

Reference Model of E-learning and Quality to Establish Interoperability in Higher Education Systems

<https://doi.org/10.3991/ijet.v15i02.11605>

Arshi Naim ^(✉), Fahad Alahmari
King Khalid University, Abha, Saudi Arabia
arshi@kku.edu.sa

Abstract—This is the extended research work where we tried to add more sections in Quality instruments to their role in achieving interoperability in e-learning and quality. In this paper we included more reference models such as experiences of Quality instruments affected by demographic criteria. In Higher education systems E-Learning faces two major challenges, first to ensure the interoperability of E-Learning (IEL) and secondly, developing quality learning through e-Learning. This research studies the concept, scope and dimensions of interoperability of E-Learning in education with special reference to King Khalid University then the connection and interdependence between with quality development. To impart learning and teaching through E-learning, KKKU has adopted Learning Management Services (LMS) through Blackboard. The university has three types of learning and teaching methods; full online, Blended and Supportive. In this paper we have described the dimensions of quality and the standards of E- Learning for the objectives of IEL and quality development (QD) in KKKU. The research is based principally on secondary data observed from KKKU E-Learning deanship. Also sample of 20 E-Learning experts at KKKU were given closed ended as well as semi closed questionnaires for evaluating the assurance of IEL and QD. These experts are mainly certified online facilitators and admin staff. Results provide the verification of application and presence of IEL and assured the QD process in KKKU in imparting knowledge.

Keywords—Interoperability, LMS, Blackboard, Quality Development, E-Learning

1 Introduction

E-Learning (EL) is explained as a network affinity group sharing their information, Knowledge, proficiency and conferring education to many learners geographically in the same or diversified. EL is learning and teaching online and sharing resources electronically [1]. It is observed that educational sectors such as schools or colleges using E-learning technologies (ELT) are achieving students' learning outcomes more effectively than of the teaching sectors not using [1]. EL is able to provide a platform for commercial sectors to conduct workshops, seminars, presentations and even training programs for professionals within the organization or different, under the same roof or remotely.

Interoperability means the ability of providing and receiving information and resources along with using it again between two different systems. Interoperability is a precondition and a request for quality development that can be described and defined in different ways. Focusing the educational sector, interoperability is an objective in the current environment for all prestigious schools, but it witnessed a problem that the education and learning standards are discussed and developed for temporary span [3] [4]. Interoperability can be classified by their focuses on domains, entities, and implementation scenarios. EL plays a very important role in educational sector and has advanced discussions on interoperability. It is the precondition to solve the technological problems. Based on the above explanation on the development of technological and learning technology standards (LTS), interoperability has to be addressed in respect of the quality of learning, education, and training offers and learning processes [3] [4].

This research is organized in various sections; Literature Review for short description on reviewed previous work. In Discussion, factors and features of QD and quality improvement in e-Learning (QEL) is elaborated along with explanation of interoperability and the methods of its experiments are described [3]. The focus is based on KKU, IEL and QD. It provides the fundamentals in detail like Analyzing learning, instructing, and training in general for QD especially in the field of EL in KKU, explanation on the groupings, generic classification model of educational and LTS applicable for EL [3] and how they are working in KKU are given. Research Methodology confers the method of data collection, structure of Questionnaire and Data Analysis for EL and QD. Finally the paper will show outline Results followed by Conclusion.

2 Literature Review

The fast development in LTS, EL is now referred by most of the educational sectors. Technological revolution commenced with the wide usage of computer and technologies. Children and adults have become the vital part of technology by using more and more electronic devices in their usual endeavors. In this situation EL played an important catalyst by deviating them from misuse of technology to constructive medium for learning and teaching. The same devices such as smart phones, X-Box and other gadgets can be exercised for education reasons. EL has encouraged mass to inculcate them in using E-Books and share knowledge environment virtually all the time [1].

All types of learning are important, traditional as well we online. Traditional environment creates a space for high proximity for discussion, read physiological behavior and psychological gestures, where as EL and LTS give effectiveness of in understanding with the aid moving pictures or videos [1]. Learners are docile and tend to forget learning notions very fast unless, learning resources leave an impression on their brain by some graphics or pictures. Also it has also been found that learners can pay more attention and hold it for longer period of time to visuals. All sectors such as Medicine, Financial Services, Agro based, are enjoying the benefits of EL along with education

sectors for growth, development and sometimes for communication [1]. EL is not a new concept, history has proof of using EL in different ways in education but in 1999, during the CBT (Computer Based Training) systems seminar, when EL was formally presented more people got the advantage of this. EL can be synonymously replaced by “Virtual” or “online learning” [4].

2.1 EL brief history

When Internet was not invented, methods of EL were already practiced by the academicians. Special Professions like office jobs and news agencies were more into EL as it conferred special training for calligraphy, designing and caricature remotely [4]. In that era EL was working under the light of distant learning where researchers, teachers and scholars used to enhance learning by sharing learning resources by posts and telegrams. Even assessments like assignments used to be submitted by the same mode [4]. Isaac Pitman was an innovator, in 1840's Isaac he introduced learning shorthand skill through mails. He also promoted conducting assessments through distant systems [4]. University of Illinois introduced LTS for their students in 1960. This computer based training program (CBT program) was branded as PLATO-Programmed Logic for Automated Teaching Operations but before that in 1924, testing machine was invented to conduct automatic exams. EL started to grow more profoundly when in 1954; Instructive Device was invented by a Harvard Professor, BF Skinner [4]. Start of 1970's EL became two ways communication but when in its initial development, it just gave single medium of contacts. Many academies took the advantages from growing EL and Britain the Open University was the pioneer in implementing standards of EL in teaching programs. [4].

2.2 EL today

Twenty century perceived major development in EL and Internet [2]. Years in 1980's the first MAC facilitated and encourages learners to have personal computers for learning on specific topics, develop knowledge in their area of interests, explore more information, etc. Eventually EL tools and methods started to be used by more educational segments. With moving in the same era, more users joined virtual learning environments, started to connect with people remotely and gain online information for more EL opportunities [4]. In the current scenario several schools and universities delivered courses online, enhance distant learning program, conduct conferences and meeting on virtual environment, etc. All this could happen with the technological advancements that aided educational firms to reduce the costs of distance learning, and building to obtain education for wider audience [2] [4]. Now many firms use EL to train their workforce at all levels to receive expertise in their profession, learn their description and industry and can expand their skill sets.

3 Discussion

Interoperability means the ability of exchange and re use of every kind of information and resources in anyway within or between different systems. The definition of interoperability explains four scopes and can be differentiated in relation to given systems as an example taken in KKU [11]. Interoperability means more than technical conformance: It covers the whole range of requirements and characteristics from any systems and has to be addressed at all different levels and areas. A system consists of internal communication and relationship between all its elements, articles and members and can be defined against its external environment [3]. Interoperability and QD are the main challenges of EL today [3].The acceptance, the realization, and the success of EL offers depend on their interoperability and quality [3] [10]. For this purpose we present that interoperability and quality improvement cannot be prescribed in a selected manner, however there's always the requirement for an edition and specification concerning to the given situation [10] [11]. It is impossible for other persons such as teachers [3] to observe and follow the internal learning processes of a learner. Learning progress, knowledge and competencies are always built by the learner itself and we cannot prove a causal connection between learning offers and learning processes, we can only assume some relationships and its effectiveness.

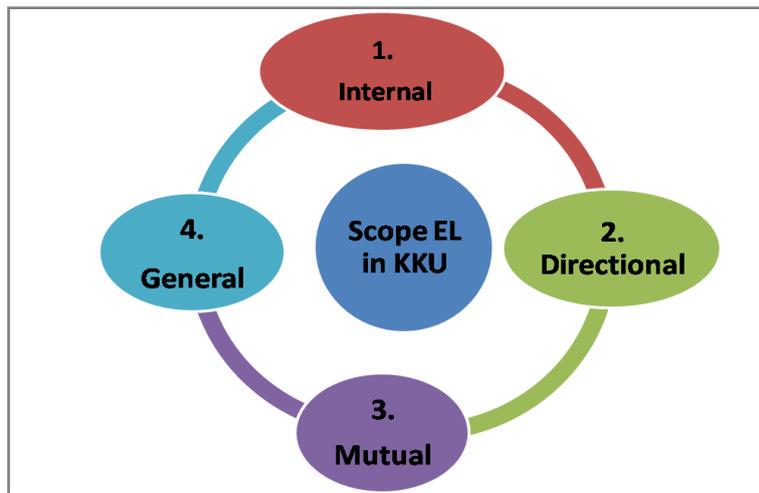


Fig. 1. Scope of Interoperability in KKU system

Table 1. Scope of Interoperability in KKU system

scope	Description
1	The interoperability within the education premises of KKU [2] [3] [5].
2	Interoperability covering from one level to another level in KKUI [2] [3] [5].
3	Interoperability benefitting all levels in KKU [2] [3] [5].
4	Interoperability establishes some protocol or standards for working in KKU [2] [3] [5].
5	Interoperability by the use of reference models of Quality instruments.

Most KKU is using Blackboard, registration deanship and IT facilities to perform internal interoperability between IT experts, E-Learning experts, course instructors and registered learners but till now there is no common platform for all internal entities. Recently Google class room is introduced by the EL, KKU, but its application is still limited to few users [12].

KKU has directional interoperability between EL (LMS), IT and registration services which is monitored by deanship of registration, deanship of EL and IT department. Presence of mutual interoperability of EL is limited to strategic level only. Currently KKU is working on general interoperability like between Blackboard, registration, self-service and IT department. IT can access the KKU employees' systems and solves technical issues remotely. IT can establish the communication network between systems within KKU employees to know the scope of Interoperability in the specific domains to implement QD; however a comprehensive segregation is required.

QD can be characterized as a sort of estimation, confirmation, enhancement, and incessant enhancement of the quality inside given frameworks [5] [7]. As indicated by interoperability QD can likewise be portrayed formally by the picked degree. Quality is definitely not a settled trademark having a place with subjects or frameworks however depends among others on the perspective and the extension [3]. Table 2 gives a brief proportions or dimensions of QD that is adopted by KKU EL deanship.

Table 2. Quality Dimensions (QDM) in KKU

QDM	Description
Prospects	Prospects for the QD in the forthcoming [3][7]
Methods	Description and feasibility analysis of methods for QD [3][7]
Output	QD proving effective output [3] [7]

In this study we focus only on the common characteristics of IEL and QD and their relationships in the field of EL in KKU. If we address the educational section in general, we find that interoperability has been developed only for short time, similar findings we have in the case of KKU but the university has realized its importance and acknowledge it as precondition to solve many several technological problems and facilitate in QD.

Indeed interoperability is the prerequisites for QD and EL. KKU has developed LTS and created an interface called as LMS for the learners, teachers, and other KKU staff to understand the standards of QD, implement Quality in EL and share electronic resources. [3]. KKU has also realized the importance of interoperability as an enabler for the QD in EL by using standards as benchmarking for special support. These standards are used by other the accredited academies [6]. Regularly KKU EL is conducting workshops and online training sessions to teach and train the new, existing and experts' novel development of EL and QD. Online instructors are required to apply QDM in online modules and measure learning outcomes.

3.1 Categories of EL standards

EL principles work at diverse intensities and have several categories where it has to put efforts [3] [6]. These categories include IT service providers, users and stakeholder [3]. All EL users have different level of understanding, motivation and benefits and involvement that eventually affect QD.

EL principles can originally address and support either the clients or the suppliers, or both. As to association utilizing or giving EL it is conceivable to separate the hierarchical dimensions on which an EL standard is centering [6]. There can be more categories in the dimensions of E-learning standards but for the purpose of our study we have considered only three [3].

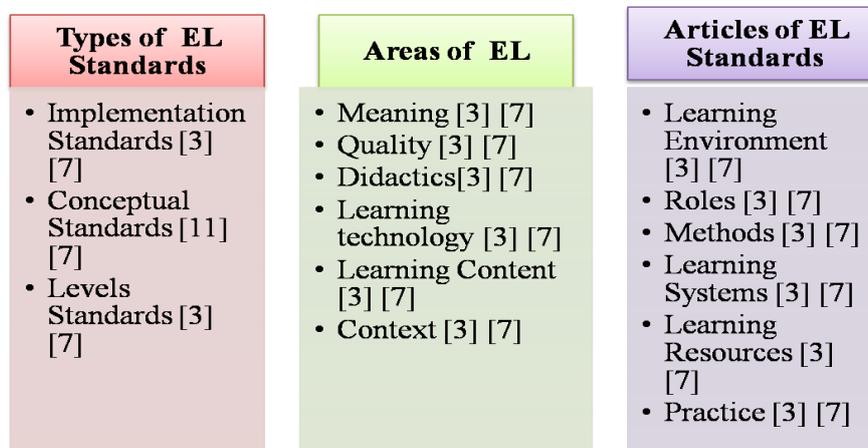


Fig. 2. Dimensions of EL Standards [3]

The three main dimensions of E-Learning standards are [3]: Types of EL standards, Areas of EL Standards, Articles of EL standards and Types of EL standards.

There are three types of EL standards as mentioned above, implementation standards are developed to ensure interoperability within all the areas of EL. KKU provides EL platform to teachers, students, Admin staff, as well to some external members too who offer quality standards to EL. Conceptual standards explains and provides knowledge and solutions for EL issues [11]. KKU's EL provides sharing of concepts, by adding the different users such as teachers, staff members on the same course. Conceptual standards work on some other E-Learning methods too for Quality learning such as Massive Open Online Course (MOOC), E-Course, online training in KKU. Level standards define the QD that should be reached by the application of the EL. It applies for the use of certification [12]. For achieving this standard, KKU EL has given many QD certifications such as Quality development course, peer reviewer, master's reviewer and created interoperability with all entities such as teachers, students, stakeholders. These three types of EL standards can be attributed to the two main purposes and functions of EL standardization which are IEL and QD. Imple-

mentation standards are focusing the interoperability within all domains and level standards addressing the QD in KKU. Conceptual standards can support both the QD as well as the interoperability by implementing and adopting the theory [3]. The following figure3 describes EL relationship, types and purposes.

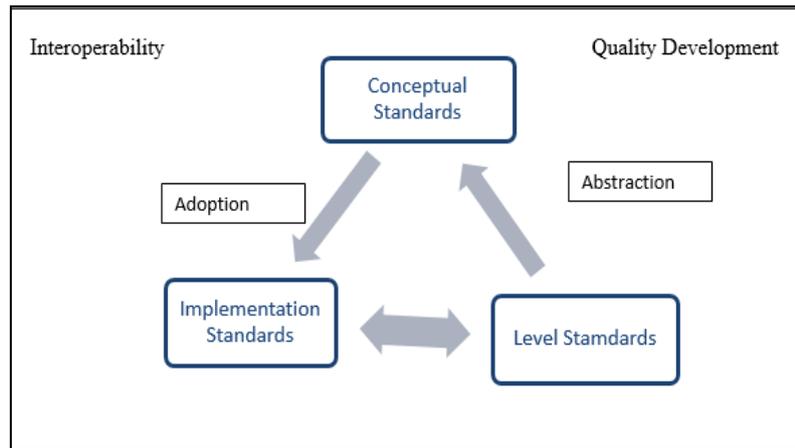


Fig. 3. Types and purposes of EL standards [3]

Level standards in EL measure QD on three scales from Best, to average to poor implications EL covers six major areas for QD.

3.2 Areas of EL [3] [6][10]

Meaning: It is the general understanding and deal with the categorizations of EL standards. Interoperability of KKU EL and QD process work very effectively at all levels. All KKU online users, Teachers, Students and other admin staff members realize the understanding of E-Learning Standards and role in imparting the quality learning and teaching process.

Quality: The field covers all parts of the improvement, affirmation and the executives of value and manages e. g. results, procedures, and possibilities. Online Teachers and E-L experts in accordance with Quality standards work in developing E-Courses aligned with students' centric approach in KKU. Through this teaching pedagogy, interoperability is applied to an extent between online users in learning environment.

Didactics: This manages every single instructive inquiry and issues concerning e. g. strategies, students, and situations. KKU EL has developed a team of experts who monitor the entire online learning process.

Learning Technology: This incorporates all mechanical arrangement particularly produced for learning destinations and purposes and manages issues related to data exchange, interfaces, and accessibility. To solve the technological issues, KKU EL and KKU IT work together and find optimum solutions to all technological issues and provide accessibility to all online users.

Learning Content: This covers all aspects that are necessary for EL resources such as software, web platform, online protocol, and access to digital library, other access to multimedia. Online instructors share learning material, carryout assessments, announce grades, etc, on Learning Management Services KKU EL and aggregate on another online platform KKU registration.

Context: This explains the online controlling bodies and regulations such as use of digital data, copyrights and other online licensing policies. KKU EL deanship clearly specifies all the digital rights management and other laws pertaining to online legal rights.

For reaching interoperability of EL and QD, KKU has been working and to fair extent in all the domain of EL standards. Below given results will verify more on this context, however EL has an option to apply in all areas or in combination or just in one, depends on the level of interoperability.

3.3 Articles of EL Standards

This article of EL majorly focuses on internal and external aspects of academic institutions [3]. It is vital to know the how KKU EL addresses these standards so that quality learning can be attained.

Environment: This encompasses the hierarchical and instructive administration and structure of EL, including the foundation and all administrations and procedures [3]. KKU EL and KKU IT together develop an online learning environment, where all online users can share learning resources, get technological solutions and communicate at all levels in the organization.

Roles: This aspect work distinguished workforce in EL to meet the QD's outcomes. This workforce includes students, traditional instructors, administrative staff, stakeholders and most important online teachers. Online Experts are playing the many roles in KKU EL; they are the trainers, online facilitators, instructors, etc.

Methods: This concern with the tools and techniques used within the EL environment [20]. KKU EL has three learning methods, namely full online, hybrid and supportive learning. All three methods are based on application of some quality standards.

Learning Systems: All the technological and conceptual questions (including the architecture) regarding the systems used within EL is covered in this part. KKU IT aids KKU EL by various other tools to develop learning systems, such as online registration, self-services, employees' corner, research, etc [12].

Learning Resources: Learning material, software and other E-books make this section for EL. KKU provides online learning resources such as digital software, Books on digital library, educational videos, etc on its LMS

Practice: EL makes sure that the exercises and training needed to conduct for online learning environment is appropriately provided. To meet for the best practices KKU EL standards has developed correspondence with more than one entity in combination such as KKU IT, KKU employee's corner, KKU registration, KKU self-services.

4 Research Design and Methodology

This study aims to ensure IEL and QD in KKU and explain a comprehensive online learning environment of KKU. Therefore based on the theoretical concepts earlier in this paper we prepared closed ended and semi closed ended questionnaire and gave to E-Learning Deanship to be filled by E-Learning administration, E-Learning experts and online facilitators.

Our sample size was small; we collected data from 20 people because the questionnaire was designed with many technical terms and people who have good knowledge and experience in E-Learning as well as Quality Development process could provide appropriate information. We divided our questionnaire into 5 sections. Below given is the structure of our questionnaire [3] [5] [7].

Table 3. Questionnaire for IEL and QD

Levels	Questions	Description
1	Scope of Interoperability	Internal, Directional, Mutual ,General
2	Dimension of Interoperability	Types of E-learning, Domain E-Learning, Entities E-learning
3	EL in general	EL Involvement, EL Role , EL Duration
4	Quality in EL	Quality in EL (Involvement), (Understanding) (Importance)
5	Quality Tools in EL	Quality in EL (Approach)
6	Use of Quality instruments in e-learning	Use of Quality Approach, Type of Quality Strategy, Reasons for non-use and Reasons for use of quality strategies
7	Experience of quality instruments and approaches	Cost, Number of Users, Evaluation regarding the approach
8	Questions on statistics and demography	

Below given are sixteen Figures showing Data Analysis for EL and QD, Fig 4: Scope of Interoperability: Results show that KKU has good interoperability within the entities working in EL. Fig 5: Types of E-Learning:-Results show that all three types of EL, implementation, conceptual and levels are equally prevalent in KKU. Fig 6: Shows clear evidence that all domains of EL are directing to develop interoperability of EL and QD in KKU. Fig 7: Survey results show that the entities of EL standards focus equally on all six articles in KKU. Fig 8: In instructive set-up in KKU, EL plays at an advance level. Therefore EL has to assure quality in the learning and teaching environment. Results show excellent involvement of EL in this academy. Fig 9 explains the percentage of decision making process by the different defined groups for EL solutions. Managerial level plays a significant role in EL in KKU. Fig 10: This data analysis is done just to know the interviewee duration of association with E-Learning. This analysis was important to justify the dependence and accuracy of information taken from the respondents. Fig 11: Give evidence that, for now quality in EL is widely prevalent and in the growth stage in KKU. Fig 12: Respondents have medium to advance level of personal understanding of quality, and based on that they use it on online learning environment and on their E-Courses. Fig 13: KKU EL has adopted standards of Quality Matters to realize the quality teaching and educating on virtual learning setting. Fig 14: Survey result shows the high level of importance of

Quality in KKU EL. It applies advance level of quality approach for imparting knowledge and providing information. Data analysis show that EL experts, online instructors and facilitator use advance level of quality approach in its' educational set up. Fig 15 Types of Quality strategies results show that E-Learning focus on students' centric approach and concentrate most on deep learning notion, however due to psychographic reasons learners still focus more on memorizing that result in surface learning. Here quality instruments play a great role, it teaches the methodologies to the instructors how they can use EL tools for achieving deep learning and how they can apply students' centric approach. Fig 16 and Fig 17 offer the reasons on use and non-use of EL tools. It is found that even if El deanship has conducted various training programs and offer appreciating certification for QM and EL applications, yet many instructors are found not self motivated. EL experts have been playing challenging roles in applying QM standards in EL to establish interoperability for the success of KKU El deanship and enhancing the learning systems of KKU at global level.



Fig. 4. Scope of E-Learning

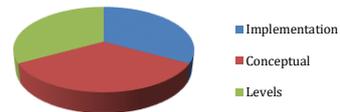


Fig. 5. Types of E-Learning

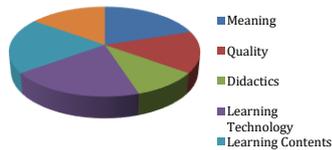


Fig. 6. Domains of E-Learning

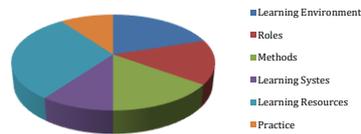


Fig. 7. Entities of E-Learning

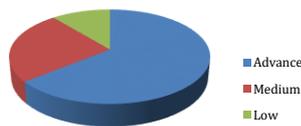


Fig. 8. Involvement in E-Learning

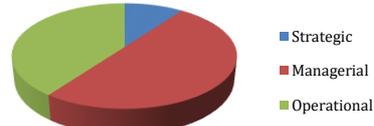


Fig. 9. Roles in E-Learning

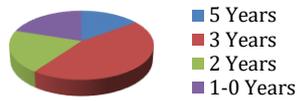


Fig. 10.Length of Involvement in E-Learning

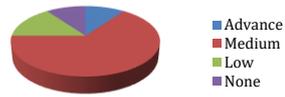


Fig. 11.Involvement with Quality in E-Learning

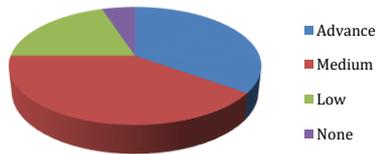


Fig. 12. Personal Understanding of Quality

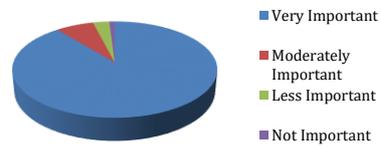


Fig. 13. Importance of Quality in E-Learning

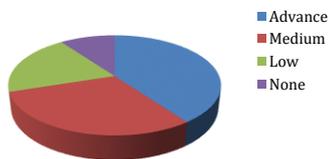


Fig. 14.: Use of Quality Approach

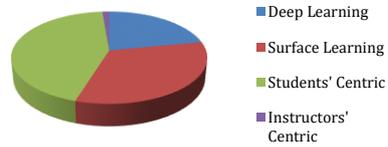


Fig. 15.: Types of Quality Strategy

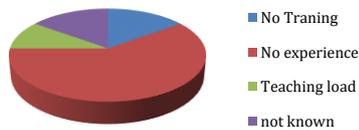


Fig. 16.: Reasons for non-use

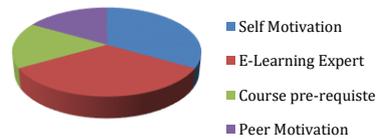


Fig. 17.: Reasons for use of quality strategies

5 Results

In the extended research work it was found that experience with Quality instruments and statistics on demographic played vital roles. Age, Educational qualification and experience motivated the online users to apply Quality instruments in E-Learning education systems and freshers and new scholars are found to be using advance E-Learning tools and Quality reference models.

QD at EL deanship (King Khalid University) was established in the end of 2010. The objective of this department is to create and raise the awareness of quality in E-Learning, especially in the QD of E-Courses and development of E-Course by implementation of quality standards which are vital to achieve the accreditation. Also KKU E-Learning promotes the best practices and stimulates innovation and excellence in online learning and teaching. Besides, the quality department also works at the level of E-Learning program by measuring performance and improvement efforts of the initiatives taken by at the faculty level.

Objectives of KKU E-Learning and Quality are to provide training to the online facilitator and faculty members on the most proficient method to apply E-Courses norms of value, make and actualize the accreditation procedure of the E-Courses quality, measure the productivity, adequacy and students' satisfaction for E-Learning that eventually categorize challenges and advancement openings in E-Learning system and transmit appropriate activities to fill spaces and exploit the open doors for development.

Interoperability between Quality development and E- Learning in King Khalid University is trying to widen. They are having bright and strong intensification attempts to achieve full percentage through Policies and regulations. Interoperability between Quality development and E- Learning in KKU is working well to capture, reuse, and sharing of data, learning objects and other learning resources. Clear Quality development policies and regulations are formulated and broadly understood for E-Learning and currently implemented at the growth level trying and to achieve an advance level.

Also we concluded that policies, regulations and norms for student and faculty online communication, access to online resources, performance assessment, monitoring, quality assurance and privacy, existing policies and practices are mixed and based on traditional as well as online learning but rapidly progressing in improving and expected to reach to the best standard of online learning in the near future.

6 Conclusion

This research broadens the information on interoperability of E-Learning and quality development King Khalid University. There are bright Prospects and Strategies for the Improvement the acceptance and usage of E-Learning and development of interoperability at all levels. This will promote implementation of Quality development in King Khalid University.

7 Acknowledgement

We would like to thank Almighty Allah for his mercy, and we would like to extend our gratitude to the previous authors, Dr. Mohammad Rashid Hussain, Dr. Quadri Noorul hasan Naveed, Dr. Naim Ahmad, Dr. Shamimul Qamar, Dr. Nawsher Khan and Ms. Toleen Abu Hwejj, who contributed in the previous version of this paper.

8 References

- [1] Definition of E-Learning and Description of E-Learning , ET Financial daily (Available on <https://economictimes.indiatimes.com/definition/e-learning>)
- [2] E-Learning concepts trends and Application (Available on <https://www.talentlms.com/elearning/history-of-elearning>)
- [3] Stracke, Christian M. (2006): "Interoperability and Quality Development in e-Learning: Overview and Reference Model for e-Learning Standards"; in: Proceedings of the Asia-Europe-Learning Colloquy. Seoul (Korea). (Also available online: <http://www.qed-info.de/downloads>)
- [4] The history of e-learning (Available on <https://www.talentlms.com/elearning/history-of-elearning>)
- [5] Stracke, Christian (2013) Competence Modelling for Innovations and Quality Development in E-Learning: Towards learning outcome orientation by competence models. (Available on <https://duepublico.uni-duisburg-essen.de/servlets/DocumentServlet?id=31527>)
- [6] E-Learning Standard- what they are and why by John Black, November 14'2015. (Available on <https://www.trivantis.com/blog/elearning-standards-matter>)
- [7] Interoperability and Quality Development in e-Learning: Overview and Reference Model for e-Learning Standards, (Available on <https://duepublico.uni-duisburg-essen.de/servlets/DocumentServlet?id=31533>)
- [8] Eugenia Smyrnova-Trybulska University of Silesia in Katowice, Poland E-Learning And Open Education Quality – Some European And National Standards And Regulations (Available on <https://depot.ceon.pl/handle/123456789/13246>)
- [9] Insung Jung 25 September 2010 The dimensions of e-learning quality: from the learner's perspective Educational Technology Research and Development August 2011, Volume 59, Issue 4, pp 445–464 (Available on <https://link.springer.com/article/10.1007/s11423-010-9171-4>). <https://doi.org/10.1007/s11423-010-9171-4>
- [10] Norm Friesen, CanCore Initiative Athabasca University, Athabasca, Canada Interoperability and Learning Objects: An Overview of E-Learning Standardization Interdisciplinary Journal of Knowledge and Learning Objects Volume 1, 2005 (Available on <https://pdfs.semanticscholar.org>)
- [11] A.M. Bianco, M. De Marisco, M. Termpnerini, Standards of E-Learning QUIS - Quality, Interoperability and Standards in e-learning (Available http://www2.tisip.no/quis/public_files/wp5-standards-for-elearning.pdf)
- [12] E-Learning Mission, Vision, E-Course, Course Development, E-Learning initiatives, Quality Matters (Available on <https://elearning.kku.edu.sa>)
- [13] Terry T. Kidd, A Brief History of E-Learning, Texas A& M University, USA (Available on <http://www.igi-global.com/gateway/book>)

- [14] E. Olejarczuk, The E-Learning component of a blended learning course, Volume 14 Issue3 (Pages 58-68), Journal of Teaching English with Technology (Available on <http://www.tewtjournal.org>)
- [15] S. Senfert, U. Lecher, K. Stanoevska, A reference model for online learning communities, (Year 2002), Volume 1, Issue 1(Pages 43-55), International Journal of Educational Telecommunications.

9 Authors

Dr. Arshi Naim , Quality Coordinator, College of Computer Science, King Khalid University, Abha, Kingdom of Saudi Arabia. I earned PhD degree in Business Management. My area of interest is Business Management, Electronic Commerce, ECRM, E-learning, Quality Standards and Accreditation Processes, Learning and teaching developments, learning outcomes developments. I am reviewer for established programs and new programs in the University; also I am a peer reviewer for E-Courses as per Quality Matters standards. (Email: arshi@kku.edu.sa)

Dr. Fahad Alahmari, E-Learning Dean and Assistant Professor in the College of Computer Science, King Khalid University, Abha, KSA. Dr.Alahmari holds PhD (2015) in Computer Science from RMIT University- Australia. He is also certified in Design Thinking and the Art of innovation from Stanford University (2016) (Email: fahad@kku.edu.sa)

Article submitted 2019-08-31. Resubmitted 2019-09-24. Final acceptance 2019-09-24. Final version published as submitted by the authors.