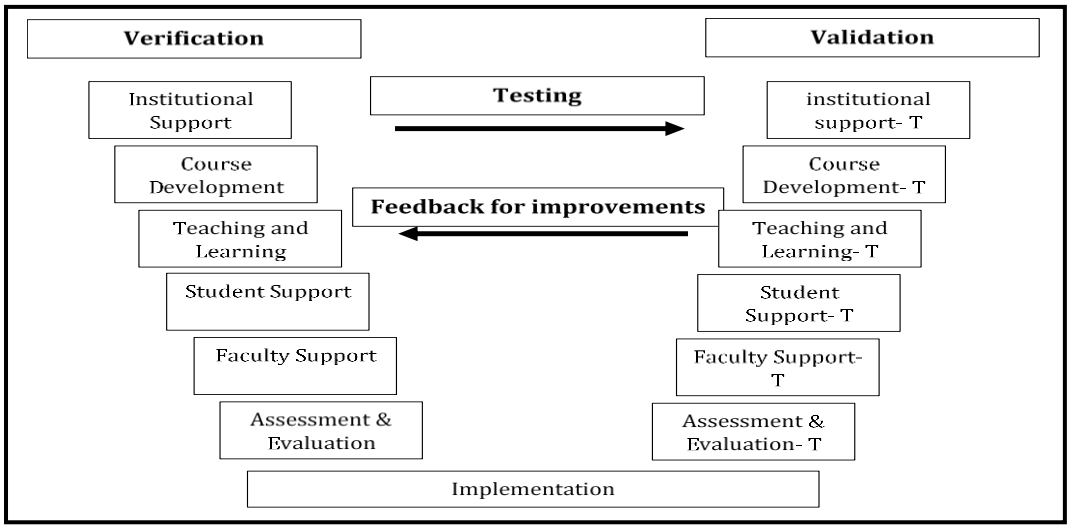

Figure 1 V-E-Learning Model phases (T: stands for Testing)

A. V-E-Learning Requirements analysis (VERIFICATION)

The verification side in V-E-learning is responsible for determining requirements e-learning quality standards which consist of six standards. Each of these standards includes a set of requirements and they work together to ensure a quality e-learning environment and help achieve the learning outcomes expected of students.

1. Institutional Support

The success of the e-learning environment depends on the vision, mission, and goals of the educational institution based on clear plans, policies, and procedures to achieve this success (Martin Debattista, 2018; D. Masoumi and B. Lindström, 2011). The educational institution shall establish a governing body with expertise in the field of e-learning that is accountable and ensures the provision of a high-quality e-learning environment (D. Masoumi and B. Lindström, 2011; Frydenberg J., 2002). The educational institution is committed to providing the technical infrastructure that plays a critical role in raising the level of quality and access to e-learning by users. In addition to providing financial support for the management and maintenance of e-learning systems and user training (Insung Jung, 2010; Hadullo, Oboko and Omwenga, 2017). The standards of the National elearning Center defined institutional support according to the criterion of "Leadership" by setting responsibility and governance for the department responsible for the quality of e-learning and setting strategic and operational goals consistent with the vision and mission of the educational institution (National elearning Center, KSA, 2020).

2. Course Development & Structure

This phase focuses on institutional policy and procedures that ensure the quality of course development processes, course materials and learning activities in e-learning (Insung Jung, 2010). Faculty members and curriculum supervisors in the educational institution must develop the course content that is appropriate for the e-learning environment, especially distance learning, and that high-quality content be available interactively via the Learning Management System (LMS) that helps students achieve the intended learning outcomes, raise their motivation to learn, and achieve Students' satisfaction with the e-learning system (Chawinga, 2016). The proposed model in this research is based on the QM Standards “QM Higher Education Rubric, Sixth Edition”, which measure the quality of electronic courses (Quality Matters, (QM), 2020).

3. Teaching and Learning (Instruction)

This phase is the heart of the proposed model because the objective of the proposed model is to ensure a high-quality e-learning environment that ensures the achievement of students' learning outcomes. This phase related directly to Learning Objectives (Competencies), Instructional Materials, Learning Activities, learning resources, Learner-Centeredness and Learner Interaction all these factors are considered as pedagogical factors (D. Masoumi and B. Lindström, 2011; Marshall S., 2006; Holsapple C.W. and Lee-Post A., 2006). The National elearning Center has set a special standard for "Design" for practices related to designing electronic courses or using ready-made courses licensed by educational service providers, in order to achieve educational competencies and goals and link them to various course activities, including exams, discussion, research, homework and other requirements for measuring educational objectives. This standard also includes all practices related to the resources related to the e-course such as databases, e-books and e-libraries provided by the educational institution or other open educational resources (National elearning Center, KSA, 2020). Because the interaction between the learner and the faculty member is one of the basic factors in the success of the e-learning environment, the National elearning Center has set a standard of "Interaction" for practices related to active learning and the interaction and participation of learners with the e-course, the educational activities and the faculty member (National elearning Center, KSA, 2020).

4. Student Support

The educational process in face-to-face learning and e-learning is concerned primarily with student-centrality, and in e-learning and distance learning, more attention in this aspect is to provide support in various forms to enable the student to present his high potential and raise his motivation towards learning, which helps to achieve the intended learning outcomes instructional support, academic support, technical support, administrative support, psychological and social support (Martin Debattista, 2018; Insung Jung, 2010; Hadullo, Oboko and Omwenga, 2017; Schreurs and Al-Huneidi, 2012). Also, student's satisfaction with the quality of the support provided to them is one of the most important performance indicators for judging the quality of the e-learning environment (D. Masoumi and B. Lindström, 2011; Laurillard D., 2002; Sadaf A., Martin F., and Ahlgrim-Delzell L., 2019). The National elearning Center has set a standard of “Fairness and Accessibility” practices related to ease of access, learning, and the use of e-learning programs, tools and technologies applied in the university or educational institution, and what is circulated through it in terms of learning resources, knowledge exchange, interaction and communication(National elearning Center, KSA, 2020).

5. Faculty Support

One of the most important criteria for the quality of e-learning is the support provided to faculty members to perform their duties in a manner that achieves the goals of the educational process (Gaebel, M., 2015; Insung Jung, 2010). The educational institution must provide a set of policies and procedures that ensure the provision of this support, such as continuous training, technical support (Insung Jung, 2010), instructional design support (D. Masoumi and B. Lindström, 2011) and pedagogical support needed to develop and provide e-learning courses (Tham C.M. and Werner J.M., 2005). The National elearning Center has set a standard for "Qualification and Support" for practices related to the development and training of faculty members and learners to enable them to present their tasks in the field of e-learning (National elearning Center, KSA, 2020) .

6. Assessment & Evaluation

The Assessment and evaluation process in e-learning is always the focus of discussion among educators, especially educators, who see that this process does not have credibility in evaluating students'

performance in the e-learning and distance learning environment, Others argue that the evaluation process in e-learning faces problems such as literary plagiarism, security issues, accessibility, and identification (Laurillard D., 2002; Wahlstedt A., Pekkola S. and Niemelä M., 2008). Therefore, there should be a great focus on evaluation tools and methods used in e-learning and ensuring the quality of the process to present evaluation results that are credible, reliable, and fair. However, the evaluation process determines the student's mastery of the intended learning outcomes, they must be compatible with educational content and learning activities (Hadullo, Oboko and Omwenga, 2017) . Evaluation methods in e-learning can take different styles, either directly evaluated by teachers using assignments, tests, electronic discussions, and students' electronic portfolios. On the other hand, the criteria for judging the student's performance through evaluation methods must be clear and consistent with institutional policies and announced in advance to all students, as well as delivery dates and providing appropriate feedback to students at the appropriate time (Hadullo, Oboko and Omwenga, 2017; Chawinga, 2016; Martin Debattista, 2018; Schreurs and Al-Huneidi, 2012; Sadaf A., Martin F., and Ahlgrim-Delzell L., 2019).

The Ministry of Education in the Kingdom of Saudi Arabia developed a guide for arrangements for exams and evaluation during the suspension of the study period for the prevention of Corona virus and circulated it to all universities, This guide provided several methods for implementing the evaluation process for students, namely: electronic exams, open book exams, oral exams through LMS, presentations and participations during lectures in virtual classes, assignments and homework, discussion boards, E-portfolio, scientific and research projects, take home exam (Ministry of Education, KSA, 2020). The National elearning Center has also set a standard of "measurement and evaluation" for practices that enable the learner to monitor his performance. The faculty member has also been able to measure the performance of learners and analyze their needs to adapt teaching methods to these needs and measure the level of progress of the educational process through all types of evaluation and feedback methods (National elearning Center, KSA, 2020) .

B. V-E-Learning Testing Process (VALIDATION)

Validation process in the proposed model aims to determine requirements, evidence and KPIs for validating compliance with quality standards for e-learning system. The validating process is a continuous process that begins with the beginning of planning and implementation of the e-learning project, for each stage of the e-learning quality standards verification process is matched by the validation phase, as shown in Figure (1). When starting the validation process, the reviewers use the tools suggested in Table (3) to validate the extent to which the quality standards of e-learning are met and to provide proposals and recommendations to improve the quality of the e-learning system. Based on the results and the recommendations of the reviewers, those responsible for e-learning develop plans that ensure continuous improvement of the effectiveness and quality of the e-learning system at the university. Table (3) clarifies the proposed activities that help to validate compliance with the standards (validation process), which includes a set of evidence, performance indicators and user satisfaction.

Table (3) verification and validation activities

Verification Process	**Validation Process**		
E-learning Quality Standards	**Evidence**	**KPIs**	**Validation Tools**
1. Institutional Support	• E-learning Strategic Plan • E-learning Implementation Plan	• Percentage of achieved objectives of the e-learning strategic plan.	• Monitoring Plan of e-learning strategic plan.

	• E-learning Organizational Unit • E-learning Policies. • E-learning Infrastructure. • E-learning Budget. • Institutional commitment of implementing quality standards for e-learning. • Continuous review of the performance of the e-learning system by the educational institution.	• Beneficiaries' satisfaction with e-learning policies and guides. • Proportion of the budget dedicated to e-learning. • The accreditations obtained by the educational institution for the e-learning system. • The number of electronic courses that have been accredited by accreditation bodies such as Quality Matters Organization. • KPIs of e-learning improvement plan. • Beneficiaries' satisfaction with the support provided by the institution for the e-learning environment.	• Average Beneficiaries overall rating for with e-learning policies and guides on a five-point scale in a semiannual survey. • Annual expenses statements for the budget allocated to e-learning and the results of studying the return from those expenses. • Average Beneficiaries overall rating for the support provided by the institution for the e-learning environment. on a five-point scale in a semiannual survey.
2. Course Development & Structure	• Availability of unified institutional policies and procedures that ensure the quality of course development, course materials, and learning activities in e-learning. • Availability of an easy-to-use learning management system (LMS) and virtual classroom. • Availability of unified template for all electronic courses that guarantees the course structure in a way that facilitates the student's access to the course contents (course information, course layout, course structure and course organization). • Instructions on how to start and how to access the various components of the e-course are provided. • Course tools and communication and communication tools support active learning and students' interaction and participation with the e-course. • Availability of mechanisms for reviewing the content of e-courses by specialists in the course field.	• Students' satisfaction with organizing and structuring e-courses. • Beneficiaries' satisfaction with the LMS and virtual classrooms. • Percentage of courses that were evaluated based on QM standards and achieved advanced levels.	• Average Beneficiaries overall rating for organizing and structuring e-courses on a five-point scale in a semiannual survey.

3. Teaching and Learning (Instruction)	• The availability of course specification for students on the e-course page. • Measurable learning outcomes linked to unit / unit level learning objectives and learning activities are available and announced to students. • Learning outcomes are measured at planned timeline. • The instructional materials are up to date and varied, consistent with learning outcomes and learning activities, and linked to course tools and learning resources • Instruction manual for using instructional materials and learning activities is provided to students. • A students' guide is provided that includes teaching strategies and learning activities that are diverse and support interactions between teacher and students, and between students. • A guide to rules, tools and times of communication is provided, and it explains mechanisms for providing feedback to students. • All internal and external learning resources are available for students on the e-course page, considering academic integrity and intellectual property rights. • All technical tools are available for students on the e-course page and can be accessed and used on all various devices. • A manual for using technical tools is available for students.	• Course Report Results. • Results of measuring students' learning outcomes. • Students' satisfaction with the appropriateness of learning outcomes for instructional materials and learning activities. • Students' satisfaction with instructional materials, design, presentation, and ease of use. • Students' satisfaction with teaching strategies and their ability to assist them in achieving learning outcomes. • Students' satisfaction with the appropriateness, accessibility, and ease of use of internal and external learning resources. • Students' satisfaction with the mechanisms of communication and interaction in the e-course. • Students' satisfaction with the technical tools provided by the e-course. • Students' satisfaction with the guidelines provided by the e-course for the use of instructional materials, learning resources and technical tools.	• Benchmarking of learning outcomes measurement results with previous years. • Average Students overall rating for the aspects related to learning outcomes and teaching and learning on a five-point scale in a semiannual survey.
4. Student Support	• Academic, psychological and social advising policies and procedures are provided to students in an e-learning environment that assist	• Students' satisfaction with academic, psychological and social advising support services in the e-learning environment.	• Average Students overall rating for academic, psychological, and social advising support and technical support services in

	students in achieving learning outcomes. • A technical support team is available, and students know how to obtain this support. • An administrative support team is available that covers inquiries, admissions, applications, and any services related to student service. • Orientation and training programs for students are continuously held on how to use the e-learning system and all its components. • Manuals and instructions about using the e-learning system and all its components are available to the students.	• Students' satisfaction with technical support services in the e-learning environment. • Students' satisfaction with administrative support services in the e-learning environment. • Percentage of students participating in training programs on using the e-learning system. • Students' satisfaction with the training programs and Manuals of using the e-learning system.	the e-learning environment on a five-point scale in a semiannual survey.
5. Faculty Support	• Technical and administrative support is provided to assist faculty members in the e-learning environment. • Faculty members are trained to use the e-learning system and all its components. • Faculty members are trained to use the virtual classroom interactively with students. • The faculty members are assisted and trained in developing the contents of electronic courses in line with the approved electronic courses quality standards. • Faculty members are trained to use Pedagogical theories appropriate to the e-learning environment.	• Satisfaction of faculty members with the technical and administrative support provided to them. • Satisfaction of faculty members with the training programs provided to them on the use of the e-learning system and the use of Pedagogical theories. • Percentage of faculty members participating in continuous development programs. • Results of assessing the quality of e-course contents provided by faculty members.	• Average Faculty Members overall rating for the e-learning environment on a five-point scale in a semiannual survey.
6. Assessment & Evaluation	• Availability of a clear and publicized assessment and evaluation plan that includes descriptive criteria for student performance, diversity and comprehensiveness, grading distribution, accuracy of correction and feedback. • Measurement and evaluation tools are varied and help in measuring students' learning	• Percentage of outstanding students. • Percentage of underachieving students. • Student achievement results compared to previous results for the same course. • Student achievement results compared to results for students in similar courses and programs. • Experts' opinion and qualified bodies that teaching strategies, teaching materials, and assessment tools are	• Percentage of outstanding students to the total number of students in the same year. • Benchmarking the percentage of distinguished students with previous years.

	outcomes and are fair and objective. • An internal benchmarking of student achievement results is made with previous academic semesters / years. • An external benchmark is made for student achievement results with similar academic courses and programs. • Conducting regular external evaluations of instructional materials and evaluation tools by qualified bodies.	consistent with learning outcomes and the level of students.	

IV. DISCUSSION

The purpose of this study was to propose a model to ensure the quality of E-Learning System Implementation in Dar Al Uloom University as one of private higher education institutions in KSA. The university began implementing national and international e-learning quality standards, and this study seeks to participate in achieving this goal. Below, the proposed model is discussed on the status of Dar Al Uloom University.

Institutional Support, The e-learning unit is linked to the higher management at Dar Al Uloom University and has a direct relationship with the Information Technology Department to ensure higher coordination between them, which led to the provision of a strong academic and technical structure that is strengthened through a special budget for e-learning, in addition to the policies and procedures that target all stakeholders. The university began implementing national standards for e-learning and partnered with the Quality Matters Organization (QM) to ensure the application of good international practices, the process of reviewing the quality of all e-courses based on these criteria began.

Course Development & Structure, A learning management system (LMS) has been used at Dar Al Uloom University for years to provide educational materials, receive assignments and electronic tests, and monitor student attendance. As a result of the impact of the Corona pandemic, Dar Al Uloom University provided Microsoft Teams program to activate virtual classrooms and enhance interaction and communication between students and faculty members. The process of developing e-courses is organized through clear and publicized policies and procedures, and a unified template for those courses is presented based on QM standards. The process of developing e-courses is reviewed periodically based on these criteria.

Teaching and Learning (Instruction), There is a course specification for all electronic courses at Dar Al Uloom University that includes several topics, the most important of which are the course learning outcomes linked to learning outcomes at the academic program level, and explains their link to teaching strategies and assessment methods. The course specification also provides grades distribution and delivery times for assignments, exams, tools and learning resources. All this information is presented to the student at the beginning of the semester and appears on the home page of the e-course. Instructional materials and technical tools are provided to students with an explanation of how to use them to achieve course learning outcomes.

Student Support, Dar Al Uloom University, through its Learning Management System, provides integrated services for the academic, psychological, and social advising while preserving the privacy and confidentiality of student data. It also provides a team to provide technical and administrative support services to all students during their learning time. The university also provides a set of

guidelines for using the e-learning system and virtual classrooms, and it periodically holds orientation and training programs for students.

Faculty Support, Dar Al Uloom University holds a professional development program annually for faculty members, and they are trained to use the Learning Management System, since March 2020 due to the Corona pandemic, more emphasis has been placed on this type of training in addition to holding seminars and conferences with the participation of specialists in the field of e-learning to raise the level faculty members skills for this type of education, , such as, quality standards for e-learning, pedagogical theories for the e-learning environment, activation of e-learning tools, application of active learning within the e-learning environment, methodologies for developing e-courses. Technical and administrative support teams were also provided to assist the faculty members.

Assessment & Evaluation, all courses at Dar Al Uloom University adhered to the alternatives set by the Ministry of Education to evaluate students' performance in the distance education stage due to the Corona pandemic. The university has formed a higher committee, "the academic committee", to follow up the implementation of measurement and evaluation tools and to ensure their diversity. Training workshops have been held and the provision of guidelines for faculty members and students, especially for evaluation tools.

Despite the successful efforts made by the University of Dar Al Uloom in e-learning (distance learning and blended education) during the Corona pandemic period, the university needs a system to manage the quality of this educational style by adhering to national and international standards that it has already started with, it also needs to define mechanisms for verifying the extent of adherence to these standards through plans and periodic reports as evidence of implementation as the university developing assessment quality sheets based on the suggested criterial in this study in addition to the suggested validation tools, surveying the opinion of the beneficiaries and developing performance indicators for objective judgment of the quality of e-learning and to ensure continuous improvement by studying the results and developing improvement plans. This proposed model helps those in charge of managing and ensuring quality at the University Dar Al Uloom on implementing quality standards for e-learning, standardizing work and raising the level of performance in all courses, and helps them develop improvement plans based on studying the evidence presented in the model, surveying the opinion of the beneficiaries, and measuring the proposed performance indicators.

V. Conclusion and Future Work

This study aimed to present a proposed model for ensuring the quality of e-learning standards and e-courses. The proposed model was based on the V model, which consists of two main sides, the left side for verification processes and the right side for validation process. The left side of the proposed model for this study presents the global and national standards for e-learning that are cited by studies and approved by official authorities such as the National elearning Center in the Kingdom of Saudi Arabia and the Quality Matters Organization (QM). The right side of the proposed model aims to identify the evidence and performance indicators that help the auditors to ensure compliance with the application of these standards mentioned in the left side. The study reviewed the application of these standards at Dar Al Uloom University, and the results indicated that there is a clear commitment to these standards. Accordingly, future work for this study includes the application of all tools mentioned in the proposed model including evidence, performance indicators and surveys in order to identify strengths and priorities for improvement and present the proposed improvement plans to ensure the continuous improvement of the e-learning environment at Dar Al Uloom University.

Acknowledgement
The researchers extend their thanks and gratitude to the Deanship of Graduate Studies and Scientific Research at Dar Al Uloom University for their support and funding of this study.

REFERENCES

1. Sangra, A, Vlachopoulos, D. and Cabrera, N., 2012. Building an inclusive definition of elearning: An approach to the conceptual framework. *The International Review of Research in Open and Distance Learning.*13(2), pp. ????
2. Ministry of Education, Kingdom of Saudi Arabia, 2020. The guidebook for exam arrangements, evaluation and semester work for universities during a period of suspension for a study to prevent corona virus. Available at: https://www.moe.gov.sa/_layouts/15/MOEResp/Guide_Exams_Evaluation_ArrangementsAr.pdf, [Accessed 19-07-2020]
3. National elearning Center, Kingdom of Saudi Arabia, 2020. National Standards of E-learning. Available at https://nelc.gov.sa/en/standards. [Accessed 01-09-2020]
4. Schreurs and Al-Huneidi, 2012. E-Learning self-assessment model (e-LSA). *The International Conference on E-Learning in the Workplace Conference Proceedings* ICELW. June 13th-15th, New York, NY, USA.
5. Jung, I , 2010. The Dimensions of E-Learning Quality: From the Learner's Perspective. *Educational Technology Research and Development* 59 pp. 445–464. DOI 10.1007/s11423-010-9171-4
6. d Debattista, M., 2018. A Comprehensive Rubric for Instructional Design In E-Learning. The International Journal of Information and Learning Technology Vol. 35 No. 2, 2018 pp. 93-104 Emerald Publishing Limited 2056-4880 DOI 10.1108/IJILT-09-2017-0092.
7. Masoumi D. and Lindström, B. ,2011. Quality In E-Learning: A Framework for Promoting and Assuring Quality in Virtual Institutions. Journal of Computer Assisted Learning (2012), 28, 27–41. doi: 10.1111/j.1365-2729.2011.00440.x
8. Hadullo, Oboko and Omwenga, 2017. A Model for Evaluating E-Learning Systems Quality in Higher Education in Developing Countries. International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2017, Vol. 13, Issue 2, pp. 185-204.
9. Khan, 2004. Comprehensive Approach to Program Evaluation In Open and Distributed Learning (CAPEODL) Model. Introduced in The Program Evaluation Course. George Washington University.
10. Zhang and Cheng, 2012. Quality Assurance in E-Learning: PDPP Evaluation Model and its Application. The International Review of Research in Open and Distance Learning. Vol 13 | No 3. April 2012.
11. Sadaf A., Martin F., and Ahlgrim-Delzell L., 2019. Student Perceptions of The Impact Of Quality Matters-Certified Online Courses On Their Learning And Engagement. Online Learning, 23(4), 214-233. doi:10.24059/olj.v23i4.2009
12. Loafman, L., and Altman, B. W., 2014. Going Online: Building Your Business Law Course Using the Quality Matters Rubric. Journal of Legal Studies Education, 31(1), 21–54.
13. Quality Matters, QM, 2020, available at https://www.qualitymatters.org/qm-membership/faqs/see-qm-members. Accessed 24-06-2020
14. Quality Matters, QM, 2020, available at https://www.qualitymatters.org/qa-resources/rubric-standards/higher-ed-rubric. Accessed 24-06-2020
15. Awotar and Sungkur, 2018. Optimization of Software Testing. International Conference on Computational Intelligence and Data Science (ICCIDS 2018). Procedia Computer Science 132 (2018) 1804–1814
16. Durmuş, Üstoğlu, Tsarev and Börcsök, 2018. Enhanced V-Model. Informatica 42 (2018) 577–585 577. https://doi.org/10.31449/inf.v42i4.2027
17. Roy A. Boggs, 2004. The SDLC and Six Sigma an Essay on Which Is Which And Why?. Issues in Information Systems, Volume V, No 1, 2004.
18. Munassar and A. Govardhan, 2010. A Comparison Between Five Models of Software Engineering. International Journal of Computer Science IJCSI, Issues, Vol. 7, Issue 5, September 2010

19. Barjtya, Sharma and Rani, 2017. A Detailed Study Of Software Development Life Cycle (SDLC) Models. International Journal of Engineering And Computer Science Volume 6 Issue 7 July 2017, Page No. 22097-22100 OI: 10.18535/ijecs/v6i7.32
20. Stephen O. and Oriaku K.A, 2014. Software Development Methodologies: Agile Model Vs V-Model. International Journal of Engineering and Technical Research (IJETR) ISSN: 2321-0869, Volume-2, Issue-11, November 2014
21. Frydenberg J., 2002. Quality Standards in Elearning: A Matrix of Analysis. International Review of Research in Open and Distance Learning. Available at: http:// www.irrodl.org/index.php/irrodl/article/view/109/189. accessed 17, 08, 2020.
22. Chawinga, 2016. Increasing Access to Higher Education Through Open And Distance Learning: Empirical Findings From Mzuzu University, Malawi. International Review of Research in Open and Distributed Learning Volume 17, Number 4. DOI: 10.19173/irrodl.v17i4.2409
23. Marshall S. 2006. MM Version Two Process Assessment Workbook. Report to the New Zealand Ministry of Education. Victoria University of Wellington, Wellington.
24. Holsapple C.W. and Lee-Post A., 2006. Defining, Assessing, And Promoting E-Learning Success: An Information Systems Perspective. Decision Sciences Journal of Innovative Education 4, 67–85. DOI: 10.1111/j.1540-4609.2006.00102.x
25. Laurillard D., 2002. Rethinking University Teaching: A Conversational Framework for the Effective Use of Learning Technologies. Routledge, London. https://doi.org/10.4324/9781315012940
26. Gaebel, M., 2015. E-learning in European Higher Education Institutions – Results Of Two EUA Studies in 2014 and 2015", available at:https://eua.eu/resources/publications/368:e-learning-in-european-higher-education-institutions.html. Accessed 02-09-2020.
27. Tham C.M. and Werner J.M., 2005. Designing and Evaluating E-Learning in Higher Education: A Review And Recommendations. Journal of Leadership & Organizational Studies 11, 15–25.
28. Wahlstedt A., Pekkola S. and Niemelä M., 2008. From E-Learning Space To E-Learning Place. British Journal of Educational Technology 39, 1020–1030. DOI: 10.1111/j.1467-8535.2008.00821_1.x