

# A Hybrid E-learning Model in a Localized Environment

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## Abstract

The rapid developments in Information and Communication Technology (ICT) have transformed open and distance learning into e-learning or online learning. The increasing pace of technology-based activities has created a competitive environment and challenges for the institutions providing distance learning programs. This paper presents a hybrid e-learning model keeping in view the international standards adopted in a localized environment at the Allama Iqbal Open University (AIOU), Islamabad, Pakistan. The model is composed of delivery of course tutorials, student teacher interaction and assessment criteria. The model is implemented on a selected course of computer sciences offered at AIOU with sizeable proportion of females and outreach to rural areas of the country. The examination results show that the hybrid e-learning mode has improved the performance of the students as compared to other courses of the same level. The paper also discusses the results of a feedback survey conducted from the enrolled students. The survey results reveal satisfaction and strong preferences of e-learning by the local learners.

**Keywords:** Distance Education, E-learning, Hybrid Model, LMS

## 1. Introduction

Distance education is a non-formal mode of education in which teachers and students are not physically present in an educational environment such as a classroom (Dib, 1988). It is not dependent on face-to-face interaction between teachers and students; therefore, it offers opportunities of teaching and learning when traditional education is difficult to implement (Michael & Alan 2002). However, in order to manage a distant learning system, a communication means is essential to mechanize the educational system (Simonson, Smaldino, Albright, & Zvacek, 2014). In earlier distance education mode, the postal mail-delivery service played a significant role of communication medium among instructor and student. But in today's modern era, the means of communication have changed with the evolution of Information and Communication Technology (ICT) (Moore, Dean, & Galyen, 2011).

The use of ICTs has changed distance education into e-learning which refers to electronic mode of education through the use of media and communication technologies (Sife, Lwoga, & Sanga, 2007). In recent years, e-learning has become more popular and its use in educational institutions is increasing exponentially. There are different approaches of e-learning like Computer Based Training (CBT), Online Learning and Technology Enabled Learning (TEL) (Adnan, 2015). TEL refers to the technological support for learning activity. It overcomes the difficulties of geographical distance among students and teachers and provides robust technology-based learning environment. The combination of distance and e-learning has led towards the hybrid mode of learning.

Hybrid is a blended mode of education which is based on various combinations of face to face lectures, online delivery of instructions and other academic services via technology (Tsai, 2011). The information technology plays a vital role in a hybrid learning model, which not only facilitates class room teaching but also supports distance learning by providing online communication and delivery mechanism. However, the development of hybrid

e-learning model is a real challenge in a localized distant learning environment. There are several issues and challenges such as provision of specialized electronic material, online course delivery and infrastructure to manage blended learning activities in a localized environment.

Allama Iqbal Open University (AIOU) is a distant learning institute in Pakistan which was established in 1974 as the first Open University in Asia. This University is renowned due to its flexible system of open and distance education. The University has its main campus in the capital city of Pakistan, Islamabad, and has a huge network of regional offices in different cities of the country. The university is working to harness the modern Information Technology for spreading distance education (AIOU official website).

The objective for this paper is to present a model of hybrid e-learning in a localized environment. The rest of the paper is organized as follows: section 2 presents the related work, section 3 discusses technology enabled learning initiatives at AIOU, section 4 presents the proposed hybrid model and highlights its important components, section 5 highlights implementation and results of hybrid e-learning model, section 6 discusses the analysis of a survey conducted from the enrolled students and finally section 7 presents the conclusion and future work.

## **2. Related Work**

During last few years, ICT has made remarkable impact on modes of teaching and learning. This has taken the world of open and distance learning towards hybrid mode of education. Graham (2006) defines Blended E-Learning System as a collaboration of instructions from two historically separate learning environments: classroom teaching and full e-learning. It emphasizes on the primary role of ICT with classroom teaching and providing accessibility to outreach areas. Hoic-Bozic, Mornar, & Boticki (2009) describe that blended learning not only contributes towards student's satisfaction but also improves their academic results.

Liyanagunawardena, Adams, Rassool and Williams (2014) present a case-study of implementing blended learning in Sri Lanka. The study concludes that ICT infrastructure, computer literacy, local language contents and student support services are important issues that need to be considered while designing hybrid courses in open and distance learning environment. Another study conducted by Tarus, Gichoya, & Muumbo (2015) present the key issues of implementing the e-learning in Kenya. The study highlights some notable challenges that may be focused to develop a successful hybrid model of e-learning. These issues are lacks of financial resources, e-learning infrastructure, Internet bandwidth, ICT competency and lack of motivation of teachers and staff members. The study further concludes that despite these issues there are opportunities that may be availed by upgrading existing facilities and infrastructure. Rosseni et al. (2011) conducted a study to determine success factors of hybrid e-learning at a public university in Malaysia. They illustrate that technology can effectively be used to engage students for their learning. They further elaborated that the important contributing factors in e-learning are content, delivery, services, structure and outcome.

Although hybrid model can effectively be used to supplement the academic activities in an ODL environment but it differs from technology to pedagogy in a localized environment. Various challenges need to be considered such as development of localized content matching with learning styles of local learners and its delivery over local infrastructure. The other important issues are Internet bandwidth, electricity load-shedding and availability of infrastructure for face-to-face interaction at appropriate locations. These challenges motivated us to present a model of hybrid e-learning for AIOU in a localized environment.

## **3. Technology Enabled Learning at AIOU**

The concept of Technology Enabled Learning was introduced at AIOU (Sangi, 1999), where the thought of virtual education was presented. The concept was gradually transformed into a model of Open Learning Institute of Virtual Education (OLIVE). The goal was to provide a model which is flexible, inexpensive and provide increased outreach with ICT enabled approach. Present e-learning progress at AIOU can be divided into four phases; early experimental stage, enhancement & localization, application and testing stage. The details are available in OLIVE E-learning framework study (Sangi & Ahmed, 2015). The important developments include the multimedia instruction objects (Daud, 2009), accessibility model (Sangi, 2009), generalized assessment model (Sangi, 2008) and a model of adaptable e-learning (Moiz, 2015).

Moiz (2015) conducted a feedback study from e-learning students at AIOU. The study highlights that students have strong preferences of e-learning and they want more courses in online (hybrid) mode of education.

However; the existing programs are lacking in electronic contents to best gratify the needs of local learners. Furthermore a sizeable component of face-to-face interaction needs to be blended with online activities in order to fulfill the gap during online interaction. These challenges compel the open and distance learning institutions to adopt hybrid e-learning model.

#### 4. Proposed Model of Hybrid E-learning

The proposed online model comprises of following components:

- a) Course tutorials development and delivery
- b) Student-Teacher Interaction
  - i). Online forums/Chat
  - ii). Face-to-face course workshop
- c) Assessment

#### 4.1 Course Tutorial Development and Delivery

The course tutorials are composed of Open Education Resources, videos & audios, text based tutorials and slides (figure 1). These tutorials are developed and customized as learning objects in different formats to match with visual, auditory and kinesthetic learning styles (Gholami & Bagheri, 2013).

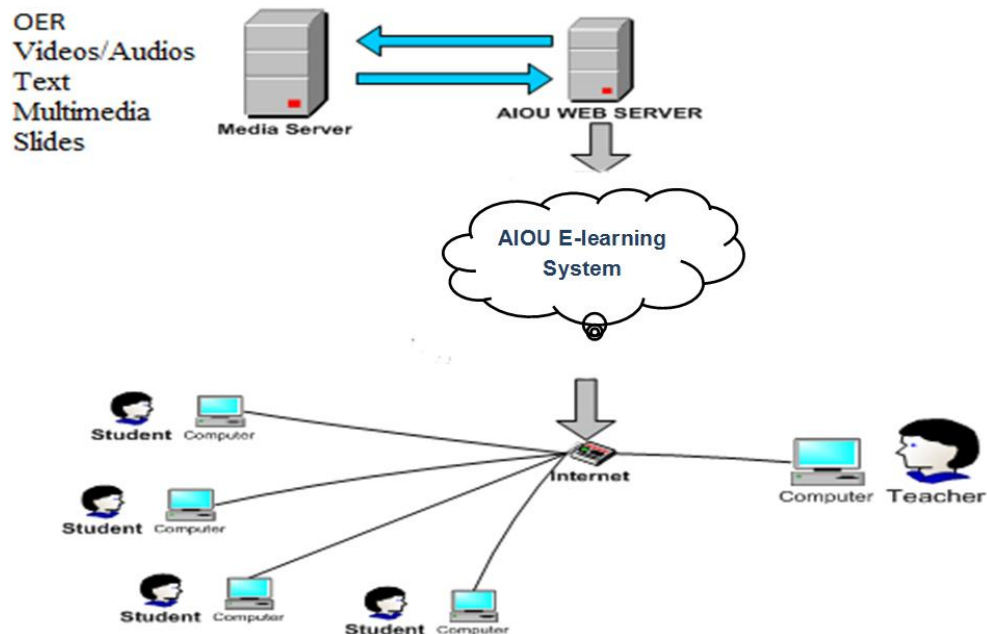


Figure-1: Distant delivery of course instructions

The contents are placed on an open source Learning Management System (LMS) MOODLE for delivery to distant learners. Besides the course tutorials the course calendar (guidelines, time table and schedules) is made available on the University website. Additional announcements are also published periodically at the LMS website. Students and teachers are required to regularly check and follow these announcements and updates. Teachers can also float announcements at the LMS website. However students can only browse these instructions and may get further information from the tutor concerned.

#### 4.2. Student-Teacher Interaction

There are two mechanisms of student teacher interaction: online and face-to-face. Students can interact with teacher via using synchronous and asynchronous tools of MOODLE (figure 2). There are 15-18 online synchronous sessions which are scheduled on weekly basis. Additionally, forum discussion is also provided as an asynchronous mode of interaction between student and teacher. Forums provide a platform for discussion about the current topic where students and teachers can share their views and float relevant questions and share latest developments.

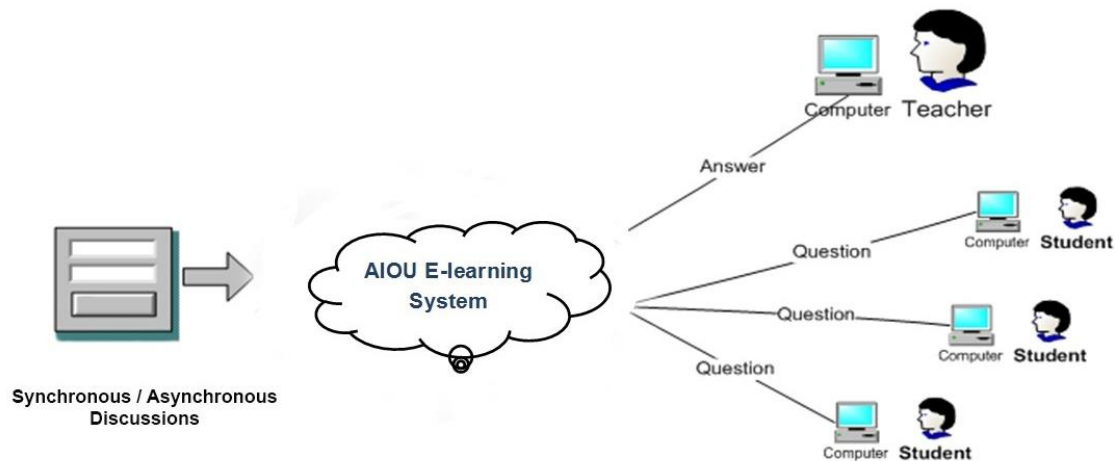


Figure-2: Student-Teacher Interaction

The teacher is available for 1-2 hours duration per week (Chat + Forums) for each course. Thus, 15-18 hours student-teacher interaction is maintained for a course during a semester. The web server log record is used for the purpose of teacher's payment. The hands-on practices for practical courses are conducted either on student's own PC or at the computer labs of Approved Study Centers/Regional Campuses according to pre-defined time table.

There are two face-to-face workshops in each semester. The first workshop is arranged at the beginning of the semester. It is an orientation workshop where students are introduced about the activities to be performed with hands on training on LMS. The second workshop is the course workshop where students are provided 8-10 hours of teaching for each course. The practical session for practical courses is conducted either on student's own PC or at the computer labs at the campus during the workshop. These workshops help to provide student-teacher interaction in each course. Attendance is mandatory for students in each course workshop. The workshop is conducted at approved campus of the University. In future it will also be arranged at the University's Regional Centers through video conferencing.

#### 4.3. Assessment

The assessment is composed of two assignments (10 %), Mid Term examination (20 %) and final examination (70 %) as per the University criteria. Assignments are uploaded by teachers on LMS website with schedules of submissions. Students download the assignments and prepare solutions following the deadlines and uploads solved assignment (in Microsoft Word format) before due date. Instructor marks the assignments and announces the result on the website. Midterm has a weightage of 20% for each course. The course Instructor conducts the midterm as per schedule during program workshop. Final examination has a weightage of 70% for the whole course. The University's Examination Department conducts the final examination by sending Roll No slips to students as per schedule. The examinations are conducted at all major cities of the country and students are also facilitated to download the Roll No. slips from the University website.

#### 5. Implementation and Results

A course of Software Engineering of Post Graduate Diploma (PGD) in Computer Science was selected to be offered in Hybrid mode of learning. The course is a combination of theoretical and practical aspects and was selected after consultation with the faculty members of the department. The contents of course comprise of nine chapters and each chapter is composed of topics as per standard format of the University. Fifty seven students were enrolled from different parts of the country. The result comparison of hybrid course was made with the other courses of same semester. The result comparison is shown in figure 3:

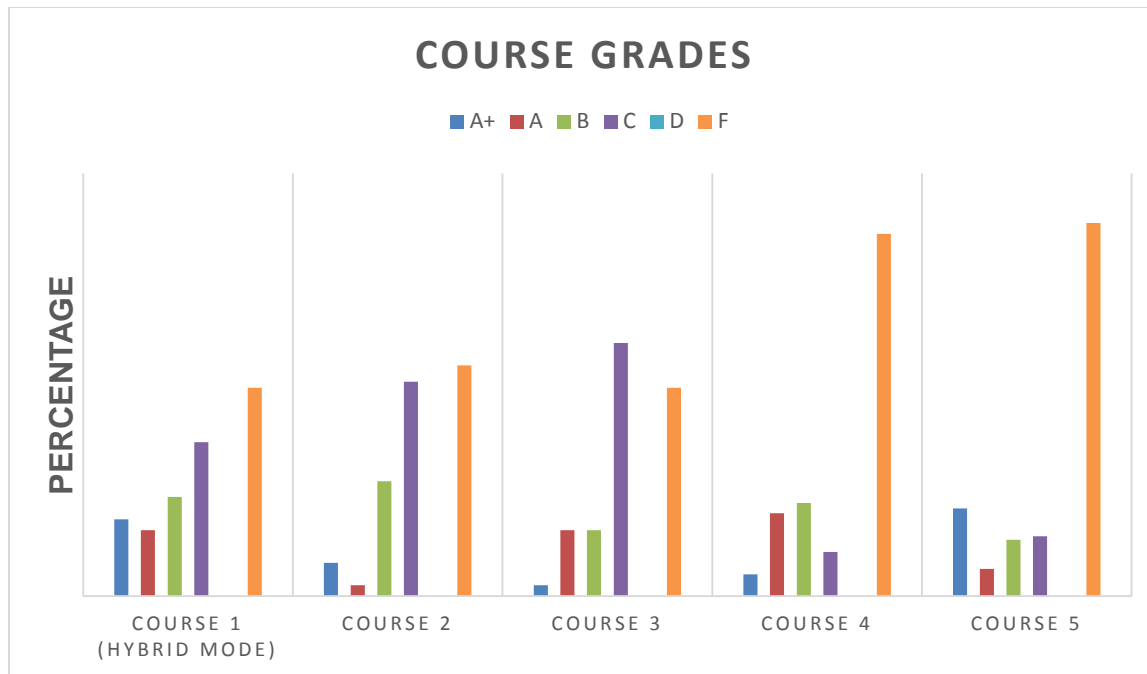


Figure-3: Result comparison

The percentage of A+ and A grade holders of course 1 offered through hybrid e-learning mode was tremendous as compared to other courses. Moreover, the absent and failure rate also dropped. The results showed the significant improvement in overall class progress.

## 6. Feedback Survey of Students

The evaluation of proposed model was conducted; it was aimed to investigate the perception of students about hybrid mode of e-learning keeping in view technology and pedagogy. A questionnaire was developed which was validated by e-learning experts. The questionnaire was organized in two parts. Part-I contains demographic questions, whereas, part-II comprising of questions about the evaluation of hybrid e-learning. The evaluation questions in part-II are designed on a Likert Scale of 1-5 (1: Worst 2: Poor 3: Good 4: Very Good 5: Excellent). These responses were analyzed using SPSS statistical package and MS Excel, whose results are presented below:

### 5.1 Demographics

The demographic results (figure 4) show that majority of the respondents (52.6%) are living in urban areas, whereas 24.6 % in semi-urban, and 22.8 % in rural areas. A sizeable proportion of students belong to rural and semi-urban areas highlighting the success of hybrid mode of e-learning. The gender status is also encouraging with 35.1% female and 64.9 % of males. About 80 % of the students are professionals having jobs in various fields and these students were best satisfied with the flexibility level of hybrid model of e-learning. The majority of respondents were from age group of 21- 30 years, but interestingly students from different age groups including senior citizens are also found among AIOU students, as per ODL policy of the university.

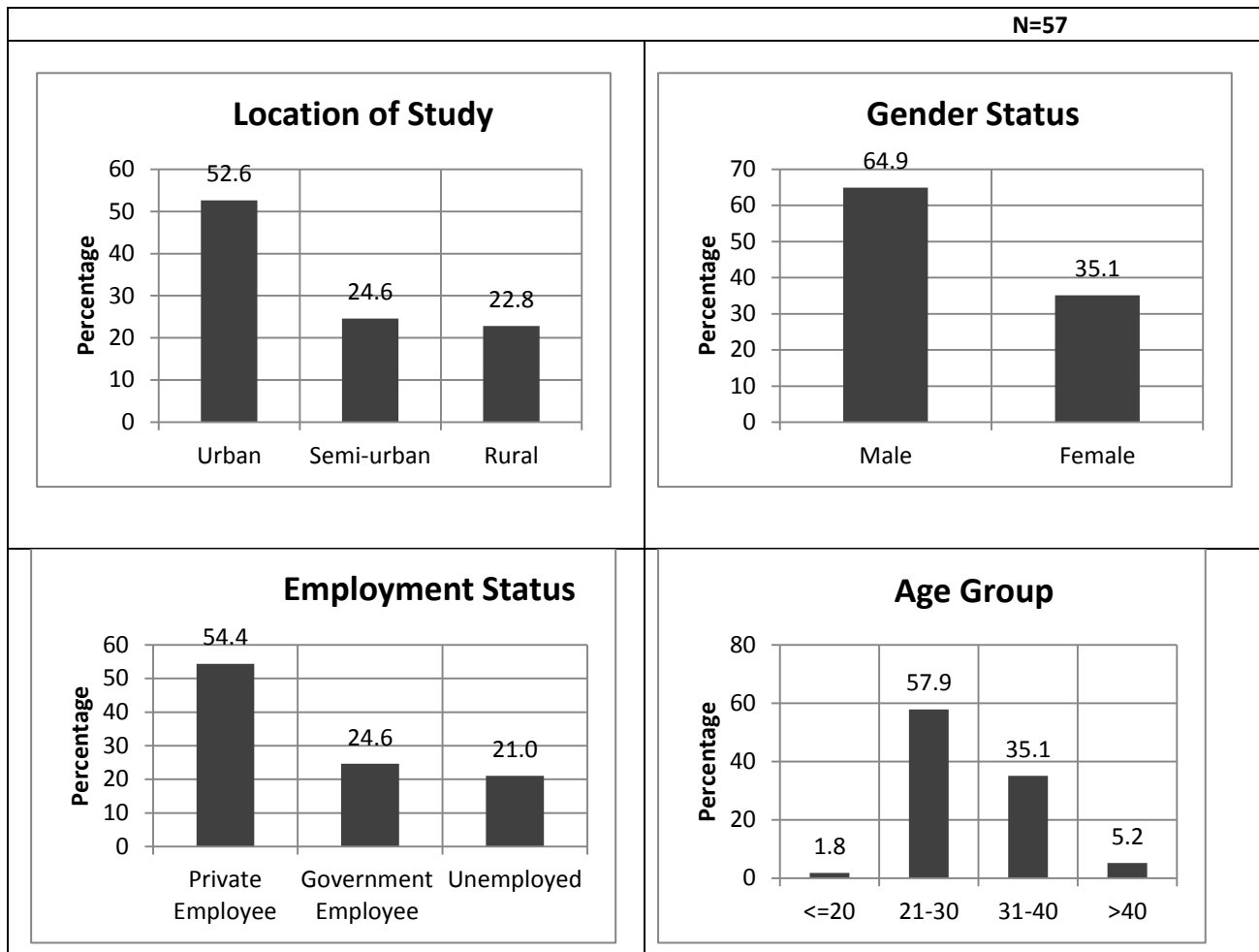


Figure-4: Demographics

## 5.2 Feedback about Pedagogy and Technology

The analysis of the responses about technology and pedagogy of hybrid e-learning mode is given in table 1:

N=57

Questions	Mean	SD
Did hybrid e-learning model help in your learning?	3.4	1.0
Did you feel satisfy to use locally prepared e-contents?	3.3	1.1
Was the user interface of website friendly?	3.8	1.0
How do you rate assessment module?	4.0	0.7
Interaction with teacher was convenient?	3.5	1.3
How do you rate Internet services?	3.7	1.0
How do you rate program workshop?	4.1	1.1
Hybrid e-learning helped you get better grades?	3.5	0.9
You want more courses to be offered in hybrid e-learning?	3.7	0.9
The overall knowledge and skills you learned from the model.	3.8	1.0

Table 1: Feedback analysis about technology and pedagogy

Analysis of table 1 reveals a positive response about hybrid model of e-learning. They were satisfied while using locally prepared e-contents and highly appreciated the presentations provided to them. They rated the interface as friendly and easy to operate. They liked the quiz and assignment modules and valued that interaction was helpful for the preparation of examination. They found Internet services accessible with seamless communication. The technology was valued as useful for their learning and they also wanted more courses to be converted in hybrid e-learning.

## **6. Conclusion and Future Work**

A model of hybrid e-learning has been proposed in this paper. The model comprises of delivery of course tutorials over local ICT infrastructure, student teacher interaction and assessment. The content development model is based on VAK learning style to match with the desired format of local learners. The delivery tool of an open source LMS MOODLE has been customized as per program pedagogy. The student - teacher interaction is blended i.e. major chunk is online and about one-third is face-to-face according to course credit hours. The model has been tested on a computer science course. The examination results highlights that hybrid e-learning has contributed in improving the performance of enrolled students and the dropout rate has also decreased. The survey of enrolled students was conducted to evaluate the implementation of hybrid model. The results also show that students are enrolled from urban, semi-urban and rural areas of the country. The gender status reveals that a sizeable proportion of females are enrolled in program. The age group analysis highlights that candidates from different age groups not only enrolled but successfully completed the course.

The hybrid e-learning model at AIOU has been successful. The program is outreached as students are enrolled from urban, semi-urban and rural areas of the country. The students are comfortable with blended mode of education. They are satisfied with the localized content which is easily downloadable over available Internet bandwidth. The program design and selection of right technology has helped in success of hybrid e-learning at AIOU. In future, more programs of other discipline may be converted in hybrid mode of learning. The research provides a case study for implementation of hybrid e-learning in different localized environment.

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