A Blended E-Learning Topology in an ODL Environment: A Case Study of AIOU

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Abstract

The working ecology of the distance learning has been transformed in a revolutionary manner after the rapid advancement in the Information and Communication Technologies. The traditional distance education has now gained the shape of online learning or e-learning after the advent of these ICTS, bringing so many challenges and more competitive environment for distant learning institutions. This research study has been conducted to propose a blended e-learning topology in a localized environment of an open and distance learning institute. The case study of Allama Iqbal Open University (AIOU) has been taken. The model consists of development of small re-useable learning objects, delivery of course instructions to distant learners, communication between student and teacher, classroom-based teaching, course assignment, and final examination. The proposed model has been implemented in AIOU for a selected computer science course. The result of the students in the final examination show that the performance of the students enrolled in blended e-learning mode of content delivery has been improved when compared to students of same level enrolled in traditional mode of education. The male and female proportion of respondents was also appropriate. The students also showed strong preference for using blended e-learning model.

Keywords: *E-learning, Distance Education, Blended Model, Learning Management System, ICT in Education*

1. Introduction

Open and Distance Learning (ODL) system as according to Michael & Alan (2002) is a unique and different working ecology as compared to formal system of education. In an ODL institution, teachers and students are not bound to physically interact. Instead, they keep interaction through various ways like postal mail delivery, tutorials, workshops, assignments etc. (Beldarrain, 2006). ODL facilitates the learners in an atmosphere where formal system of education fails as it provides second chance of education to people at any stage of life (Dib, 1988). Due to the latest technological advancements, the dependence of distance learning on traditional ways like postal mail delivery has lowered and more emphasis is being given to modern ways of communication like internet-based modes (Moore, Dean, & Galyen (2011). Students especially in developing countries are now eager to switch to new modes of communication in an ODL environment like e-learning (Tarus, Gichoya and Muumbo, 2015).

With the help of new ICTs, the ODL now is mostly switching to e-learning, which is a means of education in which computer and internet are being used (Kintu & Zhu, 2016; Ali, 2015). Furthermore, mobile phones are also in use for e-learning which are facilitating students to learn in ease (Nikou, and Economides, 2018). The interaction between a teacher and students can be synchronous or asynchronous (Bolliger, and Martin, 2018). E-learning also requires development of digital contents which should be appropriate to the needs of students. E-learning delivers specialized digital contents and instructions through ICTs (Rienties & Toetenel, 2016). In this age of ICT, no ODL institution can survive without the usage of a blended model of learning in which e-learning is a must part. For this purpose, new e-learning models are also required as per needs of the localized environment (Choudhury and Pattnaik, 2020).

A blended e-learning topology is a new concept, in which different combinations of learning modes are made in a hybrid form e.g., a combination of delivery of course contents through online mode and face to face meetings (Alachiotis, Verykios and Stavropoulos, 2019). With the development of new ICTs, the e-learning is now a mandatory feature of open and distance learning systems. E-learning is also a part of blended models of learning (Tsai, 2011). In a blended model of learning, the role of the communication and information technology is very vital as along with supporting online communication, it also assists class room teaching making a hybrid model of education in an open and distance learning environment (Waheed, Kaur, & Kumar, 2016). It is important to point out here that in a localized distance learning environment like AIOU, there ae several challenges to a blended e-learning topology. Among them mechanism of online delivery of courses, provision of specialized material and necessary infrastructure are more important (Ryan et al., 2016).

This research paper is aimed at presenting a blended model of e-learning along with the traditional ways of open and distance learning in a localized environment (Ahmed and Hussain, 2016; Ahmed, Hussain & Farid, 2018). The paper takes Allama Iqbal Open University as a case study, being the pioneer and leading Open University in Pakistan. Its main campus is in Islamabad while a strong regional campuses network is established across the country. The rest of research article will be focusing on the relevant literature, proposed blended model of e-learning, implementation of blended model of e-learning and analysis of the survey results.

1.1 Research Objectives

Main objectives of the study were to:

1. Identify the practices of blended learning in an open distance learning environment using ICTs.
2. Present a model of blended learning keeping in view the influencing parameters.
3. Evaluate the acceptance level and effectiveness of the blended learning model.

1.2 Significance of Study

The use of information and communication technology is becoming unavoidable in this contemporary digital era especially for the educational organization with the philosophy of distance learning. This scenario is leading to specialized e-learning models for enhancing the learning opportunities for students and their knowledge level. This research study will be of great help for the development of blended programs for education in a distance learning environment. This blended e-learning model for open and distance learning environment will surely help to bring quality and standard in distance learning and will serve as a role model for institutions.

2. Review of Literature

The open and distance learning systems have been transformed after the revolutions in ICTs, which have introduced blended modes of teaching and learning (Santally, 2019). A blended model is basically a combination of instructions from two different learning environments (González-Gómez et al., 2016, Graham, 2006). The blended model of e-learning along with facilitating the teachers also contributes towards the improvement in academic achievements and satisfaction of students (Hoic-Bozic, Mornar, & Boticki, 2009, Northey et al., 2015). Tarus, Gichoya, & Muumbo (2015) studied the problems faced in implementation of e-learning in Kenya and also studied some important challenges while developing and ensuring success of a learning topology based on blended model of e-learning. Similarly, a study of the implementation of blended e-learning model in Sri Lanka was studied by Liyanagunawardena et al. (2014), which recommended that localized course content, literacy of computer, and infrastructure of ICTs is a must for launching blended courses in an ODL environment.

A study by Rosseni et al. (2011) was undertaken to explore the factors which are important for success of blended e-learning topology in a Malaysian public sector university. The study has laid great emphasis on technology that it can help to a large extent in the study and learning of students. Important elements of e-learning mentioned by them include delivery of content, structure, localized content, and services. However, the challenges to e-learning highlighted include lack of infrastructure, internet speed, lack of motivation of staff and teachers etc. In spite of these challenges, the study foresees many opportunities in blended model of e-learning. The learning outcomes of both the teaching methods i.e., blended mode and face to face learning mode have also been compared by many researchers.

A study conducted by Bernard et al (2014) showed that students admitted in blended mode of learning showed slightly better performance as compared to the students enrolled in traditional distance learning mode. Similar results were also shown by researches conducted by Ryan et al (2016) and Southard, Meddaug & Harris (2015). Shantakumari & Sajith (2015) also gauged the satisfaction level of students who were using Blended Topology of e-learning to determine the effectiveness of the mode. However, a study by Elmer, Carter, Armga, and Carter (2016) didn't find any significant difference between the traditional open learning system and blended mode of learning.

The above literature elaborates that a blended model of e-learning is a good addition to the traditional learning models in an ODL environment and it can benefit students at large. However, this model requires some special treatment and important elements to get success like localized content, necessary infrastructure including ICTs, internet bandwidth, etc. it is, therefore, this model blended e-learning topology is being presented with a case study of Allama Iqbal Open University, Pakistan.

2.1. Proposed Model of Blended E-Learning

The proposed blended e-learning topology is as follows:

a. Development of small re-useable learning objects
b. Delivery of Course instructions to distant learners
c. Communication between student and teacher
d. Class Room based teaching
e. Course Assignment
f. Final Examination

a. Development of small re-useable learning objects

Learning objects are entity based self-contained individual topics, which are composed of electronic multimedia instructions. The small learning objects are being developed for distant learning courses which can be re-used by many other users enrolled in similar courses at any time (Daud, 2009).

b. Delivery of Course instructions to distant learners

The delivery of course instructions and learning objects are carried out through learning management system (LMS). These materials are placed on open source customized AAGHI LMS based on MOODLE (aaghi.aiou.edu.pk). Besides the tutorials, the course outline, semester schedule, study guides, and assignment questions are also accessed through the learning management system as shown in figure 1.

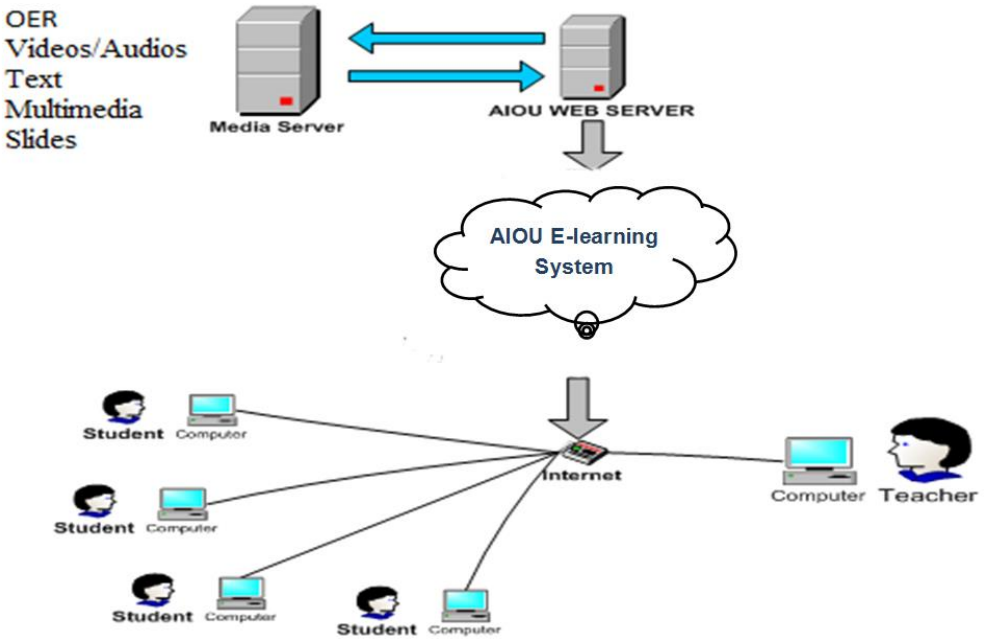


Figure-1: Delivery of electronic courseware to distant learners

c. Communication between student and teacher

The online communication between students and teacher is managed by available tools on the LMS. Two types of communication are managed i.e., synchronous and asynchronous (figure 2). The synchronous communication is usually carried out by a big blue button application, which is integrated with the LMS. This communication is real time communication between teacher and students. On the other hand, asynchronous is off-line communication between teacher and students which is managed by moderated discussion forums (Moderated Discussion Board -MDB). The forums are good source of addressing questions of students and sharing of knowledge on current course topics.

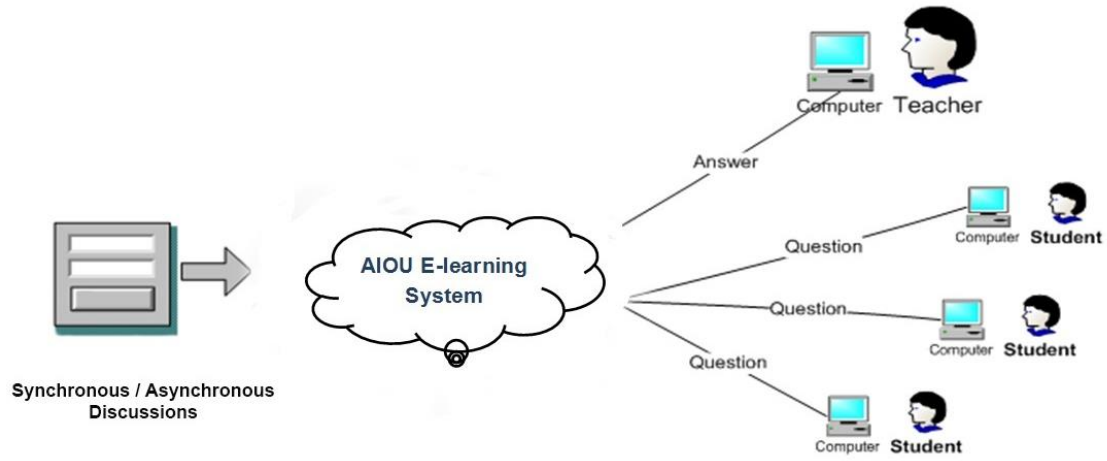


Figure-2: Communication between Student and Teacher

d. Class Room based teaching

The small segment of class room-based learning is also an important component in open and distance learning environment. As per international standard of blended e-learning, the class room-based teaching should be minimum one third of total credit hours. Therefore, program workshop is arranged for each course, in which students have the facility of face-to-ace interaction with the teachers.

e. Course Assignment

In traditional ODL environment, course assignments are managed through postal correspondence between student and teacher. However, in the proposed model, assignment component is managed through LMS activity, where students download the questions and upload the solution as per schedule given by the course teacher. The grading of assignments by the teacher is also conducted on the LMS.

f. Final Examination

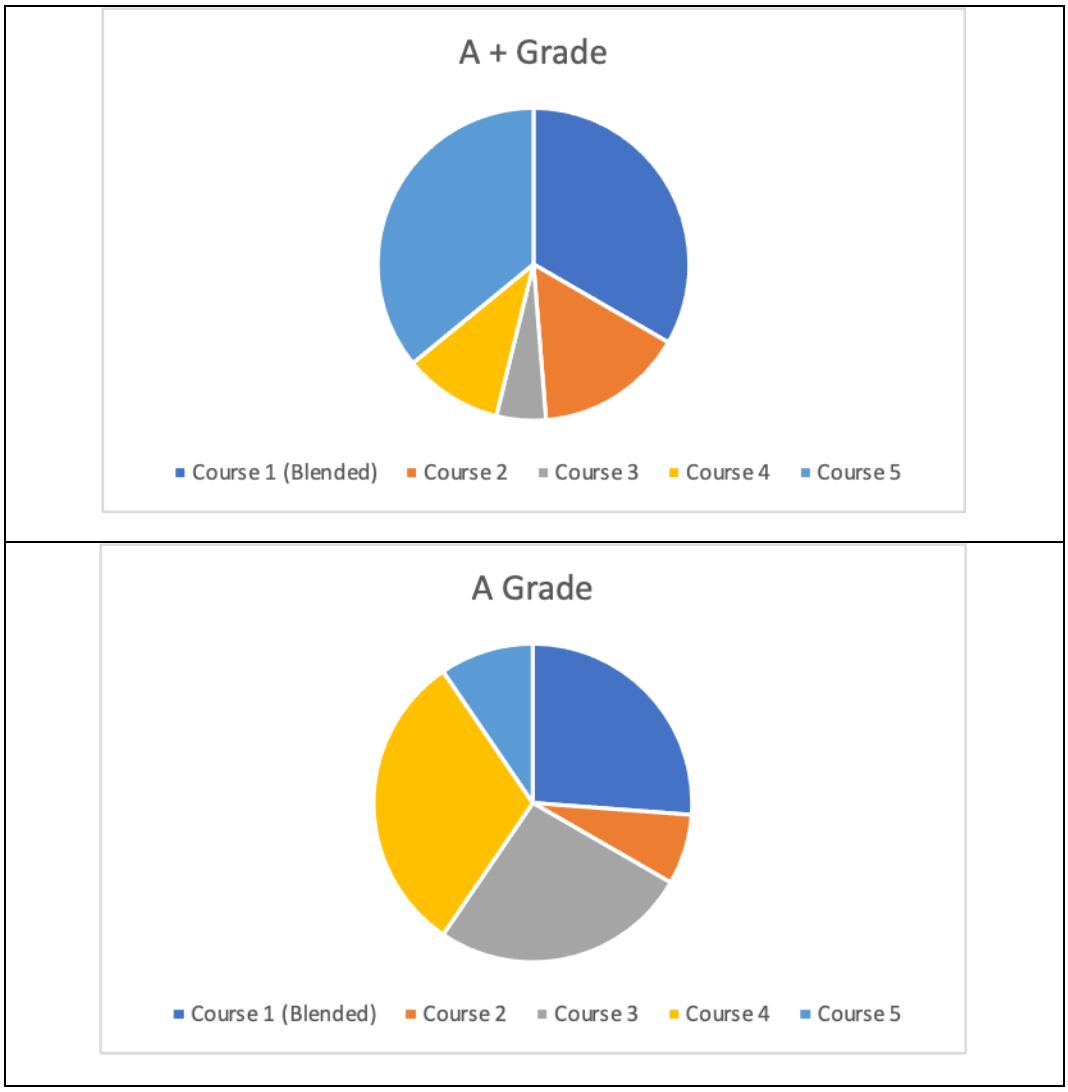
Final examination for every course at the end of the semester is being conducted by Examination Department at the designated examination centers.

3. Methodology and Results

A Computer Science Diploma course of AIOU has been taken as a case study to implement the blended e-learning model. The course was offered to students in blended e-learning mode and the other four courses were offered in traditional mode. The blended learning course was comprising of theory as well as practical and was selected after thorough deliberations. There are a total of nine chapters or units, each having different topics on standard format. A total of 70 were enrolled in the program from across the country. A comparison was made between the results of course on blended model and courses on traditional model in the same semester as shown in figure 3.

As shown in the figure, the results of course offered in blended mode were better as compared to courses offered in traditional mode. The A+ and A grades obtained in blended course

were good in percentage. Furthermore, the rate of attendance was also much better in blended mode along with the decrease in the drop out students and failure percentage. So, there was a significant improvement in the learning outcomes in blended mode as compared to traditional mode.



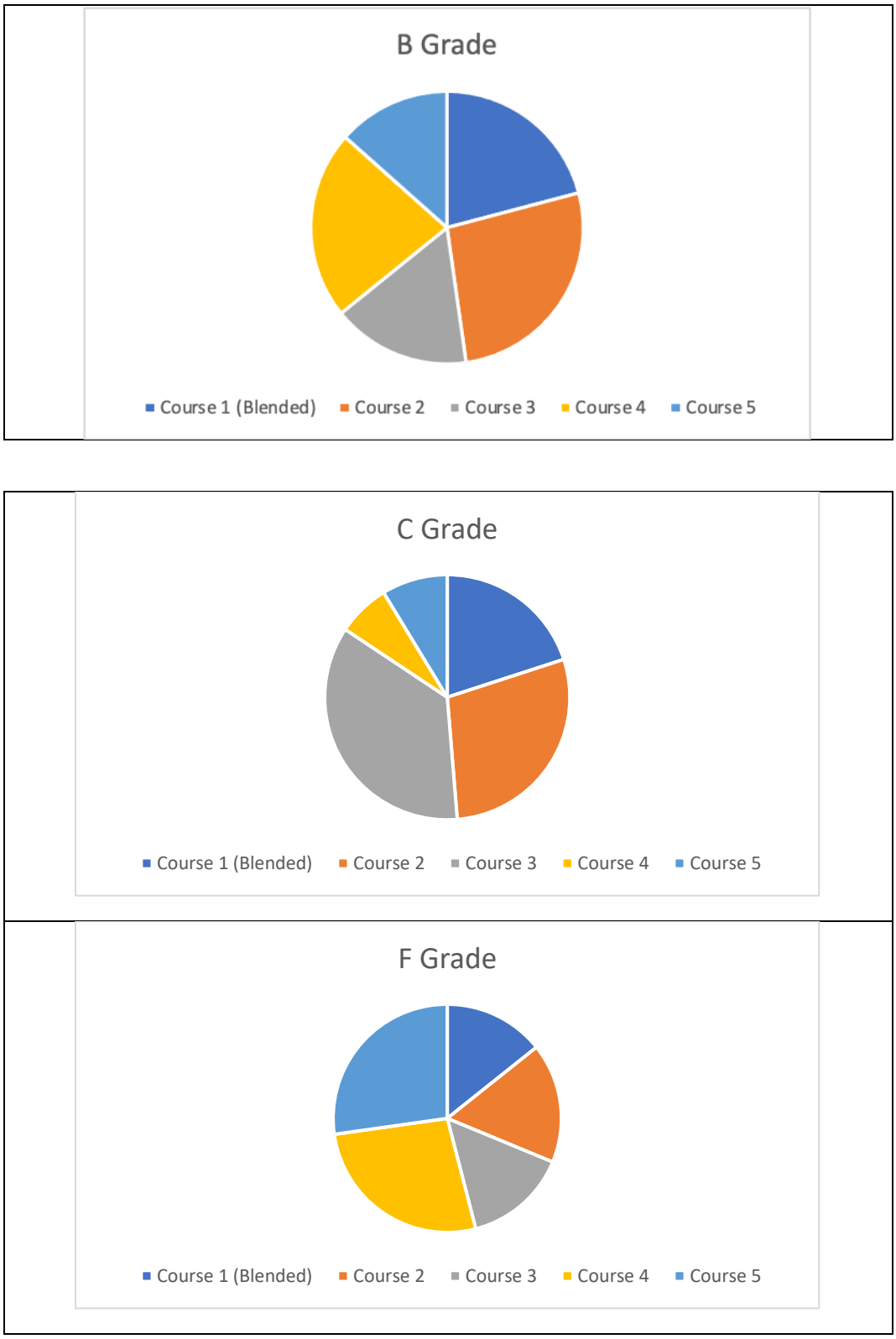


Figure 3: Comparison of grades obtained in blended mode with the traditional mode

3.1 Feedback Survey of Students

The perception of the students was evaluated regarding the use of blended topology of e-learning. The helpfulness of the technology and learning ease was gauged with the help of a questionnaire. The self-administered questionnaire was validated by experts of e-learning. First part of the questionnaire was comprising of demographic variables, while second part was comprising of questions regarding the evaluation of blended e-learning model. Five-point Likert scale was adopted to get the perception of the students (Worst=1, Poor=2, Good=3, Very Good=4, Excellent=5). Statistical Package for Social Scientists (SPSS), and MS Excel were used to manage and analyze the data.

Table 1: Demography of the sample

Variable	**Frequency**	**Percentage**
Gender		
Male	44	62.9
Female	36	37.1
Total	*70*	*100*
Age Group		
Less than 21	06	8.6
21 – 30	39	55.7
31 – 40	18	25.7
More than 40	07	10.0
Total	*70*	*100*
Location		
Urban	35	50.0
Semi-urban	19	27.1
Rural	16	22.9
Total	*70*	*100*
Employment		
Govt. Employee	37	52.9
Private Employee	22	31.4
Unemployed	11	15.7
Total	*70*	*100*

3.2 Demographics

As shown in Table 1, a total of 62.9 percent students were male while 37.1 percent were female. Similarly, most of the students (50.0 percent) were living in Urban while (27.1) were living in semi-urban areas. A total of 22.9 percent students were belonging to rural areas. A good proportion of students enrolled in blended e-learning mode were belonging to semi-urban and rural areas, which is very encouraging that the blended model can be successful in less developed areas. Most of the students were belonging to important professions and were doing jobs in different organizations. Students were satisfied with the flexibility of the blended model. A great majority of students were quite young in age group 21-30. However, as per philosophy of the open and

distance learning education a good representation of old age students can also be observed in table 1.

3.3 Feedback about Pedagogy and Technology

The feedback of the sample students about the pedagogy and technology of the blended e-learning topology is given in the Table 2:

Table 2: Feedback analysis about technology and pedagogy

N=70

Questions	Mean	SD
Was blended e-learning helpful?	3.46	0.93
Did online and blended activities help you in learning?	4.0	0.80
Are you satisfied with indigenously prepared electronic content?	3.77	0.84
How friendly was the website?	3.71	0.87
What is your rating for assessment module?	3.86	1.01
How convenient was the interaction with tutor?	4.14	0.84
Was internet service good?	3.66	1.09
Was communication with class fellows convenient during group discussion?	3.25	1.02
How was the workshop of program?	3.81	0.77
Have you got better grades with blended e-learning?	3.79	0.92
How much is your willingness for more courses in blended mode?	4.20	0.82
How much knowledge and skills you learned with blended system?	3.79	0.90

As shown in the Table 2, students enrolled in blended e-learning topology showed positive response. They also showed satisfaction with the localized content of blended model. The rating given by them to the proposed model was positive as easy and friendly. According to the students, the model is good and helpful learning through online and blended mode and also in preparation of examination. Internet services were convenient. However, students enrolled in the blended model of e-learning were of the view that synchronous discussion needs some improvement. Overall, the students rated the technology as useful for the learning and helpful for attaining better grades. They also showed interest in converting other courses in blended mode.

4. Conclusion and Future Work

This research paper has presented a blended e-learning topology in an open and distance learning environment. The model consists of the elements like development of small re-useable learning objects, delivery of course instructions to distant learners, communication between student and teacher, classroom-based teaching, course assignment, and final examination. As per requirement of the program pedagogy, LMS MOODLE was also customized accordingly, which is the tool for open-source delivery. Similarly, the interaction of the students with the teacher has also been blended in a way to meet the requirement of credit hours, the face-to-face interaction is one third portion of the study period while major chunk is online interaction. The model has been implemented for a selected computer science course of AIOU. The male and female proportion of respondents was also appropriate along with urban, semi-urban and rural background.

The results of the students in the final examination show that the performance of students enrolled in the proposed blended e-learning mode of content delivery was significantly improved as compared to students of same level enrolled in traditional mode of open and distance education (Hoic-Bozic, Mornar, & Boticki, 2009). Furthermore, students were showing great willingness and preference for using the proposed blended e-learning topology. It is worth-mentioning here that the students from different age groups got admission in the blended model and successfully completed the course with improved examination results. Students were found satisfied with localized course content and were also found comfortable (Liyanagunawardena et al. 2014). The access to the localized content was also found easy over the available bandwidth. So, the proposed blended topology of e-learning remained successful in its testing in AIOU. The study suggests that more courses of various discipline should also be brought on blended e-learning mode to facilitate the students and meet the contemporary challenges of open and distance education.

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