DEVELOPMENT OF OPEN AND DISTANCE LEARNING MODEL FOR THE REVIVAL OF DESTROYED EDUCATION SYSTEM IN DISASTER STRUCK AREAS

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Abstract

The paper presents the findings of a study conducted to develop open and distance learning model for revival of education system in disaster struck areas. A random and stratified sample of students of 51 colleges of Azad Jammu and Kashmir and Khyber Pakhtunkhwa has been taken. All available Education faculty members from Allama Iqbal Open University and Senior Management Staff of Earthquake Reconstruction Rehabilitation Authority have been taken as a sample. All levels of 51 colleges were selected. Reliability has been checked through cronbach alpha. Mode, Mean, Median were calculated. The views of heads of formal education institutions and the views of members of faculty of education of AIOU who handle non formal education were taken. The objectives of the study were to identify the magnitude of the problem in education sector and estimate its gravity in relation to financial requirement as well as human resource requirement and to describe the role to be played by AIOU in developing an open and distance learning model in collaboration with formal education representatives. The study has focused on identification of the instructional technology for optimal utilization of Open and Distance Learning (ODL) approaches in post disaster scenario and the effective utilization method / approach which

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can help bringing paradigm shift in prevalent rehabilitation approach being followed the world over. To do so surveys were conducted and the feedback received from target population was evaluated. The frequency and tendency of opinions were calculated. Resultantly, an ODL model has been developed for the early revival of destroyed education system in a disaster struck area.

Keywords: ODL Approaches, Natural Disasters, ODL Practices in catastrophic situations. ODL in emergency situation

Introduction

Tragedy and loss are inevitable in the life of living beings. Human beings are helpless in front of nature, we cannot change it. Earthquakes have killed millions in the past, but man still has not been able to forecast as to when and where theses monstrous waves will strike again. Natural disasters like tsunami, floods, earthquakes, hurricanes wreck the worst kind of damage. They disrupt lives, leave death and destruction in their wake. The affected people, who survive from natural disaster, face hunger, displacement, disease, anger, fear, loss, grief and psychological disorders etc. Man feels helpless in front of such natural calamity. Pakistan faced many natural disasters but earthquake; October 2005 was the biggest natural disaster in the history of Pakistan.

According to Perry (1985) as cited in Saleem (2001), "By nature man is not equipped for life but is equipped with capacities that enable him to learn to live. Education is one of these capacities". Therefore to ensure that there is minimal time loss in imparting knowledge to the students of the affected areas where education system is collapsed as a result of disaster, a need was felt to benefit from open and distance learning mode, of delivering the curriculum of formal education system as well. Education is placed in higher priority in the list of human rights. Hence immediate steps for its resumption within the affected areas must be taken. Open and Distance learning which is swiftly becoming universal in every aspect of education is a beacon during such periods. From elementary education through doctoral programs, information technology enables self-reliant learning through distance. Though some

considerations such as administrative matters involving the hardware, software, and service needed to ensure affective application of the methodology, yet the dividends it pays are enormous.

Looking at the gravity of the damage caused to education system by earthquake of October 2005, the enormity of challenge for its quick revival is evident. Mere facts that it destroyed 5,344 educational instituitions (KPK:2,766; AJK:2,578), killed 18,000 students and 853 teachers/staff's lives. No furniture, Audio Visual Aids and lab equipment remained usable in these institutions. (ERRA, 2007).

A substantial number of teacher, school staff and students suffered from emotional trauma and injuries, and required consulting services. There was a sudden halt in education system due to the natural calamity in the various districts of of AJ&K and KPK.

Quick and early revival of education system becomes the biggest challenge for the Govt under such situations in disaster struck areas. The priority being quick restoration even maintaining the distance between students and teachers is acceptable for the continuity of the formal education curriculum. Hence for the the continuty of educational activities need for adopting the open and distance learning methos, was identified.

Characteristics of Distance Education

Why distance education is being considered as a useful option because it has numerous positive traits. Distance education mode can be implemented in disaster struck areas, its salient characteristics are discussed as under:

Encyclopedia Britannica.com (2012); Galusha (2008); Commonwealth of Learning & ADB (1999) reveal the following features of distance education:

i.   **Spatial and/or temporal separation**: separation of teacher and learner in space (Geographic) and time.

ii. **Institutional Basis**: Learning is done in an institution not by unrecognized self study or in non-academic environment. The institutions many not offer traditional classroom-based instruction

but they are eligible for accreditation by the same agencies as those using traditional methods.

iii. **Use of Mixed Media Courseware**: these include print, radio, TV, video and audio cassettes, computer-based learning and telecommunications.

iv. **Interactive Telecommunications especially between teacher and learner**. Also between student and students forming learning communities. E-mails, calls etc. are used. Social networking media e.g. Facebook, YouTube etc also used.

v. **Possibility of Face-to-Face Meetings**: for tutorials, learner-learner interaction, library study, laboratory/practice sessions/exams etc.

vi. **Use of Industrialized Process**: in large scale ODL operations, division of labour and tasks is used for different aspects of the course.

Use of Media and Technology in Distance Education Universities in Pakistan

A combination of radio, television, and the internet is used in distance education's institutions in Pakistan. According to Iqbal (2010), since 2004, when the government deregulated telecommunication in Pakistan, the sector attracted 54% of the total Foreign Direct Investment. It is estimated that 10,184 hours of programming are broadcast annually on 3.6 million TV sets; the estimates for radio programming are four times this figure.

The use of technology or some learning resources is paramount in distance education as instructions cannot be delivered face-to-face. The Institute of Educational Technology (IET) established in Allama Iqbal Open University as a centre of media production. The educational audio and video content developed in IET is broadcasted on national television and radio channels. The programs for every level of students and courses are recorded and broadcasted at IET, AIOU. The university has its own radio channel, which is a cheap and easily accessible medium comparatively. The live and recorded transmission of AIOU is disseminating knowledge in far flung areas. The use of Media and Technology in AIOU is playing a vital role in distance education. That is to why AIOU possesses a unique approach, being distance learning institution.

In addition to Allama Iqbal Open University, Virtual University (VU) of Pakistan also operates four free-to-air satellite channels on which some of their lectures are broadcasted. VU is also relying on the use of media and technology in its teaching and learning method.

ODL Institutions are Different in their Nature of Openness

There are many different flavors or interpretations of what openness means in education. Due to an ever widening scope of offer, methods and approaches, different ODL institutions differ in their nature of openness and their implementation of distance education. Open learning often includes aspects of e-learning. Following are the salient characteristics of Open education:-

1. **Open Accessibility**: Accessibility may differ between the possibilities to recognize prior learning and work experience as relevant antecedents to end.
2. **Freedom of Time:** Separation of teacher and learner in time or place, or in both time and place. Some ODL courses do however require (online) presence during assignments, group and project work and/or exams.
3. **Freedom of Pace**: Learners are not required to complete a programme of study within a specific time. Instead, learners learn at their own pace and make their own decisions about the learning path that is to be followed for their programme. However, some distance teaching institutions differ in the offers and some programs are more closely paced.
4. **Freedom of Place**: Most learners do not (have to) leave their home or work place as they pursue a programme of study.
5. **Open to People**: There is no restriction of age or gender, education for all, is open.

Open and Distance Learning (ODL)

Open and distance learning is characterized by the following societal expectations:-
- Making education less expensive
- Enabling more people take part in cultural life

- Relieving the overcrowded traditional universities / institutions
- Enabling more people to study while working
- Encouraging lifelong learning
- Making people gain qualifications to enable them survive in today's employment world
- Opening up access to university for students without formal entrance qualifications

EARTHQUAKE 2005 –DISASTER WHICH PROMPTED TO CONDUCT THIS STUDY

MEANING OF EARTHQUAKE
"It is a violent tremor in the earth's crust sending out the series of shock waves in all directions from its place of origin."

The disasters like earthquake disrupt the human lives in all aspects of life. So far there is no system available to forecast the earthquake accurately.

Open and Distance Learning Approaches in Post Disaster Scenario

Once the disasters of mega scale collapse the education system, then the rehabilitation of education system to the level of normalcy would require years. While the Government would like to ensure that even the current education year should not be wasted. By implementing open and distance learning approaches we can save the current education year of the students.

"Emergency and conflict in countries such as Sri Lanka, Pakistan, Haiti and Afghanistan have made us more aware of the long-term serial disruption and psychosocial damage faced by people caught up in emergency and conflict areas. Open, distance and flexible learning (ODFL) has sometimes been employed in these regions to maintain a degree of continuity in education. For the most part, however, this role has been ad hoc, short-term and often bearing limited relation to the psychosocial and educational needs of the displaced or traumatized populations it serves, but remarkable.

Research Methodology

The main objectives of the study were:-
i.   To identify the magnitude of the problem in education sector which is faced by people of Pakistan in post disaster scenario.
ii. To estimate the gravity of the problem in relation to financial and human resources required for recovery.
iii. To describe the role, to be played by AIOU, by developing open and distance learning model for recovery of education system in disaster struck areas.

Population
The population of the study was as follows:-
1.   Senior management Staff of ERRA (12 members)
2.   All 25 academics of faculty of Education, AIOU.
3.   Students of earthquake affected areas
4.   Heads of the rebuilt institutions.

Sampling
100 % ERRA Senior management staff
100 % faculty of education AIOU
100 % Heads of the Institutions

406 students from affected educational institutions. The students were randomly selected during the visit of the institutions. This sample was selected based on the statement that 'beyond the certain point (about N=5,000), the population size is almost irrelevant and a sample size of 400 will be adequate'. (L.R.Gay, 2009).

Reconstructed Schools/Colleges in Distt Mansehra and Muzzaffarabad
Total Higher Secondary Schools (HSS):   **30**
Sample Size: **26** (87 % of the total restored HSS)
Total Colleges: **28**
Sample Size: **25** (89 % of the total restored colleges) (ERRA, 2011)

Procedure

The study was descriptive in nature. In order to conduct the study, following procedure was adopted. The study consisted of two phases. In the first phase, researcher explored the relevant literature, and studied the nature and components of distance education and destruction caused by the natural disaster in education system in Pakistan. The researcher focused on the district Mansehra and Muzaffarabad. In the second phase researcher designed four questionnaires for each group: 1) The ERRA officials; 2) Heads of the Institutions of the above two districts; 3) The students of affected areas; 4) Education faculty, AIOU. One separate questionnaire was developed for each group of population. The validity and reliability of the tool was measured during pilot testing. The panel of five experts from distance education, ERRA management staff, Heads of institutions and affected students validated the questionnaires. After pilot testing the mid course corrections were done. The questionnaires were sent through post as well as by hand to collect the relevant information. Data was collected by the researcher. After the collection of data, it was tabulated on computer. Then the tabulated data in SPSS was analyzed by applying formulas of percentage and measures of central tendencies.

INSTRUMENTATION

Five Point Likert Scale

(i) Total score of each item was calculated.

(ii) Mean score of each item was calculated.

Following scale was used to calculate the mean score:-

- SA= Strongly Agree   5 Points
- A=   Agree   4 Points
- N=   Neutral   3 Points
- D=   Disagree   2 Points
- SD= Strongly Disagree   1 Ponit

Mode, Mean, Median were calculated based on collected data which was collected through questionnaires. The opinion of educationists representing Formal education and Non Formal Education was taken in light of faculty of education, AIOU formal education and Non formal education was taken in light of faculty of education, AIOU and Formal educations' heads of institutions' opinions about application of open & distance learning in collaboration with formal education to recover

education system in a disaster struck area. The reliability factor of the received data has been checked through Cronbach's Alpha test.

Statistical Analysis

Table 1
Reliability Statistics of Faculty Members Data

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
.914	**.928**	**56**

Table 1 is showing the result of cronbach's Alpha score on 56 items of the questionnaires received from faculty members AIOU.The score .928 shows the data is very reliable.

Table 2
Reliability Statistics of Heads of Institutions Data

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.757	**.817**	**56**

Table 2 is showing the result of cronbach's Alpha score on 56 items of the questionnaires received from Heads of the Institutions. The score .817 also shows that the data is reliable.

Table 3
Reliability Statistics of ERRA Management Staff Data

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.807	**.683**	**32**

Table 3 is showing the result of cronbach's Alpha score on 32 items of the questionnaires received from ERRA management. The score .683 shows the data is reliable.

Table 4
Reliability Statistics of Students Data

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.583	**.612**	**16**

Table 3 is showing the result of cronbach's Alpha score on 16 items of the questionnaires received from students. The score .612 shows the data is satisfactory.

Table 5
Analysis of the Common Responses to all four Categories of Respondents

S. No.	Statement	Faculty (Mean)	HOI (Mean)	ERRA (Mean)	Students (Mean)	Average (Mean)
1	Earthquake 2005 caused very severe destruction in education sector and continuity of education.	-	4.52	4.67	4.11	4.5
2	After any natural disaster, it always required enormous financial resource for recovery of educational infrastructure.	4.55	4.46	4.83	-	4.6
3	Application of ODL method can help resuscitating the paralyzed educational infrastructure due to natural disaster in future.	4.15	4.52	4.5	-	4.39
4	AIOU should develop exclusive courses in collaboration with educational boards for revival of education in disaster struck areas.	4.75	4.46	4.58	-	4.6
5	Open and distance learning method is economical for disaster affected people.	4.11	4.5	4	-	4.2
6	Open and Distance learning approach is the best method of education in disaster struck area.	3.55	4.2	4.25	-	4
7	Technology of Radio is easy and accessible in disaster struck areas while adopting ODL approach.	4	3.5	4.1	-	3.8
8	Print media of newspaper is useful in ODL approach for timely knowledge.	4	4	3.6	-	3.9
9	ODL approach is easy and accessible for the affected people.	4.5	4.4	4	3.5	4.1
10	AIOU should adopt an effective local delivery system in affected areas.	4.1	4.2	4.5	-	4.2
11	AIOU should train people through open and distance ucation to combat this challenge in future.	4	3.6	3.5	-	3.7
12	Technology of Mobile is easy and accessible in disaster struck areas while adopting ODL approach.	4.6	4.5	4.1	-	4.4
13	Print media of flyers is useful in ODL approach for timely knowledge.	4.5	4.1	4.4	-	4.3
14	After disaster, quick recovery of paralyzed education system is possible through Formal Education.	2	1.2	2.4	-	1.8
15	AIOU played any role in earthquake 2005, for recovery of education system.	0	1.00	0	-	1.00

*AIOU: Allama Iqbal Open University
*ODL: Open and Distance learning

Results

1. Average score of the mean of three from the all respondents is 4.5. ERRA (Mean = 4.67), Students of affected areas (Mean= 4.11) and Heads of the Institutions (Mean=4.52). So they supported that the Earthquake 2005 caused very severe destruction in education sector and continuity of education.

2. Average score of the mean of the three respondents is 4.6 which show all of them supported that after any natural disaster, it always required enormous financial resource for recovery of educational infrastructure. In ODL method there are less financial and human resource are used, so this is better to adopt comparatively.

3. ERRA (Mean = 4.5), Faculty (Mean= 4.15) and Heads of the Institutions (Mean=4.52). Average score of the mean of the three respondents is 4.39 which show all of them supported the application of ODL method can help resuscitating the paralyzed educational infrastructure due to natural disaster.

4. ERRA (Mean = 4.58), Faculty (Mean= 4.46) and Heads of the Institutions (Mean=4.75). Average score of the mean of the three respondents is 4.6 which show all of them supported the AIOU should develop exclusive courses in collaboration with educational boards for revival of education in disaster struck areas.

5. ERRA (Mean=4.0), Faculty (Mean=4.11) and Heads of the Institutions (Mean=4.5). Average score of the mean of the three respondents is 4.2 which show all of them supported the Open and distance learning method is economical for disaster affected people. People can afford it as it is flexible study in terms of time, cost, place etc.

6. ERRA (Mean = 4.2), Faculty (Mean= 3.55) and Heads of the Institutions (Mean=4.2). Average score of the mean of the three respondents is 4 which show all of them supported the Open and Distance learning approach is the better method of education in disaster struck area in comparison with other modes of education.

7. ERRA (Mean = 4.1), Faculty (Mean= 4.0) and Heads of the Institutions (Mean=4.5). Average score of the mean of the three respondents is 3.8 which show all of them supported the technology of Radio is easily accessible in disaster struck areas while adopting ODL approach, as radio technology is important tool of ODL method.

8. ERRA (Mean = 3.6), Faculty (Mean= 4.0) and Heads of the Institutions (Mean=3.6), and students (Mean= 4.5). So average score of the mean is 4.1 of all four respondents which show all of them supported the Print media of newspaper is useful in ODL approach for timely knowledge.

9. ERRA (Mean = 4.0), Faculty (Mean= 4.5) and Heads of the Institutions (Mean=4.4). Average score of the mean of all four respondents is 4.1 which show all of them supported the ODL approach is easy and accessible for the affected people in comparison with other approaches.

10. ERRA (Mean = 4.2), Faculty (Mean= 4.1) and Heads of the Institutions (Mean=4.2). Average score of the mean of the three respondents is 4.2 which show all of them supported the AIOU should adopt an effective local delivery system in affected areas.

11. ERRA (Mean = 3.5), Faculty (Mean= 4.0) and Heads of the Institutions (Mean=3.6). Average score of the mean of the three respondents is 3.7 which show all of them supported the AIOU should train people through open and distance education to combat this challenge in future.

12. ERRA (Mean = 4.1), Faculty (Mean= 4.6) and Heads of the Institutions (Mean=4.5). Average score of the mean of four respondents is 4.4 which show all of them supported the Technology of Mobile is easy and accessible in disaster struck areas while adopting ODL approach.

13. ERRA (Mean = 4.5), Faculty (Mean= 4.4) and Heads of the Institutions (Mean=4.1). Average score of the mean of the three

respondents is 4.3 which show all of them supported the Print media of flyers is useful in ODL approach for timely knowledge.

14. ERRA (Mean = 4.1), Faculty (Mean= 2.4) and Heads of the Institutions (Mean=1.2). Average score of the mean of four respondents is 1.8 which shows all of them did not support the after disaster; quick recovery of paralyzed education system is possible through Formal Education.

15. ERRA (Mean = 0), Faculty (Mean= 0) and Heads of the Institutions (Mean=1.0). Average score of the mean of four respondents is 1.00 which shows all of them did not support that the AIOU played any role in earthquake 2005, for recovery of education system.

Conclusion and Discussion

The study was designed to develop open and distance learning model for the revival of education system in disaster struck areas. The study was delimited to the students and heads of the educational institutions of the two (affected by earthquake 2005) districts e.g. Muzaffarabad and Mansehra. Also the Management staff of Earthquake Reconstruction and Rehabilitation Authority HQ Islamabad, AJ&K and KPK as well as all the education faculty members of AIOU. Researcher having experience of more than four years in ERRA for rehabilitating affected people, also given the recommendations.

The data was collected through the above respondents through questionnaires and interview of some of the ERRA staff. The questionnaires were based on five point likert scale for highlighting the opinion about the magnitude and gravity of the problem and describing the role of AIOU in recovery of education system. The psychometric response is taken to ascertain the degree of opinion from the experts of formal and non formal education system's personnel. Hierarchy of opinion helped in developing the ODL model for formal system of education. To get more opinions open ended questions are incorporated in it.

The data collected through the questionnaires was tabulated in SPSS and analyzed through calculating the percentage and mean score

responses. The main findings were made on the bases of calculation and answers to the research questions. According to these findings the natural disaster brought huge devastation in the affected areas particularly in education. The estimation of the gravity is in terms of financial resources and human resources is gigantic. AIOU probably can play significant role in recovery and rehabilitation of the education system by its unique approach and delivery system of education in affected areas. On the basis of the responses' analysis the use of print media, electronic media as well as mass media researcher develop ODL model for the cause of recovery of education system by using the optimal utilization of technology, as technology is the basic factor of distance education.

Description of ODL Model

This model which can be implemented during any natural disaster and emergency, its processes' steps are given below:-

The ADDIE model is the standard process traditionally used by instructional designers and training developers. The ODL model is based upon five steps of ADDIE model, stated above.

Analysis

As per the model given above, there will be analysis of the following:-
* The targeted audience and their characteristics.
* Learning constraints those are existed.
* The mode of delivery options.
* The online teaching considerations.
* The timeline for project completion.

Design

Design of instructional, visual and technical design strategy will be there as it is given in the model.

Development

The development phase is where the developers at AIOU will create and assemble the content assets that will be created in the design phase.

Course coordinator will work to develop and/or integrate technologies. Revision process will be done.

Implementation

The course is revised and then will be implemented.

Evaluation

In open and distance learning, the formative evaluation will be on every stage and summative on completion of course. Summative evaluation will consists of tests designed for domain specific criterion-related referenced items and providing opportunities for feedback from the users.

Further Recommendations

On the basis of these conclusions, following recommendations are given below:-

1. For disaster struck area, in order to continue education Open and Distance learning material should be developed.
2. Open and distance learning curriculum should be based on formal education curriculum.
3. Teachers should be trained to reduce the risk of loss caused by the natural disaster.
4. Open and Distance learning method should be implemented by Educational authorities in   case of conflicts, emergency and natural disaster.
5. In post disaster situation there should be special fee concession for affected people.
6. Regional offices of AIOU should immediately launch course, previously developed to save the precious time of students in affected areas.
7. For knowledge sharing and timely dissemination of news, there should be collaboration of Mobile companies and AIOU (for introducing packages of low rates)
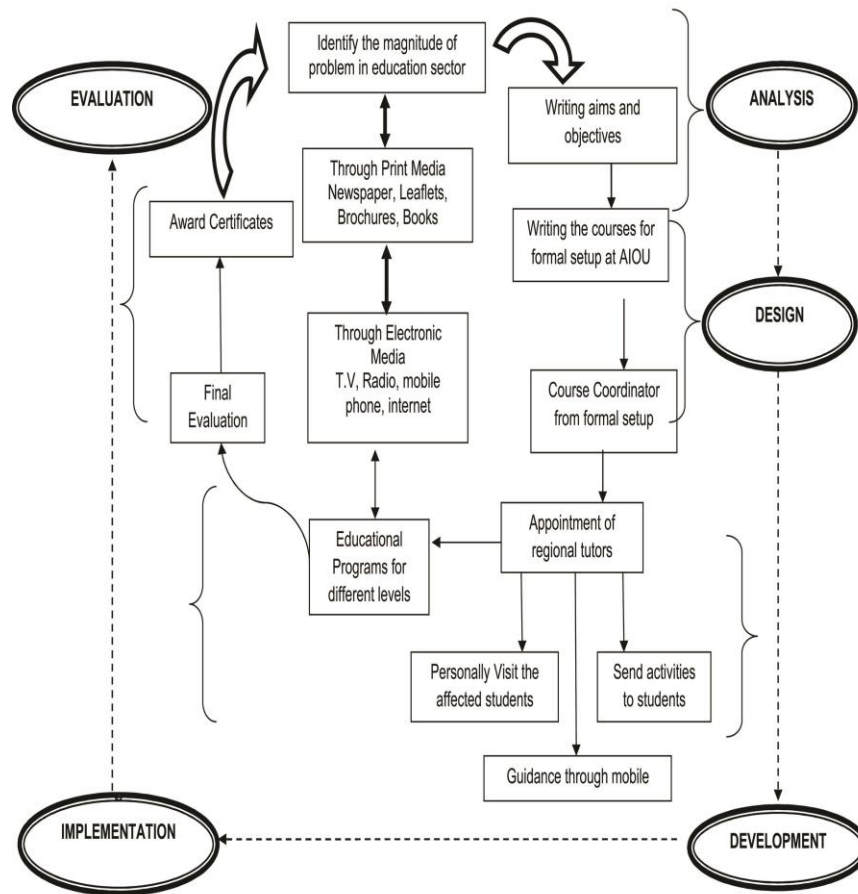
Proposed Model

Figure 1. Shows Description of ODL Model

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