Hybrid Model for e-Learning at Virtual University of Pakistan

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Abstract: Virtual University of Pakistan uses hybrid model of education to impart knowledge to the knowledge seeker/students. This model has three basic components namely, physical campuses, lectures broadcast through television network and the mentoring and tutoring of students through the internet. This paper highlights in detail the working of this model and also indicates some issues that were encountered and solution proposed to overcome them.

Keywords: Hybrid Model, Moderated Discussion Board (MDB), Graded Moderated Discussion Board(GMDB), Private Virtual Campuses(PVC)

1. Introduction

By the end of 20th Century, most of the countries all over the world had jumped on the ICT wagon. Some achieved the heights of success while others kept struggling to make a niche for them selves. Pakistan being a progressive nation also took the challenge and started to concentrate on achieving good name in this arena.

However by the year 2000 it was becoming evident to the government of Pakistan that the targeted progress was not being achieved, the major problems identified for this deficiency were:

- Severe shortage of high quality faulty
- Scarcity of seats for the students in the higher education institutions
- High cost of higher education especially IT education
- Higher education institutes located in the urban areas
- Social factors that do not allow certain people to go to other cities

The need of the day was to produce a large number of educated forces within the shortest possible time. The government of Pakistan conducted a feasibility study and the report was presented to the United Nations Development Program's Pakistan Office [Peter T. Knight, Naveed A. Malik, and Asim Iftikhar. 2000]. This report strongly recommended harnessing the power of Information Communication Technology and establishing Virtual IT University of Pakistan, which was later called the Virtual University of Pakistan. This study quickly converted into the project of ministry of science and technology. Pakistan

1.1 The primary concept

The concept of distance learning, e learning and consequently virtual universities has already been used in many countries worldwide. For example University of Philippine Open University (UPOU) established in 1995 uses print, audio, video and online resources to deliver course material to the distance-learning students, and once a month they have tutorials on the learning campuses. The African Virtual University (AVU) established in 1997, use satellite television and Internet to deliver higher education all over Africa. It is working in collaboration with African Universities to identify the program needed for Africa's development. Upon identifying the programs the AVU collaborate with best universities in the world to developing content and delivery through the network to African students.

The idea of AVU was inspirational and the government of Pakistan started looking at this model to see if they could customize it to their own regional needs.

As mentioned above Pakistan has been trying, for couple of decades, to generate niche for itself in the field of software engineering and computer science. For this reason several private institutes have been established to impart the IT education. These institutes have all the necessary infrastructure to impart distance education to e-learners, i.e. Computer laboratories, lecture rooms and internet services, and are located in the length and breadth of the country, hence it was decided to involve the private sector into this venture.

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After the thorough study and analysis, the mode for imparting education was finalized. It was decided that Virtual University will locate and record the lectures delivered by the best faculty available in the country, and even abroad and broadcast these lectures on television network. The private sector partners of virtual university will be given a fair share to let the students utilize the facilities of computer laboratories, classrooms and internet, It will be mandatory for these private sector partners to provide television in each class room. These computer centers will be called the local campuses of virtual university or Private Virtual Campuses. Students from all over Pakistan will be enrolled into this university and they will go to their nearest virtual campus to receive education.

After listening to the lectures students will then go to the computer laboratories where they will connect to the universities online learning management system to get the contents of the lecture and interact with the teaching faculty.

There shall be one hub or head office of the university. At this place all the policies will be made, contents will be developed and telecast and the teaching faculty will be seated behind their workstations trying to educate the massive number of students.

1.2 Launching of the Virtual University of Pakistan (VU)

After the approval of the above-mentioned plan, the government of Pakistan released the funds of about 16 million dollars in November 2001 to launch virtual university of Pakistan. It was started as a project of ministry of science and technology, IT and telecommunication division, currently known as ministry of IT. It was decided that the university would officially start operating from the last week of March 2002. Thus the time provided to the team of Virtual University for developing the infrastructure and the preparation for the initiation was less than five months.

However during these five months the team of less than 15 people located the professors/consultants that would develop the course contents and deliver/record the lectures for the first semester. Private sector partners were contacted and those with best facilities available all over Pakistan were chosen as their local virtual campuses, or Private Virtual Campuses or PVCs. About 28 virtual campuses in 18 cities were established. The structure for the admission fees, university regulations and policies were devised. Private studios for recording and editing were contacted where the initial lectures were delivered. The Pakistan Television Corporation was approached to have a contract to deliver the recorded lecture on Air, The publicity campaign was launched to develop awareness about this new mode of education to the masses and the admission process was initiated

After the seemingly unending and untiring efforts of the VU team, Virtual University of Pakistan was inaugurated on 23rd March 2002 by the President of Pakistan and its first lecture went on air on 2nd April 2002 with enrollment of 500 students from all over Pakistan.

This was a brief introduction to the inception and launching of the Virtual University of Pakistan. In this paper I will highlight the mode of communication and methodology used to deliver real education to virtually every nook and corner of the country and even abroad.

2. Mechanism of imparting knowledge

The model for the delivery of knowledge adopted by Virtual University is termed as Hybrid Model [Saima N. Sherazi 2001]. It is termed as hybrid because it utilizes:

- The facilities of class room and computer laboratories so that students get the chance to interact with each other
- The television network to deliver the recorded lectures to all the knowledge seekers within and beyond the geographical boundaries of the country.
- The Internet so that students can access the courseware and interact with the VU teaching staff.

Thus the model for the best delivery of education, through this mode, is in a triangular form as shown in the Fig-1 below.

We will discus all the above-mentioned components of this model, i.e. *Physical*

Campuses/Private Virtual Campuses, Lectures delivered through TV and Tutoring through Internet. However point number 3, i.e. the tutoring through Internet will be explained in greater depth.

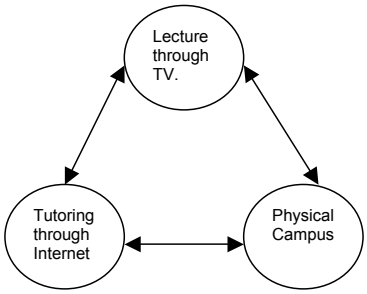


Figure 1: Hybrid mode of education

2.1 Physical campuses/private virtual campuses

It is important to discuss the role of the physical campuses/private virtual campuses in the over all educational requirement of the students. In order for the student to grow and become a useful member of the society he/she should be able to interact positively with its peers and elders. However in the traditional e-learning model students interact with their teaching faculty as well as the other students through cyberspace. This mode of education is very useful, convenient and cost effective but due to the physical distance between its peers, the socializing aspect of the education is missed and later felt when these students have to work in the groups where people are physically present. Keeping this very important aspect of education in mind and the requirement that students need to study in their own hometown, as they have difficulty going to different cities, virtual campuses were opened.

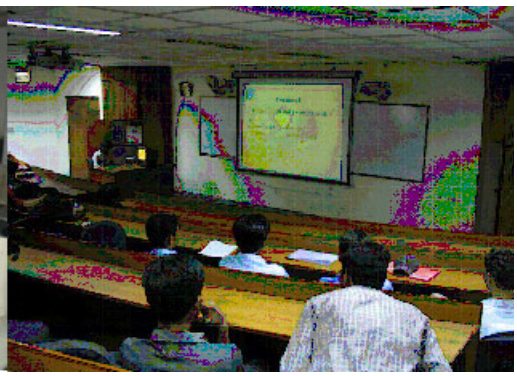
These campuses have regular classrooms where students actually sit and listen to the broadcasted lectures. While listening to the lectures they note down the problem they come across its delivery. After the lecture they go to the computer labs where they interact with the teaching faculty through Internet, the course contents, assignments and all the supporting material is available for them on the Internet at the university learning management system.

By this process students discuss their problems, issues and difficult concepts with the students of the same campus, they do their projects and preparation of exams in the same manner as the students of conventional education system. Moreover, due to the Internet they also communicate with their classmates all over Pakistan.

Thus the first component of the Hybrid model prepares the students to enter into the professional life in the same way as students from any conventional education system. They will be confident and fully prepared to interact with their co-workers and seniors, and excel in a competitive and professional environment.

At the moment there are **118** campuses located in 62 cities of the country, where around 5000 students are receiving education. Following is the image of one of our physical campus

Lab Sessions



Lecture Sessions

2.2 Lecture delivered through television

Pakistan has acute shortage of qualified and experienced teaching personals. This is true not only for the field of information technology but also for the social science disciplines. The good faculty that we do have is concentrated in few major cities of the country. The small cities and rural area is devoid of the excellence in education. This creates a great divide in the quality of education with in the country. Thus to spread education of high quality to all corners of the country and to minimize this difference in the standard of education the second component of Hybrid model is used, i.e. *Lectures delivered through TV*. Students of virtual university from all parts of the country listen to the lectures delivered by the same professor and thus get the same quality of knowledge. This is of key importance in building the educated nation.

Virtual University has its own television station and post production studios now, and broadcast the lectures over its two channels. The consultant professors design the course for the university and record their lectures for the television telecast. These lectures are also available on the CDs and VHS for the students and Private Virtual Campuses (PVCs). Following is a glimpse of the working at our television network:

Control Room

Recording Studio

2.3 Tutoring through internet

Since Virtual University is an e-learning university therefore the utilization of the Internet and its services is inevitable. Students use both Web and the emails to communicate with the teaching faculty and administration of the university. They access the contents of the courses and the supporting material over the Internet by logging into Virtual University's learning management system software that is located on the server of Virtual University. And direct their day-to-day administrative issues through the email system.

Tutoring through Internet is the third and very important component in our Hybrid model for education. The platforms used to impart knowledge over Internet are *Learning Management System and Email.* I will discuss both these platforms but the learning management system will be discussed in greater detail.

2.3.1 Learning Management System

Learning Management Systems (LMS) paradigm as defined by Paris Avgeriou are "specialized Learning Technology Systems (IEEE LTSC, 2001a), based on the state-of-the-art Internet and WWW technologies in order to provide education and training following the open and distance learning". Most learning management systems have three types of user. First type is the student, second type is the teachers/tutor and the third type of user is the administrator. Over the years it has been seen that for the best delivery of the courseware every learning management system should have the following features;

- The ability to include text, documents, files of many types including Office, audio, video, and images
- A grade book
- The ability to insert links of various resources, both internet and intranet
- A section for the FAQs

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- Discussion board

The VU-LMS has all the above features embedded in it. Every student has his/her account on LMS and can access its contents by entering the unique login ID and password. After logging into the system the student can see all the courses for which he/she has been enrolled as shown in the Fig-2 below.

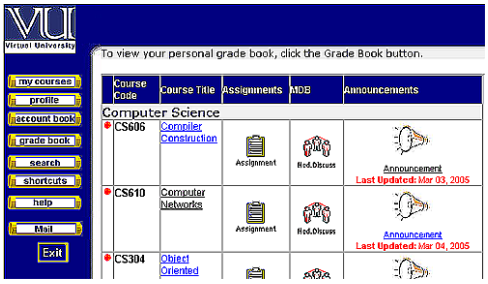

Figure 2: Courses for the semester of students at VU-LMS

The student clicks on the course he/she wants to study and the new page is displayed. On this page the students can access the contents of the lectures, the assignments discussion boards and the most interesting feature the MODERATED discussion board. See Fig-3 below.

On the lecture content area the hyperlinks to the lecture notes, in the form of word document and HTML are placed. On each content area there is a hyperlink to the set of multiple-choice questions, labeled as pre assessment MCQs. After that there are hyperlinks to the contents or supporting documents for that lecture, these contents may be in the form of word document, HTML PowerPoint slides etc. After the hyperlinks to the contents there is another link to the MCQs termed as post assessment questions. The pre and post assessment questions are placed on the content area so that the students are able to assess their knowledge before and after the commencement of the lecture as shown in the Fig-3 below.

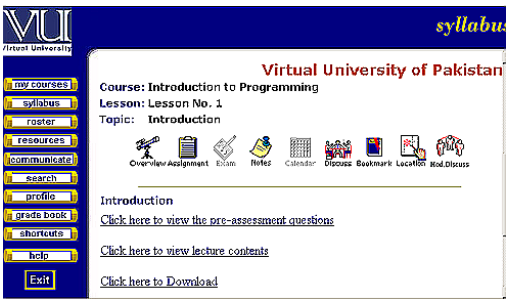

Figure 3: Contents area on VU-LMS

Another important feature in imparting education from the academic point of view is the process of assignments. I believe that assignments are very important mode of imparting education to the students as it force them to utilize their knowledge in solving various problems, and in return their efforts are assessed and graded. The VU-LMS has the facility to allow students to view the assignment statements given to them, see the marked assignments. i.e. the assignments are graded and commented by the teacher and are uploaded so that students may learn from their mistakes. They can also view the marks they score in each assignment as shown in the Fig-4 below, and see the general comments made about solution provided by the students. After the assignment's due date, the teaching faculty, upload its solution on VU-LMS, so that students may learn the best possible way of solving the given problem.

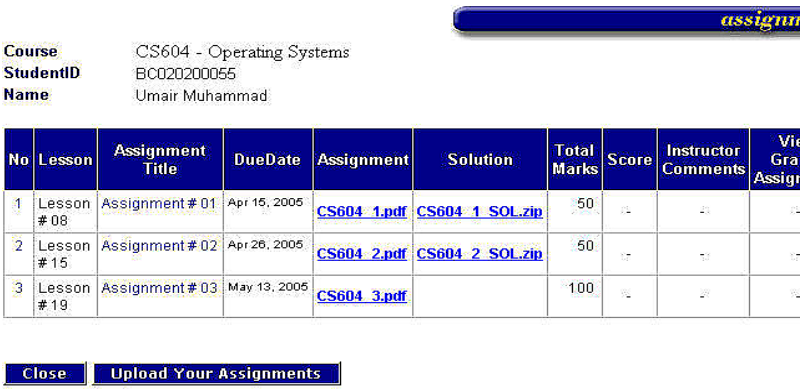

Figure 4: LMS assignment page

Discussion Boards are another very important feature of the learning environment, be it the distance learning or the conventional mode of education. There are three types of discussion board available to the students on VU-LMS. In

the first type students interact freely with each other and discuss their problems without any intervention from the teaching staff. This gives them the freedom of thought.

The second type of discussion board is termed as moderated discussion board (MDB). On this discussion board students put there questions or concerns regarding the current lecture. And the teaching faculty responds to each question. The idea is to simulate the mode of classroom's question answer session. Every lecture that is delivered through the television network has a corresponding MDB on VU-LMS. On this MDB student ask a question, this question is seen by all the students of the same class, irrespective of the geographical boundaries, and when a teacher responds and explains the concepts to the posted question, every one can see and get benefit instantly, thus it is equivalent to a conventional class room where students ask a question, every one hear it and when the teacher answers that question all the students who had the same problem but were shy to ask are benefited as well. An example of the MDB on VU-LMS is shown in the Fig-5 below.

Please note that for 3 credit hour courses there are 45 (1 hour duration each) lectures delivered on Television and thus there are at least 45 such discussion boards opened each semester.

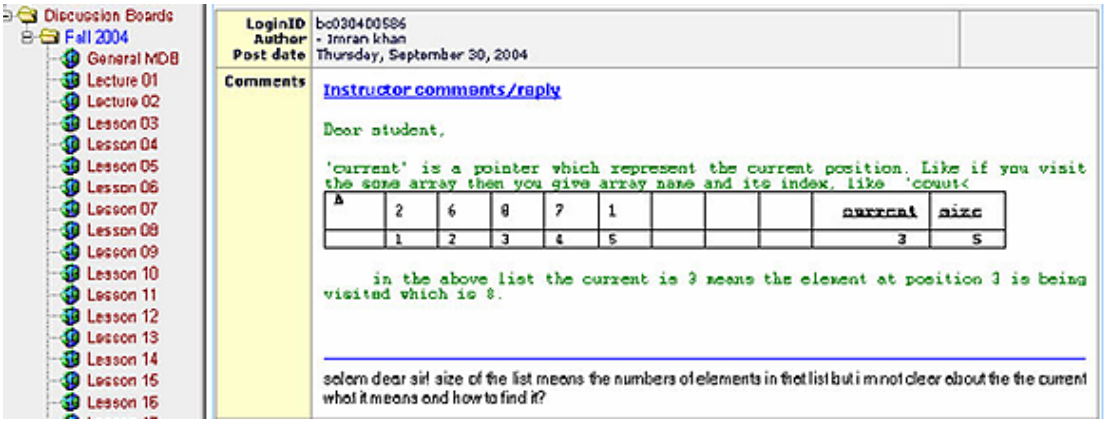

Figure 5: Moderated Discussion Board on VU-LMS

The third type of discussion board is termed as Graded Moderated Discussion Board or GMDB. This is the extension of MDB. This is the equivalence of the class *participation*. Students are given a topic of discussion a week in advance and then are asked to come onto this GMDB for discussion. Each student participates in the discussion and the teaching staff grades his comments and material of discussion. The marks awarded are equivalent to giving the marks to the students for class participation. In this way students are encouraged to speak up and put their point of view in front of the whole class, which adds value to the education of the students. Example of the GMDB is shown below in Fig-6.

These MDBs and GMDBs are great resource or knowledge banks, based on these MDBs FAQs are developed and updated. This activity is generally performed after each semester. Further more there are hyperlinks to important sites and books available on the VU-LMS.

Figure 6: Graded Moderated Discussion Board (GMDB)

2.3.2 Email

VU-LMS is not the only mode through which students interact with the Virtual University of Pakistan; every student has his/her email accounts on VU servers. Just as the student of other universities, students of Virtual University have various academic and administrative issues, for example, the problem of late fee

submission, or change of physical campus/PVCs, and late assignment submission etc. In order to cater these issues of the student virtual university has made email accounts for all relevant departments, for example, admission, exams, course selection, registrar, accounts, and for the course instructors of each subject. The most commonly used email accounts are those for the teachers of all the courses, academics, registrar, accounts and exams. However every student frequently e-mails their issues and sometime comments directly to the senior management, including the rector.

Thus the Hybrid Model of education practiced at Virtual University provide high quality education to students located all over the country, be it urban or rural areas, and provide them the necessary socializing aspect of the education.

3. Roles and responsibilities of the teaching staff

According to the teaching paradigm followed at the Virtual University of Pakistan, the best professor around the country are hired on contract to design the course content and record the lectures in the Virtual University television centre. Once these professors have developed the course material such as handouts, assignments and the midterm/final term exams and have recorded their lectures they are no longer associated with the University. In order to take this teaching process on and to deliver quality education to the students there are e-tutors or tutors present. As stated by [sheena bamks 2004] “In the Web based training, distance education and in most other forms of e-learning the teacher/tutor is very important, sometimes more important than in the traditional Education.”. This is very true; as for the students of distance e-learning institutes there is a marked divergence from the traditional face-to-face educational methods. The student no longer has the luxury to step into the professor’s room and get his/her points cleared, or the teacher of this educational mode cannot determine, during the recording of the lectures, if all the students will actually comprehend the point in question. Thus the responsibility of narrowing down this difference rests on the astute responses and knowledge of the tutors. It is the responsibility of the tutor to judge and analyze the problem that his/her student is asking, and present the most appropriate answer for it.

According to [Brigetti Denis 2004] the central role as linked to interaction between the e-tutors and the learner is Content Facilitator, Metacognition facilitator, Process facilitator, Advisor/Counselor, Assessor, technologist, resource provider. Furthermore the peripheral roles of e-tutor are listed as manager/administrator, designer, co-learner and researcher. The tutors at virtual university are fulfilling all the above mentioned responsibilities.. The specific tasks and responsibilities of these tutors/e-tutors include.

- To respond to each email that is received from the students: The queries that are generally asked by the student are about their low grades in the assignment, quiz, GMDB or exam and the pleas to allow the submission of late assignments,. On average each tutor has to answer about 50 to 70 emails every week.
- To answer every question placed on the MDB: There are minimum 45 MDB forums, each corresponding to the lecture telecast on the TV. On every MDB there are on average 40 to 60 questions, the number of questions posted on MDB depends upon the number of students enrolled in the course. Apart from these 45 MDB forums there are at least two general MDBs, one before the mid term exam and the other before the final exam. These general MDBs are opened on VU-LMS to allow students to ask the question related to all the lectures they have studied so far and not just for one lecture.
- To grade each comment or discussion point posted on the Graded Moderated Discussion Board GMDB. The number of posting on the GMDB is also dependent on the number of students enrolled in the given course.
- To write and upload the assignments for their course on the LMS. There are on average 8 assignments per course. How ever in certain courses the number of assignments is more than 10.
- To mark all the assignments uploaded by the students: Every tutor has to identify the mistakes of the students in

the assignment and provide the comments for the better understanding of the student, and then send the assignment back to the student(on students VU-LMS account). On average about 300 assignments are marked by each tutor every week.

- To provide the solutions of the given assignments: Tutors also solve the given assignment them selves and upload it on VU-LMS so that students can learn from it.
- To prepare the quiz, upload it over VU-LMS, mark the quiz and display the result: The number of quiz marked depends upon the number of students in the given course.
- To provide the solutions of the given quiz: Tutors solve the given quiz then upload it on VU-LMS.
- To prepare the midterm and final examination question papers: On average tutors have to set three to four examination question papers per exam.
- To mark the answers of the midterm and final examination given by the students. The number of papers marked depends upon the number of students in a course, however on average, each tutor marks about 300 to 400 examination papers. The tutors also prepare the solutions of the examination questions.
- To upload and update the course contents on the LMS: Tutors regularly update the contents (lecture notes, FAQs etc.) of their course on the learning management system (VU-LMS).
- To update the handouts: For the better understanding of the course virtual university provide the handouts to the student. These handouts are printed on paper and delivered to students

Furthermore tutors are constantly devising ways to make their course more interesting for the students. For this purpose students are given challenging home works and course works. These course works are not graded but they develop interest of the student in the given subject.

The structure of the teaching staff is such that for every course offered, there is a team of tutors working diligently to conduct the course in a most effective and professional manner. For each team there is a senior tutor or team lead. The responsibility of the lead is to manage and guide his team members in responding to student's questions and queries and think of the ways to improve the standard and quality of course contents.

It is to be noted that the number of tutors in a course is directly proportional to the number of students enrolled in that particular course. The prescribed ratio is one tutor per 300 students. Hence if the number of students enrolled are less than 300 than one tutor takes care of the course.

At the moment Virtual University is offering BS in 12 disciplines. For each discipline there will be a senior faculty member termed as assistant professor. The main responsibility of this senior faculty will be to manage all the courses under his/her domain. i.e. for BS computer science, this senior faculty will manage all courses related to the field of computer science.

4. The basic problems faced by the tutors and the students of VU

The hybrid mode of education is new and unique in this region. Thus there are neither any set rules nor processes yet defined, implemented and tested, that may directly be incorporated into Virtual University. Hence the team of VU is learning as it moves on. There are great achievements to its credit but the path to success is not without difficulties. There are several problems that the, students as well as the teaching faculty faces. The nature of problem ranges from administrative to academic to broadcasting. However here i will highlight the academic issues and problems faced by both students and teachers

The students have reported following problems through emails, telephone calls and by visiting the Virtual University Head Quarter:

- It is difficult to adjust to the class room without the actual presence of the teacher
- The mode of education and communication at VU-LMS is through English language (lectures broadcast are, however bilingual); this language is not the first language of the Pakistani citizen. Hence at the

beginning they find it difficult to ask questions and queries through internet using English language.

- Since there are no one physically present to solve problems related to the course lectures, especially in the field of mathematics as the concepts of mathematics are quite complicated and difficult to explain via recorded lectures and internet, it is hard to understand the contents.

The problems faced by the teaching faculty are as under:

- Tutors are new to this mode of education delivery and thus they initially find difficult to adjust and respond to queries. Mostly it has been observed that tutors think they can explain a concept in a better fashion had the student been physically present there
- In the case of Assignments, some students tend to copy another students work, however it is not possible at the moment to determine who solved the questions first, and awards no marks for it. Thus tutor feels that due to the distance they are some time not able to educate students to the fullest.
- Since the mode of instruction is in English, Students are generally not able to put their questions properly, thus it is difficult to respond to the students.
- It is difficult to explain complicated mathematical concepts through MDBs and email.
- Students generally provide excuses for not submitting assignments on time. The teacher has no way to verify his claims.

The team of virtual university under the guidance of the rector Dr. Naveed A. Malik is constantly evolving new ways to breach this gap between students and teachers.

The idea of teaching assistant has been introduced at VU to cater the above-mentioned issue. Initially 39 teaching assistants are appointed in various physical campuses all over the country so that they can coach their juniors.

Further more it is under consideration to utilize the television broadcast, and take important questions from students (email, phone call etc..) and provide answers to them on live telecast session called tutorial sessions.

5. Summary

In order to educate the Pakistani nation in the minimum time, government of Pakistan adopted the Hybrid model of knowledge transfer. Hybrid model of education involves the broadcasting medium such as television, the Internet and the physical campuses where the students are actually seated to receive education. The professors that are rated as the best ones in their field deliver the lecture through television broadcast. The teaching faculties that actually interact with the students are available over the Internet, and respond to student's issues and problems through the email and the learning management system placed on VU server. The learning management system has the course contents, FAQ, resources and links available. The best mode of communication on learning management system (VU-LMS) is the Moderated Discussion Board (MDB). The tutors or e-tutors play the pivotal role in imparting education to the nation. They are mentors, guide and problem solvers for their students. However since the concept of this mode of education is entirely new to this region there are certain issues and problems but the team is constantly seeking the solutions and removing the problems.

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