

Quality Assurance in E-Learning: Study of E-Learning Practices in Pakistan

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Abstract: In educational institutions and corporate environments e-learning is becoming an increasingly important teaching and learning mode. The quality evaluation in e-learning is very important for making courses taught in this mode at par with that of formal education. This paper comprises of different dimensions of e-learning and explains how quality management plays a vital role in the success of e-learning. It also examines the practices and trends in quality assurance on the basis of case studies conducted at national and international universities. E-learning approaches used in Pakistan and efforts of Higher Education Commission (HEC) in order to make improvements in the process of providing quality e-learning have also been discussed. This paper presents quality assurance model used at COMSATS Institute of Information Technology Virtual campus along with its performance indicators and implementation.

Key words: E-learning • Distance education • Quality assurance

INTRODUCTION

Today, we live in a world that is more connected through use of information and communication technologies (ICT). Increasing integration of technology in our daily life is a catalyst to globalization. This in turn is affecting demography and economic conditions worldwide. The human and social development processes however are still not alike amongst different countries. This divide is more visible between developing and developed world. Limitations in use of latest information and communication technologies and access to latest knowledgebase are one of the major reasons for this diversity. Inability to effectively use the technology is slowing the social and economic development in developing parts of world. Better learning from the experiences of developed world and improved coordination among peers can greatly enhance the pace of development. The idea of ICT enabled learning is initiated at developed world, technology is used to mobilize well informed and better educated communities. The idea of electronic/e-learning was introduced to better educate the masses about advances in knowledge and

opportunities available globally. The idea although is not intended for direct influence on economy or growth of country, it proved very useful in bridging the gap between developing and developed extremes. Improved access education and extension in outreach of information helps in evolution of societies. The e-learning being lesser resource intensive compared to conventional means of information dissemination, is becoming preferred choice of learning tool across the globe.

Evolving from its predecessor i.e. distance learning the e-learning model has attracted interest of many mainly because of the flexibility it offers in time and distance boundaries. It is not much of a surprise to see more and more organizations in addition to educational institutes, venturing into the e-learning market. The global market for e-learning reached 90 billion USD in 2002 [1]. E-learning approach today encompasses many aspects of pre-digital era distance learning approach; it now is a blend of learner and tutor centric models. The more recent delivery models also cover both synchronous and a-synchronous learning modes. Modern e-learning is not restricted to teacher and learner alone; it covers many different users, content producers, moderators and service providers [2].

Widespread penetration of e-learning in education and industry with continuous evolution to cater for the transition in way we educate ourselves, suggests its bright future. The popularity of e-learning is not just limited to working adults who are in search of higher qualifications without losing their earning power and leaving their jobs [3]. This trend seems ever increasing as the computer technology and Internet has become widespread. These days mobile computing devices, (smart phones, tablets) are becoming common; access to broadband internet is improving not only in educational, business environment but is good connectivity is making its ways in urban and as well as rural domestic regions. Research revealed that 16 to 18 year old teenagers are really keen towards electronic learning or on-line learning [3].

Lots of studies have been conducted to assess the impact of e-learning [4-9]. Research results showed that there is no universally accepted definition of what an electronic-learning is, as practitioners and authors use the term interchangeably according to their own individual needs[10]. This has resulted in number of contradicting definitions being made by different scholars [11, 12]. According to this paper the author will use the definition put forward from the Higher Education Funding Council for England (HEFCE) (2005:5) [13] “e-learning is any learning experience supported by information and communication technologies (ICTs)”.

E-Learning Other Definitions: [14-17] refer to e-learning as “communication and learning activities through computers and networks (or via electronic means)”. To be more specific, [18] Fry (2000) defines e-learning as “delivery of training and education via networked interactivity and a range of other knowledge collection and distribution technologies.” [19] also had the same definition as Fry’s – they defined e-learning as “the creation and delivery of knowledge via online services in the form of information, communication, education and training”. [20] stated that “e-learning is a self-directed learning that is based on technology, especially web-based technology”. He also stressed that “e-learning is collaborative learning. Internet and web technology is important in e-learning”. [21] defines e-learning as “the use of Internet and digital technologies to create experience that educate fellow human beings.” Apart from web-based technology, electronic-learning seemed to have need of multimedia based courseware [22, 23].

Hence, it can be safely stated that the e-learning processes are information and communication technology centric. The learning process in this type of education is dependent on good technology infrastructure, convenient user-device interface and general acceptability of technology in society at large. It is not surprising that [24] and [25] mentioned that “e-learning evolved around Information Technology to enhance the learning performance and efficiency”. Moreover, [22] explained what means of technology can facilitate the e-learning. This can include pre-recorded videos, live video conferencing, computer two-way collaboration platform, wired and satellite downlinks for interconnections. Research provided many good examples of learning activities that involved ICT [26]. The examples include learning from e-mail, online discussion, online research and coaching through electronic-mail. On the basis of above definitions and examples, we can further define e-learning as learning process supported by the use of computing devices, network technologies and multimedia contents.

In higher education Quality Assurance (QA) is of great importance, in case of e-learning the importance of quality assurance is a major concern of all the stakeholder. Professional institutions like Quality Assurance Agency (QAA) in the UK and the US Institute for Higher Education Policy (IHEP) provide detailed guidelines for incorporating quality assurance procedures in the academic process. Daniel *et al.* point out that the IHEP developed 24 benchmarks that covers the areas of course structure, course development, institutional support, student support, teaching and learning, evaluation and assessment [10]. The categories covered in guidelines provided by QAA are program design, system design, student development and support, management of programmed delivery, student communication and assessment.

The quality assurance terminology used in education is often referred to in general sense that covers monitoring, auditing, evaluation, accreditation and other review elements [27, 28].

The educational institutes in general practice two variants of quality assurance mechanism, i.e. internal and external QA system. The internal system refers to the assessment of quality in student learning experience; while the external QA system gauges the outcomes of teaching practices.

Quality in the Success of Electronic Learning: Quality plays a pivotal role in the success of e-learning. For educational institutes, evaluation of learning contents, streamlining academic process and certification of programs is becoming a necessity to survive in competing environment. Quality management in any institute means defining a through framework that oversee the complete organizational processes and agrees on and list performance indicators to measure the goodness of any activity. Such a framework insures a certain level of quality that must be maintained. While on the other side quality control mechanism is to detect flaws and prevent them from happening. Assessment of quality in education is not merely possible by use of classical approach of quality assurance based on standard based quality management. Assessment and assurance of quality in academics is possible only by using continuous monitoring and feedback system based on well defined performance indicators. This approach is used to attain level of individualized assessment for complete learning activity. Quality of anything is often associated with comparison or conformity of already set standards in that domain. In education domain this approach is useful at institutional level or at program level. However in addition to this traditional concept of quality assurance, another relative approach of quality assessment and assurance can also be used in a development oriented way. This can be achieved through a system to provide timely feedback to all stakeholders of a system. The on the go self-evaluation, peer-review, involvement indicators during learning process can significantly enhance the performance of learning environment. The study of relevant literatures on quality in academia indicates that academic quality needs to cover a lot more than mere conformity checks on defined standards. It is indicated by researchers that there are a number of pedagogical ways of perceiving quality in education domain [29]. Studies on topic of quality in education conclude that quality is a philosophical term [30]. Point of quality being a relative term which has to be more closely defined relates to the values of different pressure groups. It shows that they talk about quality in relative term, which has to be organized as a negotiation process in the relation between stakeholders [30, 29]. Research findings emphasize that “quality is not a characteristic of an educational process that can be observed generally rather; it is the result of an assessment” [31]. It is important to note that quality in academics may not refer to classification of good

institutes, or good programs or learning model. The quality in education must relate to the conformity to defined value systems, progress of learning processes and intrinsic/extrinsic result comparisons [32]. A research on quality in education suggests that defining assessment criteria for every stakeholder cannot guaranty a good assessment of quality. It is important to consider context of review and take into consideration the complete environment and limitation of assessee and assessor [29]. In case of e-learning to accomplish best of quality assurance, understanding the complete context and adjusting review process is of paramount importance.

Detailed questionnaires and performance indication factors needs to be crafted that relates to development of learning content, methods of delivery, methods of educational assessment, technology components, learning management system, facilitation partners and recognition in community. In brief the quality management in e-learning is more exhaustive compared to conventional education and one needs to carefully see the role of feedback, reflection and recommendation in quality development and assurance.

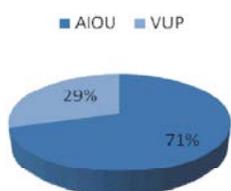
Electronic-Learning in Pakistan: Pakistan is a developing and multilingual country and has become the second largest economy in South Asia and having total population of 167 million [33]. The state government and policy makers have accepted the importance of education and implemented lots of educational plans and procedures, since 1947 [33] These initiatives have all been efforts to promote, help and enhance the education level in Pakistan. Yet these efforts have not yielded any gains for the people. E-learning is not a new trend in Pakistan [7] There are many institutions that are offering distance learning programs partially using e-learning approach.. For example, Allama Iqbal Open University (AIOU) was the first of its kind that is offering distance learning [34]. In addition, another University was set up (named Virtual University) in 2002 to meet the huge gap between intermediate pass outs and university registered students [35] Virtual University of Pakistan introduced a lot of e-learning techniques into the country. The purpose was twofold i.e. to increase coverage of higher education and to combine ICT with teaching pedagogies in the country [36]. VUP delivers the lectures and provide education through internet and broadcast television.

Table 1: Shows the number of campuses of both universities in Pakistan (Regional offices of AIOU" (<http://www.aiou.edu.pk/RegionalOffices.asp>), (Virtual campuses" <http://www.vu.edu.pk/>).

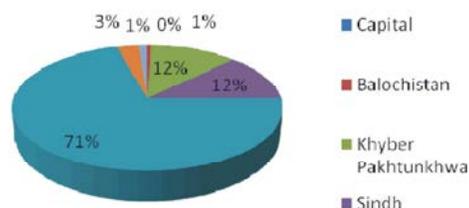
Sr.No.	University	Name No. of own Campuses	No. of Affiliated Institutes
1	AIOU	36	None
2	VUP	15	168
Total Campuses		51	168
Grand Total		219	

Table 2: Shows the number of campuses of VU area wise in Pakistan (Virtual campuses "http://www.vu.edu.pk/)

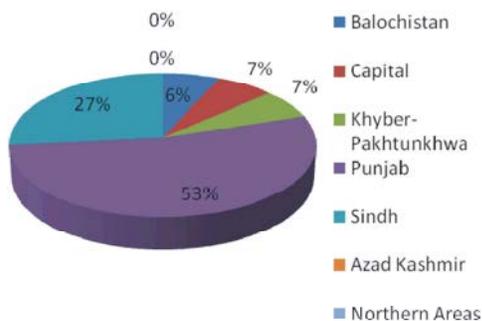
Sr. No. Area	No. of own campuses	No. of affiliated campuses
01 Balochistan	01	01
02 Capital	01	0
03 Khyber-Pakhtunkhwa	01	20
04 Punjab	08	119
05 Sindh	04	21
06 Azad Kashmir	0	05
07 Northern Areas	0	02
Total	15	168
Grand Total	183	



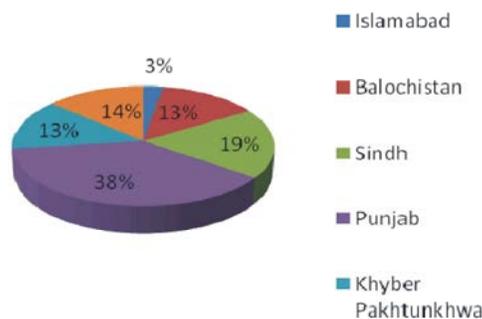
Graph 1: Shows percentage of owned campuses of AIOU and VUP in Pakistan



Graph 4: Shows percentage of affiliated campuses of VUP area wise in Pakistan



Graph 2: Shows percentage of owned campuses of VUP area wise in Pakistan



Graph 3: Percentage of owned campuses of AIOU region wise in Pakistan

E-Learning Approaches in Pakistan: Government of Pakistan realize the potentials of e-learning and gives due importance to mode of education at all levels. The policy makers realize that this approach can be beneficial in elimination of high illiteracy at grass root level. This approach is extremely important in enhancing skill level of existing work force in our country. It was becoming evident to the Looking at the infrastructural resource constraints and population, the Govt. of Pakistan by the year 2000 has a clear understanding that the dream of education for all can only be a reality when unconventional means of education delivery complement the conventional education system of country. It is a global practice to bridge the education opportunities and demand gap through the use of e-learning. Some of the efficiencies that are there in conventional system and that can be reasonably addressed by e-learning include.

- High education cost especially through conventional means
- From school to university level there is acute shortage of highly quality faculty.

- Social factors restricting certain people to go to other cities.
- Most of higher education institutes are situated in urban parts of country.

Among the policy makers this was a common understanding that the phenomena of e-learning will create more synergies among the existing established infrastructure and will significantly contribute towards the sustainable development. Foreseeing this potential of e-learning Govt. of Pakistan invested great deal of resources in information technology infrastructure. A Virtual University and National ICT R&D Fund was developed with an aim of supporting lifelong learning, education for all and development of information and communication technology support system in Pakistan.

In recent past, Pakistan has witnessed a tremendous growth in communication and information technology sector. The country has also shown its potential in education sector through its bright students performing very well internationally. United Nations Industrial Development Organization (UNIDO) supports multidimensional initiatives across the developing world for sustainable economic & industrial development, environmental protection, poverty alleviation and human resources development by promoting the transfer of technology. UNIDO in collaboration with Ministry of Science and Technology Pakistan developed a roadmap for technology enhanced learning in country. This effort materialized in form of Virtual University of Pakistan that is considered to be the pioneer in modern e-learning education. The Virtual University of Pakistan offers degree programs in various disciplines at undergraduate and graduate level. The different subject areas covered by these programs include Commerce, Computer Science, Business Administration, Psychology and Public Administration. Besides regular degree programs the university is also facilitating students with professional certificate courses and short term diplomas. The university follows a hybrid model of e-learning. It has a number of local campuses in different district headquarters of the country. Besides it own maintained campuses, Virtual University has association with many private institutions in cities around the country. Virtual University of Pakistan use them as student facilitation campuses where the student can use the internet to access university's Learning Management System (LMS) and watch the lesson on affiliated TV channels [37].

A survey conducted to observe the student attitude towards the e-learning in Pakistan shows positive feedback in favor of this mode of education. Study was conducted from a sample of 431 participants who are Bachelor of Computer Science students at Virtual University of Pakistan. Following are some of the important finding of the case study [38].

The report findings show that 89 percent of the students agreed with the statement that that virtual education effectively is giving alternate opportunities to conventional higher education system in country. Considerable number of the respondents i.e. 94% had the opinion that the online education is indispensable to keep the pace with the learning developments across the globe, especially in the field of education and training, information technology etc. Approximately 86% of respondents agreed with the statement that online education and e-learning tools helps in improving the learning process. Study results also indicates that most of the respondents (around 88%) were of the view that online education can help devise a uniform education system across country this can include uniform curricula and a similar assessment system. Likewise 85% of the survey participants were convinced that e-learning or online education can acts as social change agent that can induce cross cultural values and 94% of the participating students agreed that cultural values can be enriched through online education and most of the respondents had the opinion that online teaching staff give positive feedback and constructive remarks on assignments [39].

Efforts Done by HEC and National ICT R&D Fund: HEC (Higher Education Commission Pakistan) is the major stakeholder at higher education level in country. HEC has initiated a project of "Online Lecturing and Net-Meeting using IP-based Video Conferencing System". This initiative provides state of the art video conferencing facility at all public sector universities. Through this project HEC and a number of universities in country has established world class video conferencing lecture room. 18 public sector universities initially participated in this project. The video contents recorded and relayed through this system were meant to nurture the core concepts about subjects. It also intended to improve critical thinking at graduate and under graduate level by discussions on cutting edge technologies and research work among student and faculty members. The project includes supply, integration, installation, commissioning,

testing and maintenance/support of fully functional video conferencing system with the collaborative tools in order to enhance the students-teacher interaction by distance learning [41, 36]. The first phase started in September, 2006 renowned scholars from Pakistan delivered interactive talks on a variety of topics. Recorded lectures acquired from foreign universities were also broadcasted. It was decided that in the second stage live lectures with interactive sessions from subject specialists abroad will also be arranged. This program continued to progress and gradually the remaining 32 universities started becoming part of program n phase 2. The main philosophy behind the establishment of video conferencing facility is to improve the student teacher communication, meet the shortage of faculty at institutes that are located far-flung and struggling to keep good teachers. This effort was meant to bridge the gap of good faculty and eventually boost the standard of education in Pakistan. In January 2007 National ICT R&D Fund was constituted by ministry of science and technology of Pakistan [42]. The motive behind its establishment was to transform economy of Pakistan into a knowledge-based economy by exploiting ICT tools efficiently. The ICT R&D Fund invited the proposals and projects from the academic institutions and professional technology companies. This was done to develop state of art e-learning and academic assessment system to teach basic and applied science subjects and other courses to the students of level 9 and 10. The courses were to be developed in both Urdu and English language. This was another important step towards the promotion of e-learning and also a step forward in education for all cause.

Practices and Trends in Q.A (Case Studies with International and National Universities): Case study about the Indonesia Open University is very enlightening and at the same time relevant to our context. It describes the background and the steps involved in building a system for quality assurance. The study includes development of job manuals, methods of internal as well as external evaluation, ways defined to raise understanding of jobs and how to improve level of dedication amongst the workforce and standardization [43]. The authors in this study emphasized on quality in open and distance learning environments. It covers different facets of distance and online education including pedagogical practices, delivery methods and production mechanism.

More research published in similar areas in which authors exemplified the quality assurance framework, one can compare the existing frameworks practiced all over the world [44, 45]. This research in particular gives a checklist, which maps the regions that a quality assurance system must cover to work effectively [44]. This work highlights a policy for quality management, definitions of standards, identification of key processes, levels of participation and inputs by users, documentation, parameters for staff training and associated expenses. A research revealed what methodologies are used for managing quality in open and distance learning and compares them with those that are developed for business and industry. We also studied research work that examines the identical elements between the quality assurance frame works in USA, Canada, UK and Australia [45]. The author points to these commonalities and shows educational objectives, provides sustainable institutional obligations for student support, engagement and promotion of collaborative processes. The whole eco system of quality management in education contributes to improve the student teacher learning experience.

Case-Study (National): lthough the government of Pakistan remained at forefront of major e-learning initiative in country, the corporate sector, civil society, nonprofit and foreign funded NGO segment also contributed significantly in this area. Some examples include UNIDO, USAID, Teletaleem, College of Information and Management Sciences (CIMS), that was a project of World Online, ICC, Cybersoft Technologies, WCN and the World Bank [46] Another project of e-learning knowledge transfer was initiated through collaboration of CHIT, VUP, University of Central Lancashire Seledia-Center for Erhvsuddannelse, Burnley Telematics and Teleworking Centre Ltd. The project was part of ASIA IT&C scheme and its main aim was to share knowledge of e-learning experiences in higher education vocational educational and continuing education programs [47]. To look into deeper into the project-level problems of different e-learning platforms, the next section will deal with the case-study of a unique language electronic-learning platform.

French Online Distance Learning Program: French online another noticeable project of e-learning in country, the project provides the French language learning facility to individuals over the internet. The project was started

and supported by French Embassy in Pakistan; it is mainly developed and managed by Alliance Française (AF) Islamabad. Other major collaborative partner in this project includes COMSATS (Commission on Science and Technology for Sustainable Development in the South). The purpose of launching this platform, which started operations in 2003, was to handle ever increasing requirement of French Language training to remote areas of country where formal training institutes and tutors are not available. It is also meant to facilitate professionals who can not study full time due to busy work schedules. French Online program is a mix of conventional classroom and e-learning. It is being offered in 9 cities of Pakistan. The e-learning platform allows learners to study with convenience of selecting their own time and place. The tailored e-learning system helps students and teachers maintain consistent level of interaction through online discussion forums and electronic messaging. Furthermore at the end of every module a workshop is organized at partner institutes or at AF Islamabad, this gives learners a chance to improve their verbal skills by real life interaction with teachers and peers [48].

Course Structure: This program consists of two levels of studies named beginner and advance. Each of these levels is comprised of 4-5 modules. The student is provided with a printed workbook for writing skill exercises. A compact disk with multimedia contents is also provided to help in vocabulary building and verbal skills. Learner and teacher meet fortnightly through on campus workshops and at online forums. Student progress to next level by passing exams conducted at the end of each teaching session of a particular level.

E-Learning Platform: French online program started with the Web CT and later tried the use of IBM LMS software. However soon the need for custom designed learning management system was realized. To cater for the unique requirements of the program an e-learning platform was developed. At user end an internet enabled computing device with (Java enabled) browser is needed.

At learner level a users login to view schedule of learning activity, messages from teachers and peers, academic progress information, participate in general discussion forums. The multimedia course contents are also available to students. Tutor level console of system has management features of learning environment and access to students progress/files.

Content Development: Learning content and assessment material was developed by qualified teachers and native French language speakers. Special attention was given to synchronize audio-text and visual content so that technology is in complete harmony with learning objectives. The contents were developed in standard digital formats and can be accessed using moderate internet connectivity.

Challenges Confronted in Initial Stages: The learning content for e-learning platform was developed using format that requires special formats to play. At times the streaming technology also created issues for persistent delivery of learning material to students. This was overcome by using media formats that are encoded using high compression techniques and can be played using commonly available software.

Persisting Challenges: The internet connectivity and network infrastructure is still the biggest challenge faced by online learners. The broadband connectivity is gradually making its ways in urban areas of country however the majority in smaller cities and rural areas are still struggling with dialup lines. The technology awareness and access to original software is also hurdle in making best use of e-learning systems.

Lessons Learnt for the Promotion of E-Learning: Following important considerations came from various e-learning experiments conducted in Pakistan:

Lack of technical resources and limitations of infrastructure is the prime hindrance in promotion of e-learning in country. Out of 100 inhabitants a very disappointing ratio of 7.5 has the access to internet. Efforts are needed to pick the pace of building reliable and speedy communication infrastructure. At national level institutions should come forward to support e-learning programs. Existing universities must come forward with innovative e-learning programs and go beyond brick and mortar model. Higher Education Commission (HEC) of Pakistan has taken very positive steps towards this goal. Computer literacy is another prime hurdle in promotion of e-learning in country. Technology awareness is at a minimum level in public at large [49]. Government of Pakistan and education governing bodies are taking steps to promote affordable ICT education and introducing Open Source Software (OSS). Another initiative by HEC is facilitation in earning International Computer Driving

License (ICDL), which will boost the computer literacy in Pakistan [41]. Lack of English language skills is another factor that comes in way of effective use of technology and e-learning initiatives in country. Even the majority of very small literate population of country is not versant with the use of English language. Since most of learning contents available online and software, tools for e-learning are English based, the use of all these technologies is limited. Efforts are required to either promote understanding of international language along with content and e-learning platform translations to Urdu language. The role of CRULP (Centre for Research in Urdu Language Processing), is vital in this regard. The use of techniques such as self regulating study models and support for students with disabilities is very essential to make best use of e-learning platforms. One such example is IMPROVE method [50]. It supports mathematics learners by using four categories of self-metacognitive questioning. This includes constructing connections amongst previous and new knowledgebase, developing better understanding of the problem and use of best fitting strategies to resolve the problem [51].

Quality Assurance in E-Learning: PDPP Evaluation Model and its Application Through Case Study of the University of Hong Kong:

The 4 phase model based on planning, development, process, & product evaluation (PDPP) is suggested for the evaluation of e-learning environments. This model is derived from CIPP (Context, Input, Process and Product) evaluation model. The PDPP model encompasses process and characteristics of e-learning systems, a total of 26 elements were described for evaluation purposes. In this study author took e-learning courses for analysis and definition of evaluation activity chain. The results of this research show effectiveness of PDPP evaluation model in terms of measuring learning and tutoring in online education. Although the PDPP model use in this study is restricted to a particular institute and specific course and method, the author believe that results for this implementation can be a good reference for development of e-learning quality assurance models for other institutes.

E-learning has evolved into a very useful and in some cases preferred mode of training and learning in corporate sector as well as educational institutes. Great importance is given to evaluation of e-learning through PDPP model. Planning stage evaluation includes identification of target student segment, market demand, course objectives and associated financial liabilities. The development stage

evaluation focuses on instructional model, course portal, user interface, course content, flexibility of delivery system, interaction and feedback, student and teacher support services and assessment mechanism. Evaluation step includes measuring overall satisfaction during learning process, effectiveness of support services. The product level evaluation involves level of learner satisfaction, effectiveness of teaching and sustainability and scalability of system. In a practical experiment an e-learning course on Research Methods in Distance Education is prepared by School of Professional and Continuing Education at the University of Hong Kong. The course was jointly offered with School of Distance Learning for Medical Education of Peking University. This course was used in this research as case study. Students from main land China, Macau, Malaysia and Honk Kong were enrolled for this course. Through a survey about the e-learning experience, a large number of registered students were more than satisfied. A sizeable student body even rated the effectiveness of e-learning course to be equivalent and in some cases even better than the conventional face to face learning. The strengths indicated for this approach were student centered learning model, more collaborative elements through use of system, flexibility and availability of learning material. This study revealed that use of systematic evaluation (such as PDPP) of e-learning process can greatly enhance its usefulness.

The research by this study finds that many institutions use the same quality measuring criteria for e-learning as for the other conventional modes of education [52]. This research indicates that novice e-learning operators cannot perceive the detailed aspects of quality assurance in this mode of education [53]. It is very important to define and adapt standards of quality especially for internal processes [54]. This course and its study lasted 10 week with an average of 8 hours of study per week. Complete teaching and learning activity i.e. courseware, assignments, quizzes and discussion sessions took place in e-learning format. The student learning process includes reading of course guide, understanding of course objective, viewing video lectures, review of refernced text books, participation in online discussion forums and online submit assignments.

Learning Outcomes: The surveys conducted in this study contain qualitative comments from students who participated. In short students expressed following two additional benefits of this mode besides the learning itself: first is the knowledge of e-learning system that they can

use to develop their own learning contents online. Second is the opportunities and links developed through this system with peers in different places.

Proposed methodologies for quality assurance in electronic-learning:

For the assurance of quality in open and distance education in Pakistan, it is recommended that.

- Mandatory training of ICT systems and programs should be given to teachers in distance learning programs in order to give them practical and functional knowledge of the internet, computer and allied areas of ICT.
- Providers of e-learning must make efforts to use reliable and quality ICT software and hardware, supported by highly skilled support personnel having skills that are needed for smooth running of system.
- The Government of Pakistan must realize that it should not only allow and promote the e-learning but should also provide adequate funds to support them.
- The government must also ensure that the electric power supply in the country is made available round the clock. Rural areas must be supplied with electricity since a large number of prospective students of the e-learning belong to rural areas.
- In the designing of course contents and learning materials the quality circle approach should be adopted.
- In open and distance learning programs, on-line assessment of students work and proctored examination at the end of course must be encouraged to maintain confidence and reliability of system.

CIIT Quality Assurance: Investing in Quality, based on the ownership of quality assurance processes and quality enhancement practices in order to deliver high quality education, COMSATS Institute of Information and Technology (CIIT) Pakistan is becoming a world premiere higher education institution. COMSATS is dedicated to maintain an academically rich, quality-oriented, research based and scholarship system in the university that makes sure its quality assurance regimen and reflects it's strategic Vision (2020) and is also in strict accordance with the international quality assurance standards.

CIIT manifested its progressive mission by the establishment of the Quality Enhancement Cell (QEC) in 2007, with Quality as its integer and Excellence in higher education as a qualitative strategic imperative and since then, has taken brave initiatives for the attainment and

management quality at the institutional level in all its cadres as university management, administration and academic. The Quality Enhancement Cell (QEC) is an important component of CIIT management and is clearly associated with the Quality Assurance Agency of the Higher Education Commission of Pakistan, for implementing the quality assurance policies and monitoring the academic programs in order to make sure that the quality standards are well-met.

The basic objective of Quality Enhancement Cell (QEC) is to smooth the progress of the implementation of QA practices and procedure and also ensure quality enhancement at the institutional level so that with constant improvement of strategies, resolute action and effort, the criteria of quality in all aspects of the university that influence the quality of research and learning and, availability of competent and experienced staff and faculty and its incessant capacity building in terms of competitive excellence in quality learning and teaching which has updated curricula that meets the advances in subjects, improved technology and infrastructure, maintaining research culture that produces outstanding research and accreditation and assessment of programs, effective and efficient international collaborations that promote the broadest range of intellectual explorations and produce intellectually and academically bright and scholarly researchers and students, helps CIIT to gain international compatibility and competitiveness amongst the top universities in Pakistan.

In order to take an integrated approach for quality assurance, assessment and accreditation of academic programs and for enhancing quality for nonstop development at institutional level, QEC of CIIT has taken the initiative about starting the Internal Institutional Performance Evaluation i-e IIPE processes at all of its campuses in 2011 and to fulfill this objective, CIIT has conducted a holistic baseline study for investigating the present status of QA practices that are based on 11 Standards of IPE that are Mission and Goals, Planning and Evaluation, Government and Organization and students, Integrity, Faculty, IR i-e Institutional Resources, Public Disclosure and Transparency, Academic Programs and Curricula, Assessment and Quality Assurance and Student Support Services as well. With this effort of QEC, CIIT became the first institution that has created a uniform quality management system that engages integrates the university management with QA of QEC for successful implementation of it in all the seven campuses (Sahiwal, Lahore, Vehari, Islamabad, Attock, Wah and Abbottabad).

With this reason of commitment and increasing recognition of all stakeholders that Quality Assurance and Quality Enhancement are essential for the improvement of quality, QEC has started the Assessment processes of seven campuses based on 108 programs and that includes an exhaustive exercise of writing SARs (Self Assessment Reports) by the programs, preparation of Assessment Teams and their visits for usual review and follow up in implementation plans by Quality Enhancement cell (QEC) resulting in the online system for the conduction of Assessment Surveys that are used in SARs for analysis purpose. On the basis of evaluation of external performance by HEC, I recognized that Quality Enhancement Cell (QEC) of COMSATS Institute of Information Technology (CIIT) has been placed in the top group of 'W' in the universities ranking of QECs all over the country. Another achievement of the QEC of CIIT is its outreach to HEC and many other universities to impart quality assurance and quality awareness practices to the faculty, administration and the management of university. The effect of implementation of QA practices is evident from CIIT getting the first position in Computer Science and Information Technology category and has got ninth position among 132 universities of the country in ranking overall. Its sustained and continued impact encourages QEC to present CIIT's case at the international ranking forum and also encourages them for the participation in world rankings and to get THE-QS World Top Universities Ranking amongst Top Universities of the world. ISO Certification is another big accomplishment that was decided in 2011 and its continuation after the first Annual Surveillance Audit in September (2012) and also the membership of international Associations or Networks that dealt with the education quality i-e, Asia-Pacific Quality Network, International Network for Quality Assurance Agency in Higher Education, Talloires Network. CIIT's joining of international professional organizations is a incessant source of getting updated information regarding to the advancement in the area of education quality management which inspires the institution for further improvement and enhancement in its quality in order to provide quality services and education to the students.

The management of COMSATS dedicated to safeguarding our core values like students' right to get high quality education, exploration, freedom of expression and creative innovations and the accommodation of substitute ideas and views. Through the implementation of QA and QE practices and processes these values are being fostered under the support of the QEC i.e Quality Enhancement Cell and this would take us closer to our

envisaged place among the top higher education institutions all over world. And will also get us closer to our dream of opening external CIIT campuses ahead of our borders in the near future.

COMSATS Institute of Information Technology – Virtual Campus is an extension of an already nationally established Higher Education Institution ranked Number One (1) for Information Technology by the Higher Education Commission of Pakistan. The concept was materialized to promote accessible and affordable higher education through distance learning – even to the remotest areas of the country.

ICT has influenced the development of technology-based model of supply and learner friendly distance education to substitute former print-based and multi-media delivery modes. ICT is also transmuting conventional universities, as learning methods become more flexible and the merger of face-to-face and distance modes of delivery permit them to operate as multi-purpose institutions. The handiness of new technologies gave rise to an increased number of private institutes of higher education, both not-for-profit and for-profit, leading to improved range of on-line programs available, higher student numbers and an unmatched heterogeneity of the student population. It has also fuelled an increase in distance and e-learning programs.

To aide this Performance Indicators (PIs) were drafted to be used as an important tool in enabling contribution to the maintenance and enhancement of quality - to conduct organized self-appraisal for continuous quality improvement. The application and use of the Performance Measures are based on a five-point scale. All departments within COMSATS – Virtual Campus can complete a self-assessment of their practices using the PIs and take corrective actions as required. The objective is to embed quality assurance into all institutional activities from planning and design to implementation and to achieve institutional ownership of and commitment to a culture of quality that will lead to quality enhancement and further institutional excellence.

Performance Indicators for Quality Assurance: An institute that aims to use PIs has to indulge in acute self-assessment that stimulates development of a thoughtful quality philosophy, the importance of which can't be subsided whilst dealing with a developing distance learning programme. PIs are the tools to evaluate performance trends in the institution/programme/course aimed to initiate continuous improvement and ensure that they will:

- Provide all-inclusive coverage of the most significant areas of quality;
- Record key aspects of performance;
- Influence on general institutional/program quality advance;
- Replicate institutional realities;
- Emphasize on the effect of institutional practices on students;
- Mirror crucial policy concerns;
- Make sense logically and in practice;
- Record evocative traits of quality provisions;
- Be realistic and implementable.

Performance indicators are constructed on codes which apply generally to higher education, regardless of approach and level and relay those codes/principles to distance learning provision. They are general statements of good practice made in such a way that they safeguard comprehensive coverage of the most relevant domains of quality in distance higher education institutions. Most of the performance indicators are a combination of inputs, processes and outcomes but are largely process based.

Procedure for Self-Assessment: The criteria and standards in the framework can be used with the following procedure to perform the self-assessment of a distance education program or institution.

The PIs are applied to a particular context and performance is recorded against each of the performance indicators after prudently and factually analyzing evidence from pre-defined sources. Performance on each PI can be rated on a five-point scale in which each level is given a numerical weighting (points) and a descriptor:

Fails to meet the Criteria	0
Unsatisfactory	1
Satisfactory	2
Good	3
Excellent	5

The results of the assessment are derived by calculating the points scored on all PIs.

Cumulative performance in each criterion will be the summation of points achieved on each related PI. Whilst considering a single criteria standard, the total points achieved on all PIs within the selected Criteria standard should be counted. Likewise, when the whole program is being assessed, the total points on all PIs related to the program should be taken into consideration. Complete performance on all lengths will be the positioning of the respective total score on a five point scale.

Effective implementation of self-assessment against the criteria and standards using the PIs requires the institution to have an effective data collection and analysis capability both to conduct the initial assessment and to undertake continuous monitoring of the aspects and processes identified for improvement. Staff involved will need training in quality management concepts. Having identified areas for improvement, the institution must be prepared to deploy the appropriate human and financial resources to ensure effective implementation of necessary changes.

CONCLUSION

Quality assurance is vital for the improvement learning effectiveness; it enhances the efficiency and provides the means of public accountability. For meeting the challenges of implementing valuable quality management, organizations must be willing to adapt to changes in its operations and process model. Quality assurance activities must be transparent and clear, it is important that they evaluation process carried out to full extent and should be able to meet the expectations of all stake holders. Criterion to gauge performance of open and distance learning environments must be defined clearly considering the context of learning environments its users and delivery model. Different methods of self-evaluation, peer-evaluation and reflection are to be given due importance in e-learning quality model. Considering the initiatives and support of government and various education management bodies in country it is evident that distance learning initiatives and e-learning has a good level of acceptance at all levels. Efforts are being made to replace the private candidate model at higher education level with a more learning intensive e-learning and hybrid learning model. It is however need of the hour to develop standardized model of evaluation for e-learning setups in country, otherwise the aim of value addition to private and part time student system cannot be completely achieved. We can learn from various international PDPP models and can come up with a localized definition covering all e-learning dimensions. Local institutes such as CIIT Virtual Campus is investing in quality assurance for delivering high quality education, CIIT quality enhancement cell's mission is to foster, ensure and maintain the confidence and satisfaction of public and other stakeholders in terms of quality education through continuous and systematic self-assessment, improvement measures and value addition instruments.

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